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Contents

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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.

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PUBLICATIONS

Each year members receive four issues of the *Kansas Anthropological Association Newsletter* (ISSN 1069-0360) and one journal, *The Kansas Anthropologist* (ISSN 1069-0379). They also receive six issues of *Kansas Preservation*, the newsletter of the Cultural Resources Division of the Kansas State Historical Society. All members and interested individuals, professional or amateur, are invited to submit material to the editors for use in these publications. 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.

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NOTES

"A Country Far Removed from the Civilized World:" The 2001 Kansas Archeology Training Program in Independence Creek Valley, Northeastern Kansas

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The Kansas Anthropologist 24:1-33

Over a two-week period in June 2001, the Kansas Anthropological Association (KAA), with the assistance of archeologists from the Kansas State Historical Society, conducted the Kansas Archeology Training Program (KATP) in Atchison and Doniphan counties in northeastern Kansas. The program entailed surface surveys, shovel tests, and limited test excavations at selected sites in the Independence Creek watershed, a tributary system of the Missouri River. As a result of the program, 81 sites were investigated in that area (7 others were recorded in other drainages in Doniphan County). In combination with 35 previously recorded sites that were not investigated by the KATP participants, the total number of archeological sites in the watershed is now 116. These sites include components of the Archaic, Woodland, Late Prehistoric, Protohistoric, and Historic periods and occur in a variety of lowland and upland settings. This article summarizes the investigations done at KATP sites and their artifact assemblages. Particular attention is given to their suggested cultural-temporal affiliations and landscape contexts as they increase understanding of the human prehistory of the lower Missouri Valley in northeastern Kansas.

The Plains of this countrey are covered with a Leek Green Grass, well calculated for the sweetest and most norushing hay- interspersed with Cops of trees, Spreding ther lofty branchs 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 by the variety of flours Delicately and highly flavered raised above the Grass, which Strikes & profumes the Sensation, and amuses the mind throws it into Conjecterng the cause of So magnificent a Senery in a Country thus Situated far removed from the Sivilised world to be enjoyed by nothing but the Buffalo Elk Deer & Bear in which it abounds & Savage Indians.

-William Clark, July 4, 1804
(Moulton 2003:17-18)

As the words of William Clark suggest, the rich resources of the Missouri River in northeastern Kansas and those of its tributary Independence Creek in particular have long attracted native populations. Indeed, they have been a magnet to diverse cultures far longer than Lewis and Clark and their Corps of Discovery imagined when they camped near present Doniphan after firing a cannon in commemoration of the nation's birthday and naming the nearby stream in

its honor. During the waning years of the century that began shortly before Lewis and Clark explored the Missouri River, traces of prehistoric occupation of Independence Creek valley were reported in newspaper articles and regional histories (see Previous Investigations below). Through the twentieth century, archeological investigations in the valley included excavations of a few selected sites, such as Doniphan (14DP2), a few professional surveys of small tracts, and informal surveys by local amateur archeologists. Still, that century closed without a major archeological survey of the valley. However, a new millennium dawned, and it brought plans by the Kanza Chapter of the Kansas Anthropological Association (KAA) and the Atchison Lewis and Clark Bicentennial Planning Committee to celebrate the anniversary of the Lewis and Clark Expedition. As a prelude to that celebration, members of these organizations invited the Kansas Archeology Training Program (KATP) to explore the valley in order to more thoroughly document its prehistoric and historic occupation. This article summarizes the findings of that project.

Over a 16-day period in early June 2001, the KAA and professional archeologists from the Kansas State Historical Society (KSHS) conducted the KATP field school in Atchison and Doniphan counties, northeastern Kansas. They focused on the Independence Creek watershed, which drains an area of about 164 mi^2, including much of the city of Atchison and the village of Doniphan. The KAA's Kanza Chapter, host of the 2001 KATP, received support from other local organizations, including the Atchison County Historical Society, Atchison Chamber of Commerce, Atchison Preservation Alliance, Benedictine College, Atchison YMCA, local school systems, the Native American Heritage Museum State Historic Site, Doniphan County Historical Society, and Doniphan County Economic Development Commission (Wulfkuhle 2001). The author was contracted by the KAA to complete a report of the project, as well as other tasks, through funding from the Courtney S. Turner Charitable Trust.

Others have written summary accounts of the 2001 KATP or portions of it (Conrad 2001; Feagins 2001; Keck 2001; Logan and Banks 2001). Here I provide a more comprehensive description of data collected by the survey crews, including descriptions of selected sites and diagnostic artifacts recovered. For a more comprehensive account of the project findings, the reader should consult the final report submitted to the KAA and the KSHS (Logan 2003c). It includes a spatial description of the sites within the Independence Creek watershed in a Geographic Information System (GIS) format that presents site locations too detailed to be included here.

My interest in the KATP project reflects long-term, ongoing research into the prehistory of the lower Missouri Valley (also known as the Kansas City locality). It was initiated in 1978-1979 when I directed a survey of the environs of Kansas City International Airport (Logan 1979). I then became acquainted with the general outline of the prehistory of the lower Missouri and developed a particular interest in the ceramic periods (ca. 500 B.C.-A.D. 1500). Subsequently, I conducted more extensive surveys and site excavations in Stranger Creek basin, the last major drainage of the Kansas River (Logan 1981, 1983). These increased my familiarity with and interest in the regional culture history and formed the basis of my doctoral dissertation (Logan 1985). I then directed surveys and excavations at Clinton and Perry Lakes (Logan 1987a, 1990a; Logan and Fosha 1991) and along smaller tributaries of the lower Kansas River in Leavenworth, Wyandotte, and Johnson counties (Logan 1987b, 1988a, 1990b; Logan and Hedden 1993). I also directed extensive excavations through field schools and cultural resource management projects along tributaries of the Missouri River near Atchison (Logan 1986) and Fort Leavenworth (1993, 1998).

I was particularly intrigued with the opportunity to compare the archeology of the Independence Creek and Stranger Creek watersheds, which share an interfluve in Atchison County. A common factor of surface surveys in both areas was their opportunistic nature. While time limitations, landowner consent issues, and financial constraints precluded application of systematic sampling, these surveys resulted in discovery and documentation of hundreds of sites across a range of landforms. Discoveries in these areas not only lay the framework for more extensive investigations, but they also provide a basis for understanding prehistoric settlement patterns and site preservation or burial throughout the Holocene.

Previous Investigations

Independence Creek was one of the first in the state to be explored archeologically, though in a manner that left much to be desired from a professional view. From the 1890s through the 1920s, many prehistoric sites in the Lower Missouri Valley were subjected to non-systematic excavations. More scientific exploration could not have been expected, given the near infancy of archeology in North America at that time and the absence from the region of any well-

trained members of that discipline. George Remsburg, Mark Zimmerman, and Ed Parks, three of the most active amateur archeologists of the time, carried out numerous surveys and uncontrolled excavations in the vicinity of Atchison and Doniphan. Remsburg alone was said to have investigated "more than a hundred" sites and mounds along the Lower Missouri Valley, most of them in Doniphan, Atchison, and Leavenworth counties (*Troy Kansas Chief* 1954). Remsburg, a journalist, described in often frustratingly imprecise and florid prose accounts of his digs in various newspapers and other outlets in the region. Zimmerman, a farmer, published speculative interpretations of his finds in KSHS publications. Parks was his frequent collaborator during explorations. Remsburg left his extensive collection of artifacts to Zimmerman, who in turn gave his augmented collection to the KSHS. Both men also donated material to the Smithsonian Institution and the Peabody Museum of Natural History.

Through their accounts and collections, these amateurs aided later professionals by providing information about the nature of the sites, mounds, and artifacts and their general locations. They were helpful guides and informers to F. H. Sterns, director of the Harvard Expedition to the Lower Missouri Valley in 1915, and Gerard Fowke of the Smithsonian Institution, Bureau of American Ethnology, who conducted a survey of the region at about the same time. The Sterns and Fowke surveys were the first professional archeological investigations in the region. As a result of his sojourn along the lower Missouri Valley, Sterns defined the "Rectangular Earth Lodge Culture," now known as the Nebraska phase of the Central Plains tradition (Wedel 1959:95-96).

Remburg's writings in newspaper articles, journals, self-published pamphlets, and regional histories are of some use (Logan 1985:154-158). His research on the Doniphan site and identification of it as the Kansa village visited by the French explorer Etienne Veniard de Bourgmont in 1724 (Remsburg 1919) is generally accepted as accurate, in part if not in whole (i.e., this bluff-top site may have been burial grounds associated with a village located in the nearby valley [Wedel 1959]). According to Wedel (1959:94), "the numerous short statements published by [him] contain leads that would still repay follow-up work."

Zimmerman's writings about his work with Park, on the other hand, are not as thorough or informative as Remsburg's. Wedel (1959:97) aptly says, "they contain ... a great deal more chaff than grain." His treatises exclude any useful information he might have imparted in favor of bizarre inferences about regional history. They mingle the developments of American Indians, some "red" and others "white" or Welsh, with references to Druids, Celts, Mormons, Hebrews, Freemasons, and even Neanderthals (Zimmerman 1925). Zimmerman was not alone with respect to his beliefs about Welsh influence in the prehistory of the American Indian. Others held such ideas during the eighteenth and nineteenth centuries, and a few people continue to propound such outlandish, unsupportable ideas. His writings are examples of what is today called "fantastic" or "cult" archeology.

In most cases the random nature of the work of these excavators—their lack of controlled field methods, failure to fully document their findings, and unfounded interpretations of culture history—did not contribute significantly to modern archeological research. It was their professional successors, such as Wedel, who eventually brought disciplined field methods and sound interpretations to the investigation of human prehistory in northeastern Kansas. Wedel's excavation in 1937 at the Doniphan site, on a bluff above the village of Doniphan and Independence Creek valley, was an example of the direct historical approach, an attempt to use archeological evidence to trace connections from specific historic American Indian groups to their prehistoric ancestors (Wedel 1959:98-130). At Doniphan he uncovered the remains of two houses, both of which he assigned to an earlier occupation of the site by groups of the Central Plains tradition (Late Prehistoric period), as well as a series of cache pits and burials that he tentatively identified as Kansa. Wedel suggested the latter finds supported Remsburg's identification of the Doniphan area as the location of the Kansa village from which de Bourgmont began his westward trek to the "Padouca" (i.e., the Plains Apache). The goal of his sojourn, a diplomatic mission, was to woo the Indians from the Spanish in order to enhance trade with his own country.

As a research design for that portion of the KATP field school focused on the Doniphan site environs, Martin Stein (2001a) reviewed references to artifact finds there that had been compiled by Remsburg (Gray 1905:151-153). Based on his review of those accounts, historical maps, and subsequent investigations (i.e., Bass and Nelson 1968; Rogers 1988; Sturdevant 1988; Thies 1989; Willey and Bass 1969; Witty 1964), Stein (2001a:19-20) identified potential areas in the village of Doniphan for archeological test excavations. These included the area south of the old Doniphan school, a field south of Fifth Street, and the public square. The results of KATP explorations in these areas are described in the appropriate section below.

It is apparent in the Father Felix Nolte Collection

that many sites in the area around Atchison and Doniphan have been subject to informal, yet undoubtedly extensive, surface artifact collecting. This collection, consisting of 5,000 historic and prehistoric artifacts, was acquired by the Benedictine College Museum in Atchison over many years through the donations of local avocational archeologists and collectors. They were obtained and catalogued by Father Nolte, the museum director, and Father Eugene Dehner, his successor. In 1994 the collection was deaccessioned from Benedictine and donated to the Museum of Anthropology, University of Kansas (KUMA) in Lawrence. It includes hundreds of chipped stone tools and a smaller number of ground stone tools representing every major period of prehistory in the region. In 1996 I served as co-curator with Professor Alfred E. Johnson, then Director of KUMA, of an exhibit of selected artifacts from the collection. During our review of the collection's original catalogue, we noted that it often provided the name of the landowner and occasionally the legal coordinates of the area where the artifacts were found. I reviewed the collection again in preparation for a class on Northeast Kansas Prehistory that I taught during the 2001 KATP and brought examples of artifacts for each time period to the class, including some that may well have come from sites surveyed during the KATP project. More thorough pursuit of site leads in the Nolte Collection catalogue is beyond the scope of my research. However, such detailed review to compare provenience information with that of KATP-recorded sites would undoubtedly be fruitful. It probably also would underscore the fact that artifact collection in the Independence Creek area has impacted many of these sites.

Field Methods

Survey

Field methods employed during the KATP field school included pedestrian reconnaissance of varied terrain in the Independence Creek watershed and test excavations at selected sites therein. Tracts surveyed were chosen based on accessibility, surface visibility (with some exceptions), and perceived potential for containing archeological materials. In other words, tracts were chosen opportunistically, not systematically. The project area was not sampled statistically, and for that reason interpretations of site distributions in the watershed are biased toward terrain with preconceived greater potential for site discovery. For example, the lower portions of the Deer Creek and Independence Creek valleys and adjacent uplands received far more attention than the upper reaches of these drainages. The archeological potential of the latter areas remain largely unexplored. Despite the skewed sample of the watershed, the KATP survey greatly enhanced the documented record of Independence Creek, and the information obtained provides the basis for fruitful comparison with other regional surveys.

The KATP findings were obtained through a relatively narrow window of opportunity. Of the 16 days set aside for the project, some were lost to inclement weather. While tilled fields and other areas of good visibility were frequently selected for inspection, some grassy areas were surveyed and shovel tested. The intervals between survey transects and shovel tests varied from team to team. Where I was supplied with relevant information, it is apparent that distances between transects varied. In some cases, crop rows were used to separate individuals by about one meter (Stein 2001b). Transect intervals on teams directed by State Archeologist Robert Hoard (personal communication 25 June 2001) were 5 m, with shovel tests excavated every 10 m, although this admittedly was "the ideal," and survey transects sometimes ranged toward 10 m. Another constraint on survey teams was the need to return from the field to Atchison during the noon hour. Team composition often changed at that time, as well as from day to day, with consequent changes in the number and relative experience of team members among nearly all crews. The following persons served as survey team leaders throughout part or all of the KATP field school: KSHS archeologists Tod Bevitt, Robert Hoard, Martin Stein, Randall Thies, Timothy Weston, and Virginia Wulfkuhle; and private archeological consultant Jim Feagins. All of these persons supplied the author with copies of USGS topographic maps showing the areas surveyed and sites located; most of them also provided a summary account of or reflections on their investigations.

The author has also benefited from KATP accounts by KAA Historian Mary Conrad (2001) and Virginia Wulfkuhle (2001), and here I summarize some of their statistics. A total of 154 persons participated in the project for periods that ranged from a single day to the duration of the KATP field school, devoting 3,160 hours to survey and test excavations. The crew led by Hoard surveyed 120 acres during the first week but found only two sites. Fortune improved during the second week when this crew found 17 sites. Bevitt's crew found 11 sites, including an historic bottle cache, ably described and interpreted by Dick Keck (2001). During the first week of the project,

Feagins' crew surveyed 100 acres on two farms, documenting surface finds at one previously recorded site and finding seven others (compare Feagins 2001). Weston replaced Feagins for the second week of the project, and under his direction the crew surveyed three tracts (Weston 2001), finding six sites in one, two in another, and none in the third. The survey crew under the direction of Stein and Wulfkuhle found four sites in upland areas. Stein led another crew during the second week of the project that found one site and further documented the extent of two that had been previously recorded. Finally, a small crew under the direction of Thies (2001) followed two local informants, Paul Roberts and John Rush, to promising areas not only in the Independence Creek watershed but northward to the area drained by the Wolf River. They recorded 29 new sites and inspected 2 others that had been recorded by previous investigators. This article focuses only on those sites found by Thies in the Independence Creek drainage.

Testing

One of the goals of the KATP field school was to test excavate targeted sites in order to determine their eligibility for nomination to the National Register of Historic Places (NRHP). A major potential target for this work was the Doniphan townsite (14DP390), located near the Doniphan site (14DP2), where evidence of Late Prehistoric (Nebraska phase) and historic Kansa activity had been recovered during previous investigations (Rogers 1988; Wedel 1959). Unfortunately, thorough pedestrian reconnaissance, shovel testing, and surface artifact mapping did not indicate any subsurface potential, so the planned testing did not occur. Similar work at 14DP422, a locality of Late Prehistoric (Nebraska phase) activity within the greater Doniphan townsite (and comparable to an area within 14DP2 called 611; T. A. Witty, KSHS site file), suggested some potential for subsurface deposits. However, excavation of a single 1 m^2 unit to a depth of 25 cm did not reveal any.

Four sites (14AT438, 14AT444, 14AT445, and 14AT448) were more extensively tested. Robert L. Thompson of Atchison, a member of the Kanza Chapter, had recorded all of these previously. In his search for evidence of the Kansa village noted by Clark (Moulton 1986; Thompson and Reichart 1993), Thompson had found numerous prehistoric sites in the Independence Creek area. KATP testing focused on both upland and lowland sites with preceramic or ceramic-age components that appeared to have National Register potential. Testing at each site was preceded by intensive surface survey to locate areas of greater artifact density that might mark buried deposits with some integrity. Subsequent testing entailed excavation of 1-m^2 units that were excavated in 10-cm levels. On occasion some contiguous units were dug in order to reveal a greater area. Fill was generally dry screened through ¼-inch mesh hardware cloth, though sometimes it was shovel-scraped in thin sheets. I was provided with the field notes, unit and feature forms, and photographs of these investigations.

KSHS archeologists also supplied me with maps of tested sites, as well as those of three surface-mapped sites in the uplands northeast of the Doniphan site (14AT423, 14AT424, and 14AT425). Topographic and artifact location data at each had been collected with a Topcon 211D Total Station with a Tripod Data Systems (TDS) 48GX data collector. TDS SurveyLink software was used to download and edit points from the data collector and TDS Foresight was used to draft site maps. An Electronic Distance Measure (EDM) was established over a temporary datum at all sites (Martin Stein, personal communication 11 February 2003). Copies of these maps are included with the final project report.

Appended here is a list of all sites in the Independence Creek watershed, including eight sites that are just downstream of the tributary and closer to the Missouri River. An asterisk denotes the sites investigated during the KATP field school. Other data included are suggested temporal affiliation(s), topographic context, and associated drainage. The reader will not find here a site distribution map. This was omitted to preserve the confidentiality of site locations for landowners and to prevent vandalism or pothunting. The final project report includes a compact disk (CD) with the following: GIS data from the Data Access and Support Center (DASC) at the Kansas Geological Survey for all sites in Independence Creek watershed; a Digital Elevation Model (DEM) map of Independence Creek watershed with all GIS site polygons, one labeled with site numbers and another without labels; DEM maps of generalized site locations for all archeological sites and for each of the general temporal periods (Archaic, Woodland, Archaic/Woodland, Woodland/Late Prehistoric, Late Prehistoric, Unknown Prehistoric, and Historic); a topographic map derived from the two USGS topographic quadrangles that cover the project area on which the GIS site data can be layered; and a one-minute "flyover" video that shows site polygons projected on a three-dimensional topographic drape over aerial photographs of the watershed. Hard copies of all DEM maps also accompany the final report.

These data will be available to qualified researchers. I am grateful to Joshua S. Campbell, graduate research assistant at the Department of Geography, University of Kansas, for plotting the site locations in a GIS environment and providing the CDs.

Independence Creek Watershed

Independence Creek drains an area of approximately 425 km^2 (164 mi^2) in Atchison and Doniphan counties. The trunk stream flows southeast to the Missouri River, a linear ("as the crow flies") distance of approximately 20 km. Its principal tributary, Deer Creek, courses east-northeast a linear distance of 13.7 km to join its parent stream just at the floodplain of the Missouri River. One interpretation of the Lewis and Clark journals by two local amateur archeologists, with reference to the explorers' descriptions of the Independence Creek area, proposed that Deer Creek was the one dubbed "4th of July 1804 creek" (Thompson and Reichart 1993). Thompson and Reichart (1993:4) suggested that Deer Creek was not then tributary to Independence Creek but had been pirated by a westward meander of the Missouri River. Presently, however, Deer Creek flows into Independence Creek just upstream from the latter's southward course between the Missouri River bluffs and a manmade levee.

The project area is within the Dissected Till Plains of Kansas. Its topography is characterized by steep loess bluffs along the Missouri River and the lower reaches of its tributaries and in the uplands beyond by gently rolling hills (Schoewe 1951). Elevation in the drainage ranges from 240 m (780 ft) above mean sea level (amsl) at the confluence with the Missouri River to 350 m (1140 ft) amsl in the uplands (e.g., 3 km east of Bendena). Most of the steeper bluffs along lower Independence and Deer Creeks are about 46 m (150 ft) above the valleys. The Dissected Till Plains were affected by Pleistocene glaciation. Early ice advances (Kansan and Nebraskan in the old four-stage glacial scheme) reached the area and, upon retreat, left till deposits. Native populations made use of the varied metamorphic rocks carried by the ice from regions well to the north. Quartzites, diorites, greenstones, and granites were utilized for a variety of ground stone tools, including manos, metates, mullers, axes, celts, and hammerstones. Ferrous oxides (hematite and limonite) in the till deposits served as sources of pigment. The current topography reflects late Pleistocene (Wisconsinan in the four-stage sequence) deposition of windblown silt (loess) from the glacial outwash floodplains.

The exposed bedrock geology is Pennsylvanian in age. Among the many members of the Virgilian Stage that includes the project area is the Plattsmouth limestone, which offers readily available nodules of gray, fossiliferous chert used for chipped stone tools (Logan 1988b; McLean 1998). Permian-age outcrops with chert-bearing limestone members are found in the Flint Hills about 100 km west of the Independence Creek watershed. That these were exploited during westward forays or through trade with local groups is evident in several chipped stone tools of that material in KATP site assemblages.

Oak-hickory woodlands were the dominant natural potential vegetation of Independence Creek watershed along the valleys and the bluffs adjacent to the major streams. Tallgrass (bluestem) prairie was the principal vegetation in the uplands. The Missouri River and its floodplain offered a varied aquatic community of sedge, willow, cottonwood, and other softwoods (Kuchler 1972). Accounts of early explorers, such as Lewis and Clark, confirm that these biomes were rich in various animal species. Testimony to their exploitation by Native Americans is found in the faunal assemblages from their excavated occupations (Wedel 1959:118-119, 142-143; compare Ruppert 1974). Among animals represented are white-tailed deer, bison, elk, black bear, canid (dog or wolf), raccoon, beaver, wild turkey, turtle, and various mussels.

Independence Creek Survey

In this section the prehistory of the Independence Creek watershed is discussed with respect to selected sites of the prehistoric temporal periods represented. Discussion begins with the Archaic period because no Paleoindian sites have been recorded in the basin. Elsewhere in the loess hills and on gravel bars along the lower Missouri and Kansas River valleys in northeastern Kansas, archeologists have recovered diagnostic projectile points of Paleoindian age, including Clovis, Folsom, Plainview, and Dalton types (Hofman 1996; Logan and Johnson 1997; Logan et al. 1998; Wetherill 1995; Witty and Marshall 1968). Paleoindian chipped stone tools, such as Dalton points, are represented in the Father Felix Nolte Collection, so it is apparent that the region was occupied at that time. Thus far, however, no Paleoindian site has been documented in the project area.

Despite historic documentation of a Kansa village at the mouth of Independence Creek—and indirect archeological verification of it by mortuary data from the Doniphan site (Rogers 1988; Wedel 1959)—no evidence of Protohistoric period activity was documented as a result of the KATP project. Extensive

surface survey and shovel testing in the Doniphan townsite failed to locate any definite evidence of Kansa or other Oneota occupation; rather, more evidence of Late Prehistoric activity was found.

The 116 sites in the Independence Creek area have 144 components of various time periods. Thirteen (9 percent) of these sites are Historic and are not discussed (but see Keck 2001). They represent a very small portion of the Euroamerican sites that date from the late seventeenth to twentieth centuries and cannot be considered representative of the period's variety. The focus here is on the 131 components of prehistoric periods represented at 109 sites. Suggested temporal affiliations are based on my review and interpretation of diagnostic artifacts in the KSHS collections. In only a few instances do these differ from those given on site forms. For previously recorded sites not investigated during the KATP field school, I have retained suggested affiliations from the DASC database.

Artifacts that I consider to be diagnostic of temporal or cultural affiliation and/or site function are illustrated. For the quantity and classification of non-diagnostic artifacts, primarily debitage, I relied on the KSHS artifact catalogue. I reviewed all artifacts from each KATP site in the KSHS Archeology Laboratory at the Kansas History Center in Topeka. In some cases I relied on additional information about sites provided in summary reports by survey team leaders or in progress reports that accompany the site forms.

With regard to topographic contexts, I followed site form data. In a few cases pertaining to the uplands, I modified that information to reflect my preferred definition of the site setting. For my purposes *bluffs* are uplands immediately adjacent to and overlooking a major stream valley (Deer Creek, Independence Creek, and the Missouri River), *hills* are rounded landforms in uplands higher up the watershed and beyond view of a major valley, and *ridges* are elongate summits in either place. Each of these types of higher ground contains adjacent *slopes*, and, where the latter meets the lowlands, a *toe*. Bottomland settings are nearly always the T1 terrace, though one site was exposed in a stream bank and a few sites were found on what is described as the T2 terrace. In my review of the site topographic maps that accompany each KATP site form, I sometimes found that the landform described as the T2 terrace better fit the description of an upland ridge. Readers interested in greater detail of a particular site's topographic setting and relative elevation with respect to a valley should consult the DEMs and topographic maps on the CD-ROM that accompanies the final report.

Archaic

Nineteen components of the Archaic period (ca. 9000-500 B.C.) are defined by various styles of stemmed projectile point/knives (PPKs) that elsewhere in the Great Plains and Midwest have been found in radiocarbon-dated contexts. In those regions PPKs typical of the Archaic are straight- or square-stemmed (e.g., Etley), barbed (e.g., Afton, Calf Creek, Hardin), side-notched or flared (e.g., Logan Creek, Matanzas, Table Rock), side-notched with concave bases (e.g., Graham Cave), or lanceolate (e.g., Nebo Hill, Sedalia) (compare Bell 1960; Cook 1976; Fowler 1959; Hofman 1996; Justice 1987; Logan 1952; McMillan 1976; Perino 1968). Other diagnostics useful for identifying Archaic sites include the three-quarter grooved axe, which is considered a diagnostic of the Nebo Hill phase of the Late Archaic (Reid 1983, 1984).

Six sites are assigned tentatively to a more general Archaic/Woodland category, pending recovery of more diagnostic evidence. Lacking sherds of specific ceramic wares, these sites cannot be assigned confidently to Woodland time. Expanding-stemmed bifaces found at project-area sites are not sufficient for assigning components to the Woodland period. Such artifacts, frequently considered hallmarks of the Woodland period, have been found in Late Archaic contexts (e.g., Cook 1976; McElrath et al. 1984; Reid 1983). Several tools of this general type were recovered at the DB site (14LV1079), a multi-component, ridge-top camp on the Fort Leavenworth reservation (Logan 1998). Given the few Woodland sherds found there and Accelerator Mass Spectrometry (AMS) radiocarbon dating of a hearth feature and nearby trash area to ca. 800-600 B.C., it was suggested that these PPKs were associated with a terminal Archaic occupation (Logan 1998:304-306; compare Logan 2001a). Similarly, contracting-stemmed PPKs appeared during the Late Archaic period (Gary type) but continued through the Early Woodland (Adena type) and Middle Woodland (Dickson type) periods. Basal fragments of such bifaces, in particular, are often difficult to assign to one of these types that, with a variety of morphological correlates, are assigned by Justice (1987:189-198) to the Dickson cluster. Given the ambiguous nature of these artifacts, sites in the Independence Creek drainage that yielded them and no associated ceramics are assigned to the category Archaic/Woodland.

Straight- or square-stemmed bifaces were recovered at the following sites: 14AT464, 14AT471, 14AT480, and 14DP413 (Figure 1). A three-quarter grooved axe found at 14DP413 by an informant and

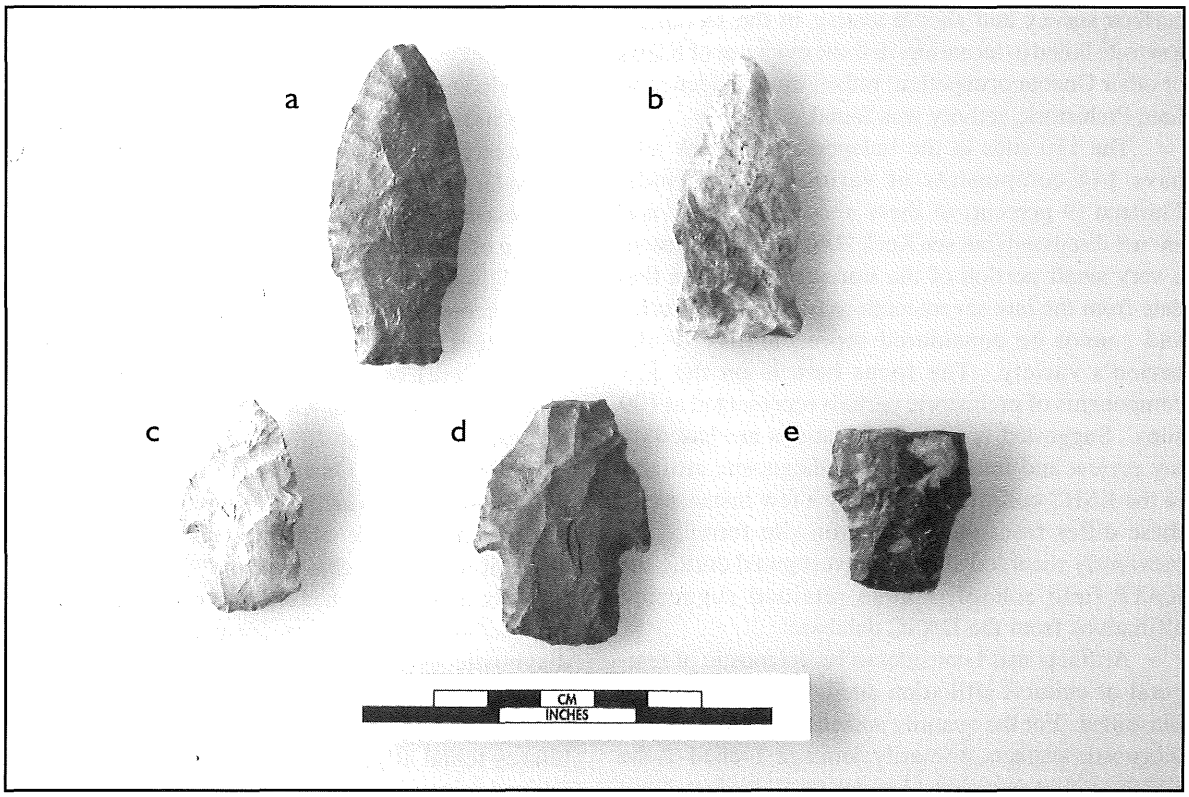

Figure 1. Archaic projectile point/knives from 14AT480 (a), 14AT463 (b), 14DP413 (c), 14AT463 (d), and 14AT471 (e).

donated to the KSHS also supports its Archaic affiliation (Figure 2). Archaic components are represented by broadly side-notched or flaring-based PPKs (compare Matanzas type; Cook 1976) at 14DP421, 14AT434, 14AT444, and 14AT486 (Figure 3). An Archaic component is represented at 14AT445 by a shallowly side-notched, flat-based biface (compare Logan Creek type; Anderson 1980; Kivett 1959) (Figure 4b). All of these sites are tentatively dated from Middle to Late Archaic time (ca. 9000 to 5000 before present [B.P.]). No clear evidence of the Nebo Hill phase of the Late Archaic period (5000-2500 B.P.) was found, though a few lanceolates are suggestive of its presence in the study area. Such artifacts were recovered at 14AT434 and 14AT438 (Figure 4a & c).

Examples of corner-notched PPKs that represent Archaic/Woodland components include a barbed, reworked biface from 14AT488 (Figure 5a). However, support for Archaic placement of 14AT488 is a broken but reparable three-quarter grooved axe (Figure 6). Another is a broad-bladed, serrate-edged biface found at 14AT457 (Figure 5b). It is similar to the Kirk Corner Notched type, an Early Archaic diagnostic dated ca. 7500-6900 B.C. (Justice 1987:71-77). While common throughout the eastern United States, this type is rare west of the Mississippi. Given its singularity and surface context, we cannot be certain that it represents an Archaic occupation. More intensive surveys are needed at this site and others placed in the Archaic/Woodland category in order to refine their temporal affiliation.

Topographic Context

Archaic components are found in a wide range of settings. Eleven components are on terraces, and the other eight are in nearly every variety of upland setting (bluff top = 1; bluff slope = 2; ridge top = 1; ridge top and slope = 1; hilltop = 1; hill slope = 1; toe slope = 1). Of the six components assigned to the Archaic/Woodland category, two were on terraces, and those remaining are in several upland settings (bluff slope = 1; ridge top = 2; hilltop and slope = 1). We might anticipate more upland components because evidence of earlier Holocene activity in the lowlands would be buried too deeply for discovery during surface survey.

Figure 2. Three-quarter grooved axe from 14AT413.

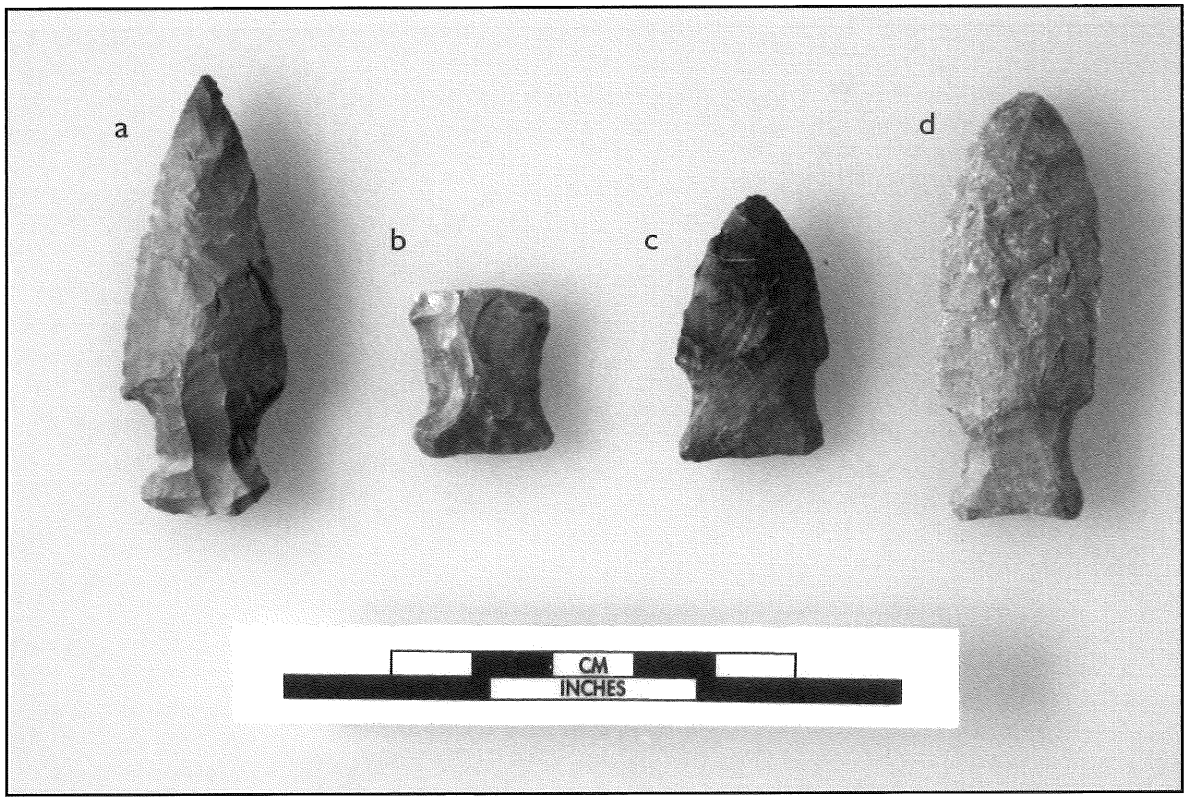

Figure 3. Archaic projectile point/knives from 14AT486 (a), 14AT444 (b), 14AT434 (c), and 14DP421 (d).

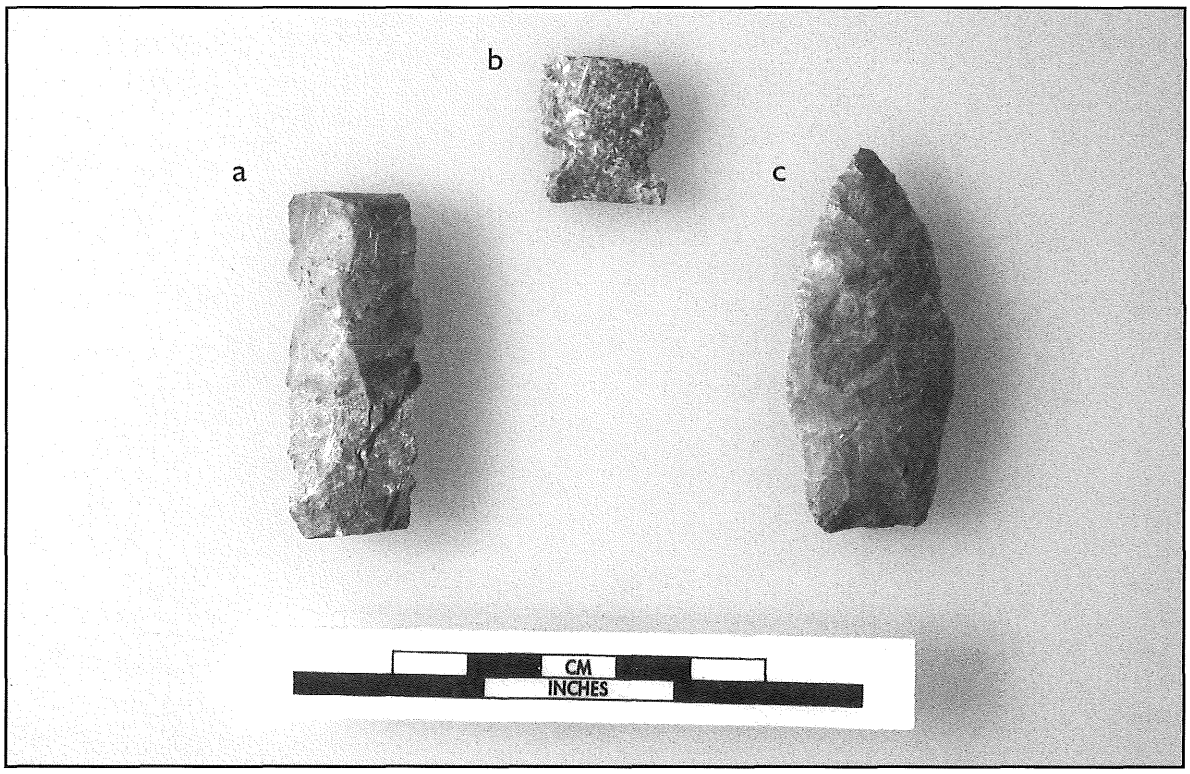

Figure 4. Archaic projectile point/knives from 14AT434 (a), 14AT445 (b), and 14AT438 (c).

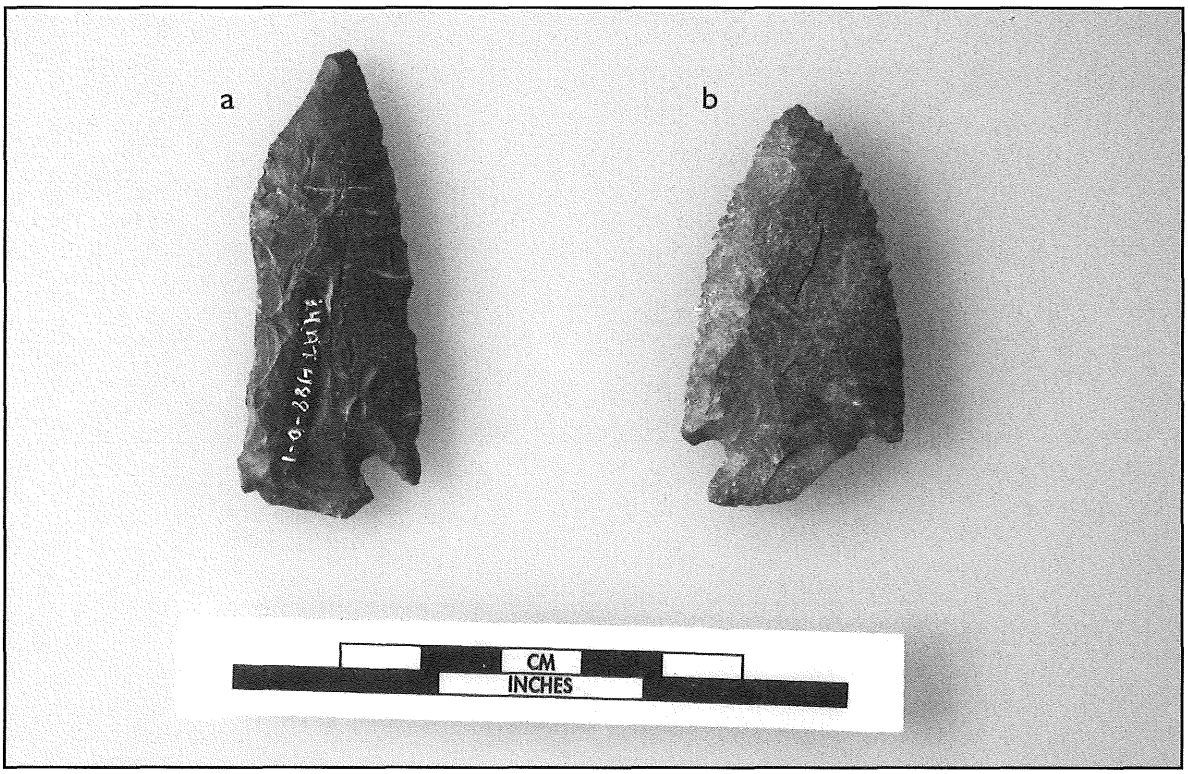

Figure 5. Archaic/Woodland projectile point/knives from 14AT488 (a) and 14AT457 (b).

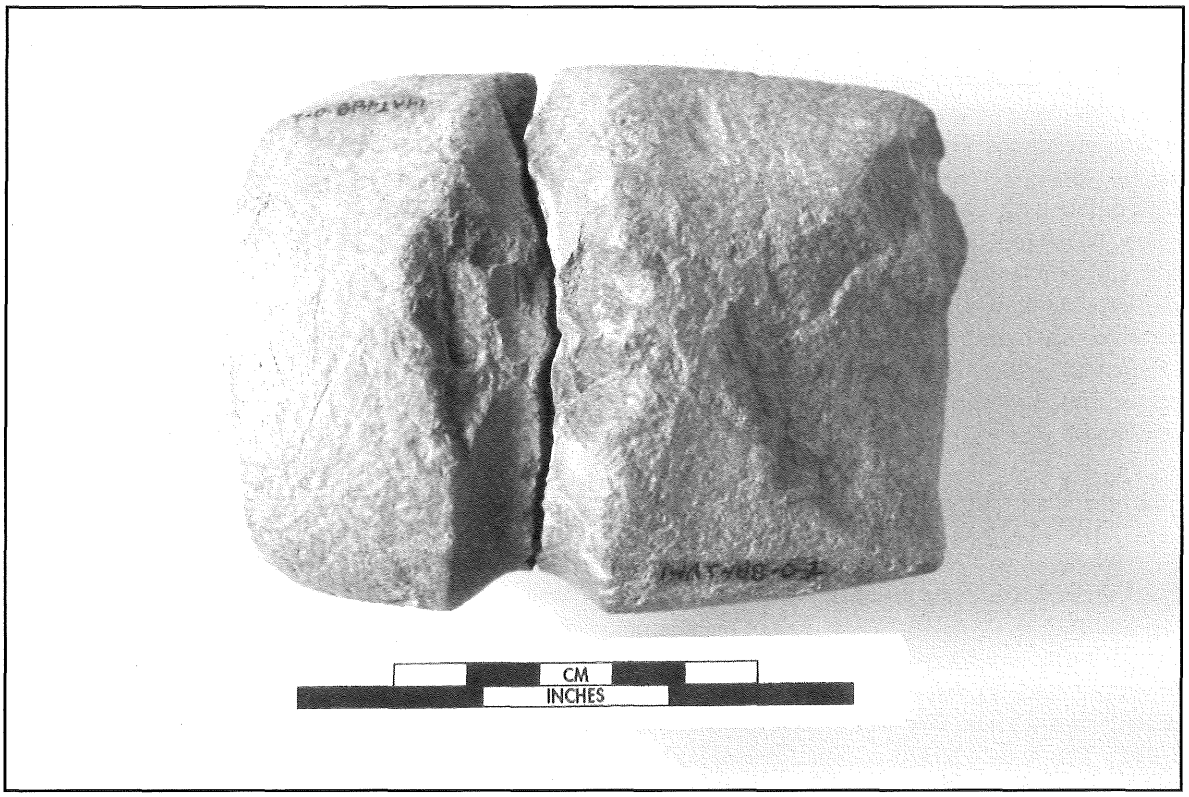

Figure 6. Three-quarter grooved axe from 14AT488.

However, that is not the case at all; indeed, slightly more than half of the components are in the valleys of Independence Creek (n = 5) and Deer Creek (n = 5) with another nearer the Missouri River valley.

It would be worthwhile to know the precise provenience of lowland finds of Archaic diagnostics. Such information for a few sites suggests chance exposure of artifacts buried below the terrace. For example, a reworked lanceolate was found on the terrace scarp (slope) at 14AT438 where the tread (horizontal surface) had revealed more abundant evidence of a Late Prehistoric occupation (see below). The artifact's location on the scarp may indicate that it eroded from fill below the terrace. Similarly, the Archaic PPK from 14DP421 is described as having been found "not on the crest of the terrace ... but down along the bottom of a[n] erosional channel that lay to the immediate east of [a] high knoll" (R. M. Thies, progress report in KSHS site file). The same report notes that the site informant donated a point to the KSHS that had been found earlier in the gully. It is described as a "thick, medium-sized, slightly stemmed point, which would appear to be of the same age as the Archaic-looking point ... found on 8 June" (R. M. Thies, progress report in KSHS site file). The site file also has photocopies of three square-stemmed PPKs found at the site by the informant, but their intra-site provenience is unknown. The provenience of Archaic artifacts at 14DP441, including a three-quarter grooved axe found by the informant, is unclear. However, the site form notes that "cultural debris [was] scattered over [the] crest and slopes of [the] terrace edge" (KSHS site file). More specific information about the location of these Archaic finds might have permitted inference of a buried component.

In at least one case, a component suggested to be of Late Archaic age is exposed on a terrace, indicating relatively shallow burial. This is 14AT480, where two stemmed PPKs were found "on a terrace edge within a meander east of Deer Creek.." More specifically, the material is noted as having been "found on the upper terrace surface" (KSHS site file). Such shallow burial of Late Archaic components on T1 terraces has been noted elsewhere in northeastern Kansas. For example, Nebo Hill lanceolates have been recovered from 14LV24 on the T1 terrace along Nine Mile Creek, a tributary of Stranger Creek (Logan 1981) and in a comparable setting at 14AT421 in Little Walnut Creek valley (Logan 1986). At 14AT421 the lower half of a Nebo Hill lanceolate was found at a depth of 40-50

cm in a test excavation, and subsequent deep plowing of the field around it exposed two more complete ones.

In sum, we should not assume that Archaic sites cannot be found in lowlands in northeastern Kansas or that, given their low frequency in valleys, upland locales were preferred for settlement by hunter-gatherers of that time. Rather, we can assume that the fill below T1 terraces contains Archaic deposits and that they may be exposed by erosion on scarps and gullies and by deep plowing and subsequent deflation. To the extent that site recorders describe precisely the location of Archaic finds, they provide future investigators with the information needed to infer component burial.

Woodland

Twenty-eight components in the Independence Creek watershed are assigned to the Woodland period (ca. 500 B.C.-A.D. 1000). These do not include the six previously mentioned components of the Archaic/Woodland category, nor do they include five components assigned to the Woodland/Late Prehistoric category. The latter yielded ceramic assemblages of sherds either too small or ambiguous in terms of such attributes as surface treatment and temper that might otherwise have been used to identify them as Woodland or Late Prehistoric. Some ceramic attributes of cultures defined for these periods are common. For example, Nebraska phase pottery may be cordmarked and sand or grit tempered, attributes of some regional Late (Plains) Woodland cultures. Late Prehistoric pottery also may be plain surfaced and sand tempered, just as ceramics of the Middle Woodland (Kansas City Hopewell) period. Without such decorative treatment as rocker marking, it is sometimes difficult to distinguish body sherds of Kansas City Hopewell pottery from plain-surfaced and sand-tempered sherds of the Nebraska phase, particularly if the pieces are small.

Diagnostic artifacts from the 28 Woodland components in the watershed include corner-notched (Steuben type) or contracting-stemmed (Gary and Dickson types) bifaces and corner-notched arrow points (Scallorn type). As noted in the discussion of Archaic sites, these identifications must be considered tentative, given recovery of comparable chipped stone tools (excluding Scallorn points) from Late Archaic and Early Woodland contexts throughout the greater Midwest. Ceramics are more reliable diagnostics for Woodland assignment, particularly to the extent that fragments reflect the larger, elongate, conical-based jars characteristic of that period. Useful sherds have sufficient surface area ($\geq$ 6 cm^2 or $\geq$2.5 cm along one dimension) to exhibit surface treatment (plain or cordmarked), temper (sand or dense grit), and relatively high, straight or everted rims.

A striking aspect of Woodland sites in the Independence Creek watershed, insofar as they are now known, is the lack of clear evidence of Middle Woodland sites. To a certain extent, this is attributable to the small number and size of sherds from most of the Woodland components and to the absence of such clear evidence as decorated rims or rocker-marked body sherds. In the northern part of Doniphan County, Middle Woodland sites of both the Kansas City Hopewell and the Valley variants are recorded and some, such as the Kelly (Katz 1969) and Taylor Mound (O'Brien 1971) sites, have been extensively excavated (Johnson 1976a). During my review of assemblages from the KATP sites, I also examined ceramic assemblages from sites in that area, finding Middle Woodland sherds in14DP321 (body sherds with punctates and punctates over cord or fabric impressions; and straight, slightly everted, plain and punctated rims), 14DP322 (straight, high, plain and punctated rim), 14DP338 (rocker marked and punctated sherds), and 14DP346 (straight, high rim with parallel cord impressions and an obliquely tool-impressed lip). Kansas City Hopewell sites are known elsewhere in northeastern Kansas (Logan 2003b), including the valleys of Little Walnut Creek (Logan 1986), Salt Creek (Witty and Marshall 1968), Quarry Creek (Logan 1993), and Stranger Creek (Logan 1981, 1985). It is unlikely that Kansas City Hopewell populations forsook Independence Creek; rather, more intensive surveys at Woodland sites there are needed to find evidence of them.

Late (Plains) Woodland sites in northeastern Kansas are recognized by Grasshopper Falls phase ware (Reynolds 1979), whose attributes include thick vessel walls, exterior cordmarks, occasional horizontally brushed interior surfaces (particularly inside the rim), dense grit temper, and straight to everted rims that are rarely decorated. Such pottery was generally well represented at Woodland sites in Stranger Creek basin (Logan 1981, 1983, 1985). Yet the KATP survey in Independence Creek found only a few such sherds at a small number of sites, three of which are described in the "Tested Sites" section (see page 20).

14DP429 is tentatively identified as having a Woodland component on the basis of three bifaces—two of the corner-notched variety and one of the expanding-stemmed variety (Figure 7)—and a few small, thick, sand-tempered sherds with plain or cordmarked surfaces. Most of the 135 sherds in the ceramic assemblage, including all 11 rims, are associated with a Late Prehistoric component.

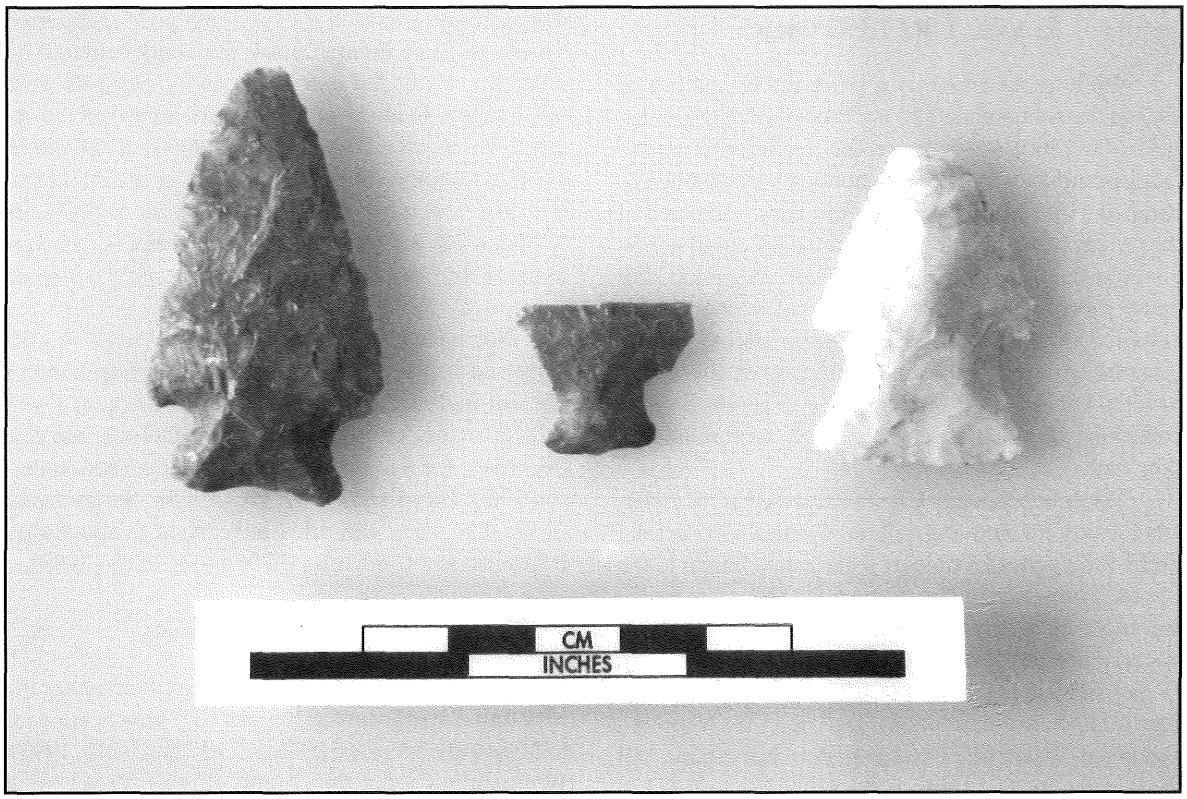

Figure 7. Woodland projectile point/knives from 14DP429.

The Woodland component at 14DP343 is tenuously identified from a small corner-notched arrow point and a single small, eroded body sherd with dense sand and grit temper. Clearly, greater numbers and larger pieces of pottery are needed to verify this temporal affiliation. The same must be said for 14AT465 from which a single thick body sherd with plain surface and dense sand temper was recovered. Similarly, 22 body sherds and a single small rim sherd found at 14AT460 may be Woodland ware, but the sample size is too small and the attributes too generalized (i.e., comparable in some respects to Nebraska phase pottery) to rule out a Late Prehistoric component.

Topographic Context

Sites with Woodland components are twice as numerous in valley settings as on uplands. Eighteen components have been recorded in valleys with all but one on terraces. (The exception is on a stream bank.) Nine components are in a variety of upland settings (i.e., bluff top = 2; bluff slope = 1; ridge top = 1; ridge top and slope = 1; hilltop = 1; hill slope = 2; toe slope = 1). One site (14AT310), recorded prior to the KATP survey in the Atchison County Lake area, has no recorded topographic data. Components of this period are more plentiful by far in Independence Creek (n = 22), with only five known in Deer Creek and another at the confluence of the streams. While a settlement preference for lowland areas may be suggested, it is as likely that no more recent ceramic-age sites have been buried beyond the reach of surface survey like most Archaic sites. Of components assigned to the Woodland/Late Prehistoric category, four are on terraces in the Independence Creek valley, and one is on a hilltop overlooking the Missouri River.

There is a distinct cluster of 11 Woodland sites in the Independence Creek valley on the broad terrace at its confluence with Rock Creek. No comparable density of components of any other temporal period is yet known in the study area. Researchers interested in the Woodland period will want to explore this concentration more extensively in order to determine if it reflects a survey bias or was a favored area for settlement during Woodland time. More thorough survey of the lowlands may show that Independence Creek, like the Stranger Creek basin, is characterized by the "valley packing" characteristic of the ceramic periods (Adair 1988; Logan 1985:250-251), a development discussed in more detail in the "Conclusions" section (see page 22).

Late Prehistoric

While represented by a comparable number of sites in the watershed, the Late Prehistoric period (ca. A.D. 900-1500) was more readily recognized in artifact assemblages from 27 components by distinctive chipped stone and ceramic assemblages. As noted in the previous section, some ceramic sites could not be distinguished as Late Prehistoric or Woodland, but many more were confidently placed in the former because they contained triangular arrow points (unnotched or notched), small end scrapers, alternately beveled knives, stone or clay pipes, or ceramic wares consisting of globular jars and bowls with relatively thin walls.

The Independence Creek watershed is an excellent locality for studying cultural dynamics in the Late Prehistoric period, a time of significant change in the Central Plains marked by increasing reliance on maize and other cultigens and increased regionalization of material inventories (Adair 1988; Logan 1985, 1988a; Logan and Ritterbush 1994). The core areas of three Late Prehistoric cultures converged here: the Nebraska and Steed-Kisker phases and the Pomona variant. All share some artifact traits, particularly with regard to the aforementioned chipped stone artifacts and ground stone tools (e.g., sandstone shaft abraders, mullers, manos, and metates). Sites often include house remains, marked by daub (grass-impressed, burned earth), post molds, cache pits, and hearths. Below are summaries of these cultures' distinguishing characteristics, which are primarily ceramic types but also may include house forms.

Nebraska Phase

This phase is generally recognized at sites along tributary streams of the Missouri River on the Nebraska-Iowa border and as far south as the project area. Indeed, Doniphan County is generally described as the southernmost extent of its geographical core (e.g., Billeck 1993; Blakeslee and Caldwell 1979; Gradwohl 1969; Logan 1996). However, a few sites of the Nebraska phase are known as far south as Johnson County, Kansas (Logan 1990b), and ceramic artifacts diagnostic of the culture have been found at several sites in Leavenworth County, including the DB and Scott sites (Logan 1998, 2001b 2002). In that area Nebraska pottery is often associated with Steed-Kisker or Pomona wares.

Nebraska phase houses, like those of the Steed-Kisker phase, were square to sub-rectangular with rounded corners. They were supported by a framework of closely spaced wall and roof posts, supported by four or more internal posts, generally centered on a hearth. Extended entryways and cache pits were other salient features of these wattle-and-daub structures, which were large enough to house a nuclear or extended family. They occur singly or in small clusters and are most aptly described as farmsteads (O'Brien 1978a). Sites with large numbers of house remains were not likely villages but serially occupied homes.

Nebraska phase pottery consists of sand- or grit-tempered bowls and jars with lug and strap handles and rim-incised designs. Rims may be thickened with a fillet or collar. Defined wares include McVey, Beckman, and Swaboda pottery (Anderson and Anderson 1960; Gunnerson 1952; Ives 1955). Seriations of Nebraska phase ceramics have been proposed by Blakeslee and Caldwell (1979) and Billeck (1993).

Steed-Kisker Phase

The Steed-Kisker phase was centered along the Missouri River from the Kansas City area northward to St. Joseph, Missouri (O'Brien 1978a, 1978b, 1993). While more sites of this complex have been recorded east of the Missouri River trench, recent surveys and excavations on the Kansas side have documented several sites of the phase and suggest that the core area extended there (Logan 1985, 1988 1996, 1998, 2002, 2003a).

The most distinctive traits of the Steed-Kisker phase are ceramic and are similar to Middle Mississippian cultures of eastern Missouri and western Illinois. Pottery includes bowls and jars with plain surfaces that may be decorated with a variety of straight or curvilinear incised lines. Rims have rounded lips, are often low and outwardly rolled, and bear appendages such as strap or loop handles, tabs, and zoomorphic or anthropomorphic effigies. Temper is crushed mussel shell, which often has leached and left empty slots parallel to sherd surfaces. Defined wares of the complex are Platte Valley Plain and Steed-Kisker Incised (Calabrese 1969; Chapman 1980).

Pomona Variant

Sites of the Pomona variant are found throughout most of eastern Kansas, and its core area extended to the Delaware River valley west and south of Independence Creek (Brown 1984; Witty 1967, 1978). Pomona pottery consists of small to medium-sized globular, plain or cordmarked vessels. In contrast to Nebraska and Steed-Kisker vessels, Pomona pots have

Figure 8. Arrow points from 14DP413.

high rims that are straight, unthickened, and generally undecorated. Temper varies more than that of other Late Prehistoric wares of the region but is most frequently grog (crushed sherds). The most notable nonceramic Pomona trait is house "form." Often notoriously unclear even where discernible house outlines have been preserved, they are oval and point to direct descent from indigenous Late Woodland populations (e.g., the Greenwood and Grasshopper Falls phases; Adair 1996; Brown 1984; Logan 1996; Witty 1978).

I have selected seven sites that exemplify the variety of Late Prehistoric components recorded during the KATP project. Another component (14AT438) is described in the "Tested Sites" section (see page 20).

14DP413, situated on a terrace in the Independence Creek valley, includes an Archaic component, but a Late Prehistoric occupation is more evident. The KATP survey team recovered daub, indicative of a house structure, as well as burned earth, bone, and charcoal. The chipped stone assemblage includes two arrow points, one unnotched and the other side-notched (Figure 8). Pottery consists of 32 body sherds, all stone (sand or grit) tempered. Of these, 24 are too small for analysis, but 6 have sufficient surface area and show plain treatment. One is a rim with an extensively eroded lip, but it shows evidence of pinching. Another is from a vessel with a flared shoulder. This small assemblage is suggestive of a Nebraska phase affiliation.

14DP424 is on a hilltop beyond the Independence Creek valley and is east of the small, unnamed drainage that flows by the Doniphan site. Here the survey team recovered a small amount of daub and burned bone, an unfinished projectile point, 2 scrapers, debitage, and 28 pottery sherds. The latter includes a shell-tempered rim with strap handle (Figure 9a). Of the 27 body sherds, 5 are too small for analysis, but 3 exhibit cordmarked exterior surfaces and sand temper, 13 are plain and sand tempered, and 6 are plain with evidence of shell temper. This site is typical of Late Prehistoric sites in the Kansas City locality that yield ceramic evidence characteristic of both the Nebraska and Steed-Kisker phases.

14DP429 is on a terrace along the North Branch of Independence Creek. As previously noted, it includes slight evidence of a Woodland occupation. More extensive remains of a Late Prehistoric component were found, including unnotched and side-notched arrow points (Figure 10) and house remains in the form of daub. The daub was found in an area unaffected by terrace construction that elsewhere had impacted the site and led the survey team leader to suggest that the site "has good potential for finding ... the remains of a daub house or earthlodge" (Thies 2001, progress report in KSHS site file). The ceramic

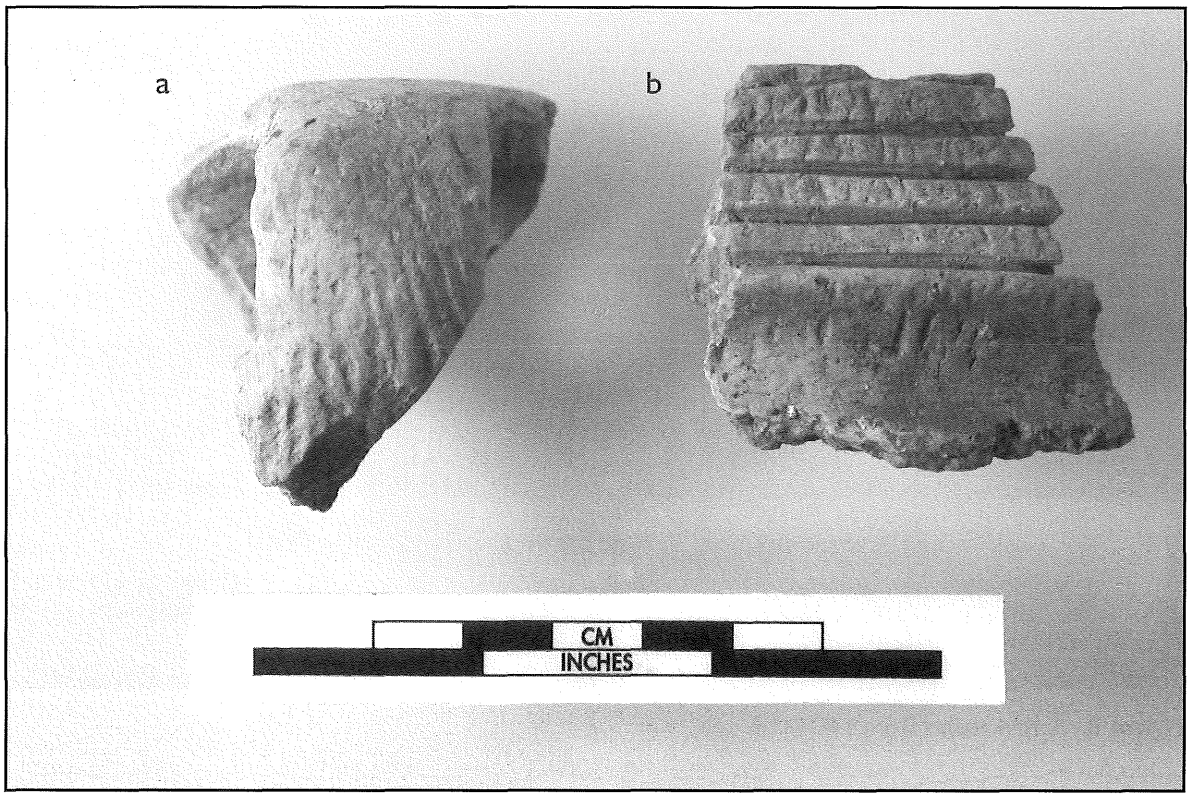

Figure 9. Rim sherds from 14DP424 (a) and 14DP429 (b).

Figure 10. Arrow points from 14DP429.

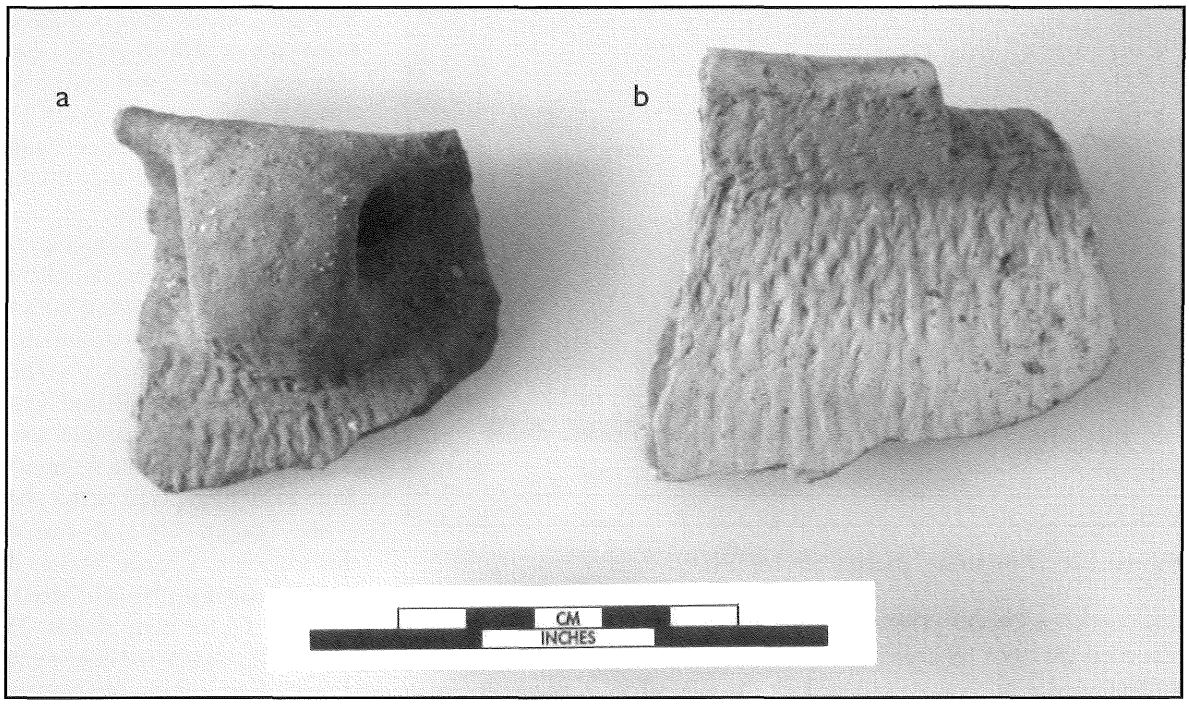

Figure 11. Rim sherds from 14DP439 (a) and 14DP446 (b).

assemblage is relatively large, consisting of 134 sherds, though many of these (n = 62) are too small or eroded for analysis. Of the larger sherds, 6 are plain, shell tempered, and range from thin to moderately thick; 23 are plain, sand tempered, and of comparable thickness to the aforementioned; and 32 are cordmarked and sand tempered. Others are a shell-tempered shoulder/neck sherd with an extensively eroded exterior surface, a large body sherd (three cross-mended pieces) that exhibits cordmarking and traces of shell temper, and a sand-tempered body sherd with a remnant appendage, possibly a handle.

The ceramics include nine rim sherds that exhibit the same variety of exterior surface treatment and tempering agents as the body sherds. All but two have sand temper; the exceptions are one with the remnant slots of shell temper and another with no evident aplastic. The shell-tempered rim has a flat lip but is too small for comparison to Steed-Kisker phase pottery. The other rims display attributes of Nebraska phase pottery. Lips are rounded or flat, and exterior surfaces are plain. Rim height can only be measured on three specimens. Of these, one is 1-2 cm high and has a flared shoulder, another is 3 cm high and straight with a flared shoulder, and the third has a 2.5-3-cm-high collar that has been decorated with five incised horizontal lines (Figure 9b). Again, the variety of surface treatments and tempering agents in the ceramic assemblage from this site may point to interaction between Nebraska and Steed-Kisker groups in the area or to ceramic variability within a single population.

14DP439 is a single component site on a terrace along Independence Creek. Here the survey team recovered a small amount of daub and debitage, as well as a biface, uniface, and small sample of ceramics. The sample includes a rim with strap handle (Figure 11a) from a vessel that was cordmarked and sand tempered and had an estimated mouth diameter of 16 cm. Of the 10 body sherds collected, 2 are quite small, and exterior surface treatment could not be determined. Of the remainder, seven are plain and one is cordmarked. All are tempered with sand. Though the sample is small, it supports a Nebraska phase affiliation.

14DP446 is also a single component site on a terrace in Independence Creek valley. Although the site was recorded as a result of the KATP survey, it was not inspected at that time. Rather, its suggested cultural affiliation is based on a rim sherd collected there and donated to the KSHS by one of the informants (Figure 11b). It is a high, straight rim from a cordmarked, sand-tempered vessel. These attributes are found in both Nebraska and some Pomona wares, though sand temper is notably more common in the former.

14AT327 is on a bluff top overlooking

Figure 12. "Pipestone" piece from 14AT434.

Independence Creek. The site was discovered and recorded in 1992 by Bob Thompson, who found artifacts and a pit feature exposed on the side of a trench silo. A KATP crew extensively surveyed and shovel-tested the site. Their work yielded an end scraper fragment, a small number of flakes, and a few pieces of daub and burned earth. At the time of his initial discovery of the site, Thompson recovered two Scallorn-like arrow points and a few sherds from the side of the silo trench. The pit feature was excavated under the direction of Randall Thies (progress report in KSHS site file). Its Late Prehistoric placement was verified by a radiocarbon assay on charcoal from the pit that provided a corrected date of 960±60 B.P. (Tx-7774). Flotation samples contained burned maize. Scallorn-like projectile points like those found near the feature are not unusual at Late Prehistoric sites and may point to the derivation of some cultures from Late Woodland populations. However, this is more apparent for the Pomona variant, and indeed sherds from the site have been compared favorably to that complex (R. M. Thies, progress report in KSHS site file). Pottery donated to the KSHS by Thompson and augmented by several more recovered from the pit feature is described as "relatively thin, deeply cord-marked, [with] tan surfaces" and temper that appears to be "a combination of crushed sherds and crushed sand" (R. M. Thies, progress report in KSHS site file).

14AT434 is a multicomponent site on a terrace along Deer Creek that was recorded in 1989. Evidence of an Archaic occupation is described in the "Archaic" section (see page 7). More extensive remains of Late Prehistoric activity were recovered during the KATP survey. These include notched and unnotched triangular arrow points, biface fragments, a drill fragment, end scrapers, debitage, and a piece of incised "pipestone" (Figures 12 and 13). At least three daub scatters were found that might reflect as many houses.

The ceramic assemblage is compatible with Nebraska phase wares. A single rim sherd with a rounded lip and the remnant of a flaring shoulder is plain and tempered with sand and grit (Figure 14c). The sample also contains a small handle fragment from a shell-tempered vessel and a tab. Feagins (2001) discussed this fragment (Figure 14a) as it reflects shared attributes of Steed-Kisker and Nebraska wares. Of the body sherds, 21 (46.3 g) are plain, are either shell tempered or have no apparent temper, and range from thin to moderately thick. These would be consistent with a Steed-Kisker affiliation. However, the assemblage also includes four sherds (23.5 g) that are cordmarked, sand tempered, and of moderate thickness, which support a Nebraska phase affiliation. Forty-six others (168.1 g) contain fine sand temper but have plain surfaces, one of which is a straight, relatively high rim fragment (the lip is eroded) without decoration. While most of these are moderately thick, two (27.2 g) are noticeably thick and could be indicative of a Middle Woodland component. Certainly a greater sample of pottery, particularly rims, is needed to confirm a Woodland presence.

A portion of a ceramic pipe also was found (Figure 14b); however, both bowl and stem are damaged, and there is no apparent temper. Elbow pipes of ceramic medium are often found at Nebraska phase sites, and this example appears to support an affiliation of 14AT434 with that culture.

Topographic Context

Similar to the Woodland components in the Independence Creek watershed, Late Prehistoric sites are noticeably more numerous in lowlands than uplands. Seventeen (63 percent) of the 27 components are on terraces, and another extends from the terrace onto an adjacent toe slope. Nine components are in upland settings: four on bluff tops, one on a bluff slope, one on a ridge top, one on a ridge toe, one on a hilltop, and one on a hilltop and slope. Most (n =

Figure 13. Arrow points and scraper from 14AT434.

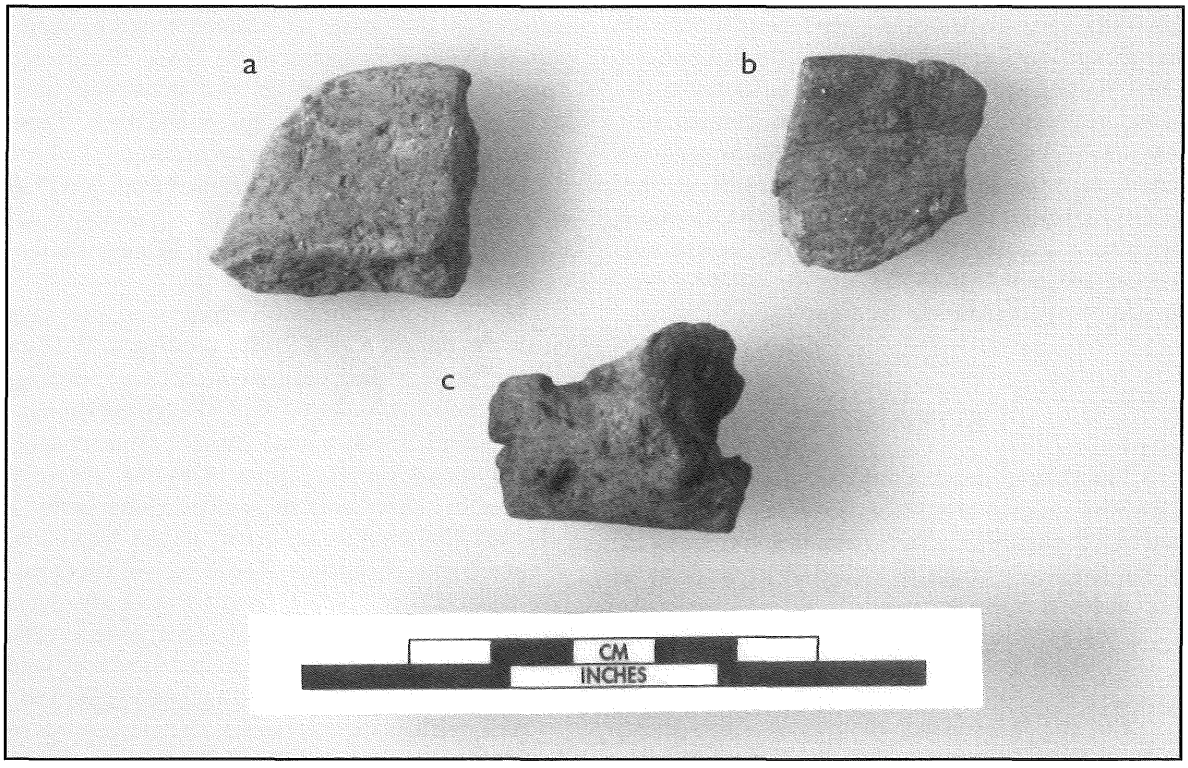

Figure 14. Ceramic tab (a), rim sherd (b) and pipe (c), from 14AT434.

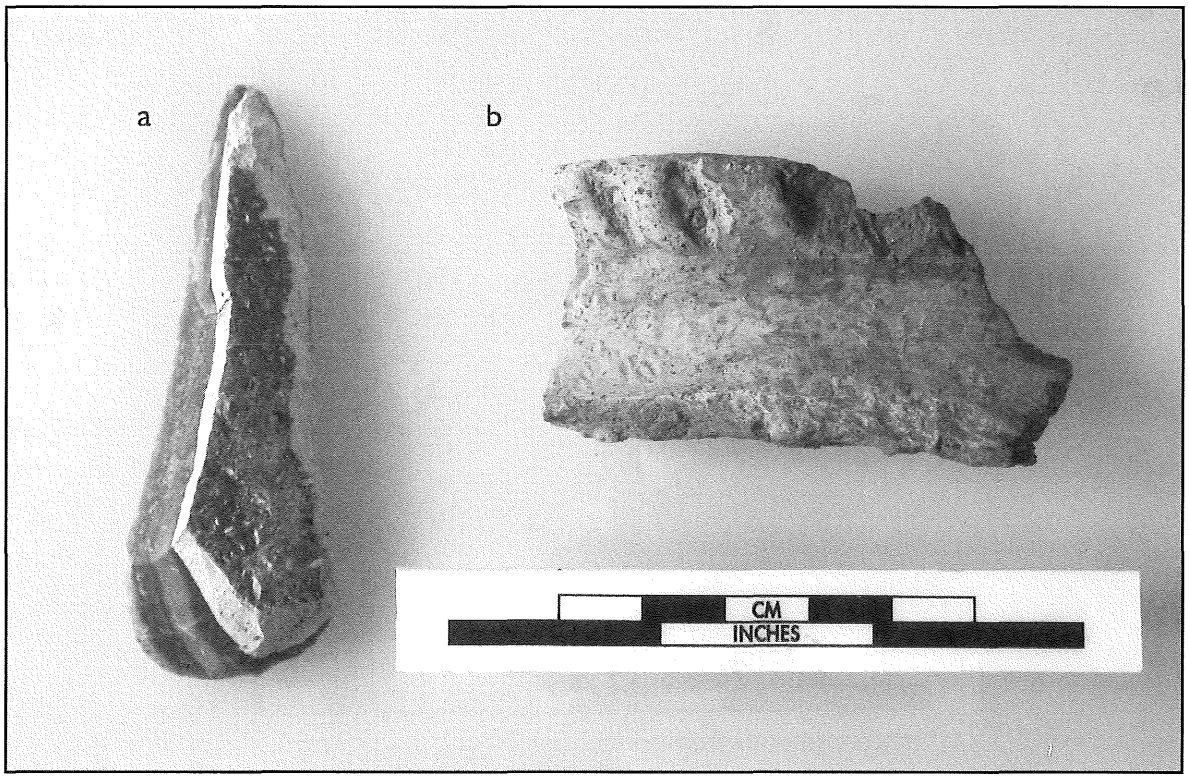

Figure 15. End scraper (a) and rim sherd (b) from 14AT438.

17) of the sites are nearer Independence Creek, with five along Deer Creek, one at the confluence of Deer Creek and its parent stream, and three closer to the Missouri River. No high-density concentration, like that noted above for the Woodland sites, is apparent among the recorded sites. The number of Late Prehistoric components near the Doniphan site was more than doubled (to six) by the KATP survey, supporting the interpretation that 14DP2 was the center of prolonged occupation during that time.

Tested Sites

Four sites were extensively surveyed and test excavated in order to explore their research potential and NRHP eligibility. Their components represent all of the temporal periods described by representative sites in the previous sections.

14AT438

This site covers about 10 acres on a terrace and its scarp in the Deer Creek valley just a short distance above its confluence with Independence Creek. It was recorded in 1989 based on artifacts found by members of the Kanza Chapter of the KAA. Recovered material included pottery, chipped stone tools (projectile points, knives, and scrapers), and daub. These artifacts suggested a Woodland occupation. In 1991 KSHS archeologists reviewed artifacts from 14AT438 collected by Bob Thompson, including pottery diagnostic of the Late Prehistoric period. Testing was recommended following that review.

KATP investigations occurred over four days under the direction of KSHS archeologist William Banks. They entailed surface collection and excavation of seven 1-m^2 units, three of which were contiguous to form a 1 x 3-m unit. Surface remains again pointed to multiple occupations of the site. As noted in the above discussion of Archaic components, a stemmed PPK from the scarp may reflect deep burial of a preceramic occupation. The small number of surface-collected items includes a half dozen body sherds and one rim sherd of Late Prehistoric pottery. The latter is a thickened and tool-decorated sherd with sand temper indicative of the Nebraska phase (Figure 15b).

Tests yielded more ceramics, including sherds of Platte Valley ware, the plain, shell-tempered pottery associated with the Steed-Kisker phase. One unit also

contained an end scraper of Permian chert from the Flint Hills (Figure 15a), pointing to trade with western groups or forays to that area. Test units also revealed increasing amounts of daub below the plow zone to a depth of 40-50 cm, suggesting more remains of a house structure may be present.

The potential for discovery of a relatively intact house floor and the association of ceramic wares that reflect two archeological cultures suggest this site is eligible for NRHP listing (Logan and Banks 2001). It deserves to join others in Leavenworth County, including Zacharias (14LV380; Logan 1988a, 1990b), DB (Logan 1998; Logan and Hill 2000), and Scott (14LV1082; Logan 2001b, 2002), where house remains and comparable ceramic associations have been documented. More extensive investigation of the site promises to enhance our understanding of Late Prehistoric population interaction during a time of dynamic change among the region's early farming cultures.

14AT444 AND 14AT445

These sites were recorded in 1992, following their discovery by Bob Thompson. They are discussed together as they are on a bluff top (14AT444) and bluff slope (14AT445) opposite each other across a small drainage to Independence Creek just below its confluence with Deer Creek and overlooking the Missouri River valley. The bluffs are part of a more extensive upland just east of 14AT438. Both have evidence of occupation during Archaic, Woodland, and Late Prehistoric periods. Evidence of Woodland occupation is more extensive at both, as indicated by artifacts collected by Thompson, including chipped stone tools, pottery, and daub. At least one of the ceramic artifacts from 14AT445 is a shell-tempered piece with incised lines that form a chevron. It is unclear whether this artifact indicates occupation by a Steed-Kisker phase group or one of the Protohistoric (Oneota) period. Most of the pottery in the collection is Woodland ware.

In October 1993 Thompson excavated a 2 x 2-m test unit at 14AT444. The following year he provided the author with copies of his field map, notes, and photographs of the investigation. One half of the unit was dug in 10-cm levels to a depth of 30 cm, and the other half was shovel-skimmed another 40 cm and cored yet another 40 cm. The upper 30 cm yielded sparse amounts of debitage, small pottery sherds, one scraper, some limestone, a few pieces of daub, a mano, and hammerstone. A possible post mold or filled rodent burrow was found at a depth of 23 cm.

Virginia Wulfkuhle and Martin Stein directed KATP investigations at the sites. Work at 14AT444 occurred over three days and entailed intensive surface survey, site mapping, and excavation of eight test units, each 1 m^2. Most units yielded sparse amounts of debitage, sherds, daub, burned earth, burned bone, and stone. One unit contained an expanding-stemmed point base, and another yielded a rim sherd, both artifacts pointing to Woodland occupation. Cultural material was confined to the plow zone, though two possible post molds were found below it, suggesting (together with the daub) that structures of some kind had been present.

Pottery from the surface collection at 14AT444 consists of 11 sherds, 2 of them rims, indicative of a Late (Plains) Woodland occupation. The assemblage is comparable to ceramics from sites of the Grasshopper Falls phase that are quite common in the Delaware River and Stranger Creek basins (Logan 1981, 1985; Logan and Fosha 1991; Reynolds 1979). The sherds are relatively thick, densely grit tempered, and plain. One of the rims is sharply everted. The test units yielded only five sherds. One of them is a very small rim with rounded lip, grit temper, and plain exterior. One of the body sherds—found at a depth of 20-30 cm in XU2 and the only one from a depth greater than 20 cm—is smoothed, thin, and shell tempered, supporting the previously suggested presence of a Late Prehistoric component.

Thompson's collection from 14AT445 contains grit-tempered pottery, point fragments (one with a rounded, unnotched stem), a scraper, debitage, and hammerstones. The KATP investigation included intensive surface survey, shovel testing, site mapping, and excavation of six test units, all of which yielded small amounts of cultural debris from the plow zone. Shovel tests were about two shovel-widths long, one width wide, and 20 cm deep. Of the 16 tests dug, 10 were positive, and excavation units were laid out over selected spots (V. A. Wulfkuhle, field notes in KSHS site file). Most of the units were 1 m^2, but XU5 was only 50 x 50 cm, and XU6, of like dimension, was dug contiguous to the southwest quadrant of XU1.

More pottery was found at 14AT445 than at 14AT444, although the assemblage of 64 sherds is still rather small. One of the surface finds is a single small (3.3 g) rim sherd with a rounded lip, plain exterior surface, and no apparent temper. It may be a Late Prehistoric-period artifact. Supporting such interpretation is a strap handle with fine sand temper that appears to be Nebraska phase ware. Eighteen of the surface-collected body sherds are too small for analysis. Of the balance, 18 are plain, grit-tempered

sherds of Plains Woodland ware; 1 sherd is grog tempered and cordmarked, possibly Pomona ware; 4 are thin and plain with no apparent temper; 5 are thin, plain, and shell tempered; 1 is thin, sand tempered, and cordmarked. These latter sherds support the previously inferred Late Prehistoric occupation.

In sum, excavations at the two sites did not find sub-plow zone deposits or artifact assemblages significant enough to support NRHP eligibility. The few features recorded could be post molds, but their isolated nature and ambiguous cross sections cannot rule out the possibility that they were krotovinas (filled rodent burrows). Beyond the adverse impact of plowing on the shallow cultural deposits at both sites, extensive terracing has affected 14AT445.

14AT448

This site covers about one acre on a toe slope about 20 m from Independence Creek. Bob Thompson discovered and recorded it in 1994. His collection from the site includes a contracting-stemmed biface with alternate blade beveling. While contracting-stemmed points are typical of the Woodland period, the biface is comparable to the more generalized Gary type, which also dates to the Late Archaic period (Justice 1987:189). Other finds are another biface, debitage, and hammerstones.

In the hope that colluvial deposition had mantled some of the putative Archaic component beyond the reach of plow disturbance, this site was selected for intensive surface survey and test excavation. Will Banks directed the work. Survey revealed a relatively dense scatter of lithic artifacts in the cultivated field at the site. Artifacts recovered include a corner-notched biface base (Archaic/Woodland) and two PPK tips, one of which may have been from an alternately beveled knife.

The KATP crew dug a series of five 1-m^2 test units, including four just beyond the fence line that separated the cultivated field from the steeper, grass-covered portion of the toe slope. The fifth unit, dug in the cultivated field, verified that deposits were deflated. One unit in the grassy area contained a plain body sherd with dense, fine sand temper that may be Woodland ware. While it indicates a later occupation of the site, the depth of this find (50-60 cm) and the lack of any intact deposits below it point to mixing of the components. Sparse amounts of cultural material were found in some units in the grassy part of the site to depths of nearly 1 m. From the consistently low numbers of artifacts in each unit level, it is apparent that their presence is attributable to downward transport through natural disturbance processes. Much of the curated lithic material from this site is colluvial debris, including limestone and natural chunks of Plattsmouth chert.

Given the small amount of cultural material recovered at 14AT448 and the possibility that components of Archaic and Woodland age may have been mixed, this site is not considered NRHP eligible.

Conclusions

The 2001 KATP investigated 81 (70 percent) of the 116 sites now recorded in the Independence Creek watershed. In conjunction with seven sites in adjacent drainages not described here, the project considerably enhanced the cultural resource inventory of northeastern Kansas. Though opportunistic with regard to the selection of survey tracts—favoring those more easily accessed through landowner permission and more visible through cultivation—the survey successfully documented sites of Archaic, Woodland, Late Prehistoric, and Historic age in a variety of landform settings. More extensive investigation is needed at many of these sites to determine their research potential. Of the five sites that were extensively surveyed and tested, one (14AT438) is recommended for NRHP nomination. As a guide to future research, I now compare project data to information from other drainages in northeastern Kansas.

Archaic

This preceramic time remains poorly understood throughout the region. Primarily, this is due to the deep burial of early and mid-Holocene sites in alluvial and colluvial settings and their too often deflated nature in uplands (Johnson and Logan 1990). This limited understanding also reflects dependence on a limited range of diagnostics, generally stemmed bifaces, and the uncertain affiliation of some of them (e.g., corner-notched and contracting-stemmed PPKs often assigned to the Woodland period). Until more sites of this period have been excavated and a wider range of their tool assemblages radiocarbon dated, this will continue to be the case.

In lowlands of northeastern Kansas, Archaic components may be exposed on stream banks, terrace scarps, and gully walls where erosion has exposed buried deposits. On terrace treads evidence of Late Archaic activity may be exposed due to deflation through long-term plowing and surface erosion. It is intriguing that the number of Archaic components found in the lowlands by the KATP investigation was

greater than that in the uplands, particularly since several tracts in the latter areas were included in the reconnaissance. In other drainages of northeastern Kansas, Archaic components are rare in valleys. For example, few have been recorded in the Delaware River drainage despite extensive surveys prior to reservoir impoundment of Perry Lake. Schmits (1987:209) identified 12 Plains Archaic components in the Perry Lake area and noted that all but two are in the uplands along the principal valley. In the Stranger Creek basin there are six known components of the Nebo Hill phase on terraces (Logan 1985:221), attesting to surface deflation there or to more shallow burial of Late Archaic sites. More recently, buried features at the Evans site (14LV1079), exposed in the stream bank and a chute along Stranger Creek, yielded radiocarbon dates of Middle and Late Archaic age (Logan 2003b).

Excavations at the DB site have shown that Archaic groups occupied seasonal camps on bluff tops along the lower Missouri valley and that, though subject to bioturbation, evidence of their settlements is preserved beyond the depth of agricultural disturbance (Logan 1998). Despite site disturbance by surface deflation and terracing seen at bluff top sites in the KATP project area (e.g., 14AT444), future testing at other sites in similar contexts will prove worthwhile.

It is apparent that extensive research of Archaic habitations is going to be more labor-intensive and, therefore, more costly than archeological work devoted to ceramic-age components. It will generally require coring and deep backhoe trenching in order to discover and trace sites and boundaries, as well as removal of a considerable amount of overburden to expose living areas. That said, the glimpse of preceramic occupation at some sites in the Independence and Deer Creek valleys, which was gained by the KATP survey, indicates that a closer look will be rewarding. Sites that also offer upper, ceramic-age components with high research potential, such as 14AT438, should be targeted as they promise discovery of stratified occupations.

Woodland

Woodland components are more numerous in the Independence Creek area than those of the Archaic period. However, we still know little about the Woodland groups that occupied them. Particularly striking is the impoverished Middle Woodland record compared to its richness elsewhere along the Missouri River valley in northeastern Kansas and northwestern Missouri (Johnson 1976b; Logan 2003a.). This may be due in part to the limited window of opportunity open for the KATP reconnaissance, during which small ceramic samples were recovered. Moreover, the comparability of Middle Woodland ware to those of the Nebraska phase in some attributes (plain surfaces, sand or grit temper, variable thickness) sometimes precludes confident assignment of Woodland components. The same may be said for Late Woodland components, generally recognized by relatively thick, densely grit-tempered, cordmarked pottery. In the absence of larger numbers of sherds, and particularly the more diagnostic rims, it is sometimes difficult to determine ceramic affiliations. Too often Woodland components in the project area are tentatively identified by rather generic bifaces, such as corner-notched and contracting-stemmed PPKs. For example, corner-notched PPKs are among the wide range of divergent types found in Late Archaic contexts in the greater Midwest (e.g., McElrath et al. 1984; McElrath 1986:51), and contracting stems are an attribute of some types (e.g., Gary) that first appeared during the Late Archaic (Justice 1987).

The sparse record of Middle Woodland sites may be due to site burial just beyond reach of the tilling that so often exposes evidence of later occupations. Prior to recent work along lower Stranger Creek, only six components of the Kansas City Hopewell variant had been identified in that watershed (Logan 1985:222). That number has been increased by discovery of Hopewell components at the Jacka (14LV1080) and Evans sites (Logan 2003a, 2003b). Scouring action during Stranger Creek flooding exposed both. Test excavations at the Evans site demonstrated that deposits beyond scoured areas are at a depth of 30-50 cm, that is, below the plow zone.

Not surprisingly, the number of Woodland sites in the valleys is greater than that in the uplands, no doubt reflecting more shallow burial of relatively younger sites. Most intriguing with regard to these sites is a distinct cluster at the confluence of Independence and Rock creeks. Such a concentration of occupations may reflect the "valley packing" attributed to an increased use of cultigens during Late Woodland and Late Prehistoric time (Adair 1988). Similar clustering of Late Woodland sites is seen in the Delaware River basin, with 115 components (Schmits 1987), and in the Stranger Creek watershed where 43 have been documented (Logan 1985). This may reflect a demographic shift following the abandonment of large base camps during Middle Woodland time in favor of smaller settlements along terraces (compare Johnson 1976b).

Late Prehistoric

Late Prehistoric sites in the Independence Creek drainage are well represented and identifiable by distinctive ceramics and such chipped stone tools as triangular arrow points, end scrapers, and alternately beveled knives. Their higher frequency on terraces, like that of Woodland sites, reflects relatively recent occupancy, shorter time for burial, and the "valley packing" phenomenon. Surprisingly, sites of this age in the Delaware River basin are not nearly as plentiful as those of the Woodland period. Twenty-five Late Prehistoric components were recorded there (Schmits 1987), compared to at least 40 in the Stranger Creek drainage (Logan 1985, 2001, 2002, 2003a).

The most intriguing aspect of these sites in the KATP project area is their ceramic assemblages that often exhibit a mixture of wares indicative of different archeological cultures. Late Prehistoric sites in the Delaware River basin more frequently are identified as Pomona. (The Keen site is an exception, having Steed-Kisker pottery interpreted by Witty [1983] as a local imitation of Platte Valley ware.) Those in northwestern Missouri are more easily assigned to the Steed-Kisker phase (but see the discussion of the Cloverdale site below), and those along the Nebraska-Iowa border clearly belong to the Nebraska phase. It is apparent in those areas that populations were characterized by a certain ceramic homogeneity. This is less clear in intervening areas, such as Stranger Creek and Salt Creek in Leavenworth County and Independence Creek in Atchison and Doniphan counties. It is possible that ceramic differences in those areas echo geographic proximity, reflecting the exchange of vessels or members (i.e., marriage) among groups on the periphery of archeologically recognized core areas. In that regard sites like 14AT438 in areas such as Independence Creek offer the best opportunity to address problems about ceramic variability as a function of group distance.

The Cloverdale site near St. Joseph is an extensive lowland occupation with a large ceramic assemblage of both Steed-Kisker and Nebraska wares. The mixture of pottery there may reflect the site's location in the northernmost range of the Steed-Kisker phase and the southernmost extent of the Nebraska phase. In effect the site is located where the core areas of both complexes overlap. I have suggested that sites characterized by such ceramic variation in intervening areas reflect the interaction of different populations in a shared "frontier" (Logan 1985, 1988a, 1990b). One example of this is the appearance of shell temper in some Pomona vessels in northeastern Kansas sites. That aplastic is not found in Pomona ceramics elsewhere in the variant's core area (Brown 1984). Beck (1995) has proposed a model that envisions overlapping exchange networks between groups, distributed like beads on a necklace, during Late Prehistoric time in the Central Plains. In that model, communication and information exchange occurs more frequently between adjacent communities, and this is reflected in material culture inventories. A hypothesis based on her model would predict a ceramic assemblage in the St. Joseph area like that from Cloverdale. Greatorex (1998) has suggested that the variable ceramics from Cloverdale could be evidence of a dual ceramic tradition practiced by a single group. In this scenario the site's occupants produced different wares for different purposes, much like some Southwestern groups made pottery for utilitarian functions and a different ceramic ware for mortuary use. My hypothesis, along with those proposed by Beck and Greatorex, could be tested at Late Prehistoric sites in the Independence Creek drainage that are characterized by variable ceramic assemblages.

Postlude

In 1804 Lewis and Clark and their hearty crew camped near Independence Creek and christened the stream in honor of our national holiday with a cannonade and extra gill of whiskey. In recounting this "first-ever Fourth of July celebration west of the Mississippi River," Ambrose (1996:149) suggested the lyrical (and atrociously spelled) description of Independence Creek quoted at the beginning of this article may have reflected a philosophical attitude "under the influence of the whiskey, as happens to young men carrying heavy responsibilities who find themselves in the Garden of Eden as dark comes on and the campfire burns down." Nearly 200 years later hearty members of the KAA, who may be viewed as another Corps of Discovery, fanned out to find evidence of past cultures around the site of the Kansa village at Doniphan whose ruins Clark described. More sober, no doubt, but equally philosophical, they were struck, through all the sweat and discomfort of fieldwork, by the beauty of the valleys and rolling hills. Ambrose (1996:149) suggested "the captains puzzled over why God had created such a place and failed to put Virginians in it, or put it in Virginia." Members of the KAA no doubt know it belongs just exactly where it is.

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Appendix.
Archeological Sites in Independence Creek Watershed

Site Number	Temporal Affiliation	Topographic Setting	Drainage
14AT101	Unknown Prehistoric	Terrace	Independence Creek
14AT102	Unknown Prehistoric	Hill Top	Independence Creek
14AT310	Woodland	Unknown	Independence Creek
14AT327*	Late Prehistoric	Ridge Top	Independence Creek
14AT434*	Archaic/Woodland/Late Prehistoric	Terrace	Deer Creek
14AT438*	Archaic/Late Prehistoric	Terrace	Deer Creek
14AT439	Woodland	Terrace	Independence Creek
14AT441*	Late Prehistoric	Terrace	Deer Creek
14AT444*	Archaic/Woodland/Late Prehistoric	Bluff Top	Independence Creek
14AT445*	Archaic/Woodland/Late Prehistoric	Bluff Slope	Deer & Independence Creeks
14AT446	Woodland	Hill Slope	Independence Creek
14AT447	Woodland	Hill Slope	Independence Creek
14AT448*	Archaic/Woodland	Toe Slope	Independence Creek
14AT449	Woodland	Terrace	Independence Creek
14AT450	Woodland	Terrace	Independence Creek
14AT451	Unknown Prehistoric	Ridge Slope	Deer Creek
14AT452	Unknown Prehistoric	Bluff Slope	Deer Creek
14AT453*	Unknown Prehistoric	Terrace	Deer Creek
14AT454	Unknown Prehistoric	Terrace	Deer Creek
14AT455	Woodland	Ridge Top, Ridge Slope	Deer Creek
14AT456*	Unknown Prehistoric	Hill Slope	Deer Creek
14AT457*	Archaic/Woodland	Bluff Slope	Deer Creek
14AT458*	Archaic/Historic	Bluff Slope	Deer Creek
14AT459*	Archaic	Ridge Top, Ridge Slope	Independence Creek
14AT460*	Archaic/Woodland/Late Prehistoric	Terrace	Deer Creek
14AT461*	Archaic/Woodland	Ridge Top	Deer Creek
14AT462*	Unknown Prehistoric	Bluff Slope	Deer Creek
14AT463*	Archaic/Woodland	Terrace	Deer Creek
14AT464*	Archaic/Woodland	Terrace	Deer Creek
14AT465*	Woodland	Terrace	Deer Creek
14AT466*	Unknown Prehistoric	Hill Slope, Ridge Toe	Deer Creek
14AT467*	Unknown Prehistoric	Hill Slope	Independence Creek
14AT468*	Unknown Prehistoric	Hill Slope, Ridge Toe	Deer Creek
14AT469*	Unknown Prehistoric	Hill Slope	Deer Creek
14AT471*	Archaic/Woodland/Late Prehistoric	Terrace	Deer Creek
14AT472*	Unknown Prehistoric	Ridge Top	Independence Creek
14AT473*	Unknown Prehistoric	Ridge Top	Independence Creek
14AT474*	Unknown Prehistoric	Terrace	Deer Creek
14AT475*	Woodland	Ridge Top	Independence Creek
14AT476*	Unknown Prehistoric	Terrace	Independence Creek
14AT477*	Unknown Prehistoric	Terrace	Independence Creek
14AT478*	Unknown Prehistoric	Terrace	Independence Creek
14AT479*	Historic	Terrace	Independence Creek
14AT480*	Archaic	Terrace	Deer Creek
14AT481*	Unknown Prehistoric	Hill Slope	Deer Creek
14AT482*	Historic	Terrace, Ridge Toe	Deer Creek
14AT483*	Unknown Prehistoric	Terrace	Deer Creek
14AT484*	Historic	Terrace	Deer Creek

14AT485*	Historic	Ridge Toe	Deer Creek
14AT486*	Archaic/Historic	Hill Top	Independence Creek
14AT487*	Historic	Ridge Slope	Independence Creek
14AT488*	Archaic	Ridge Top	Independence Creek
14AT489*	Late Prehistoric	Ridge Toe	Independence Creek
14AT490*	Archaic/Woodland/Late Prehistoric	Hill Top, Hill Slope	Independence Creek
14AT491*	Unknown Prehistoric	Ridge Top	Deer Creek
14AT492*	Unknown Prehistoric	Ridge Toe	Deer Creek
14AT493*	Unknown Prehistoric	Ridge Top	Independence Creek
14AT494*	Archaic/Woodland	Ridge Top	Deer Creek
14AT495*	Unknown Prehistoric	Terrace	Deer Creek
14AT496*	Unknown Prehistoric	Terrace	Deer Creek
14AT497*	Unknown Prehistoric	Terrace	Deer Creek
14DP002	Late Prehistoric/Protohistoric/Historic	Bluff Top	Missouri River
14DP029	Late Prehistoric	Terrace	Independence Creek
14DP030	Late Prehistoric	Terrace	Independence Creek
14DP031	Unknown Prehistoric	Terrace	Independence Creek
14DP032	Unknown Prehistoric	Terrace	Independence Creek
14DP105	Late Prehistoric	Terrace	Missouri River
14DP106	Unknown Prehistoric	Terrace	Independence Creek
14DP301	Unknown Prehistoric	Terrace	Missouri River
14DP302*	Late Prehistoric	Terrace	Independence Creek
14DP337*	Late Prehistoric	Terrace	Independence Creek
14DP343*	Archaic/Woodland	Terrace	Independence Creek
14DP344	Unknown Prehistoric	Terrace	Independence Creek
14DP383	Historic	Bluff Top	Independence Creek
14DP390*	Archaic/Late Prehistoric	Terrace	Missouri River
14DP392	Historic	Bluff Slope	Independence Creek
14DP401	Archaic	Terrace	Independence Creek
14DP402	Unknown Prehistoric	Terrace	Independence Creek
14DP403	Woodland/Late Prehistoric/Protohistoric	Bluff Top	Independence Creek
14DP404	Woodland/Historic	Terrace	Independence Creek
14DP405	Woodland/Historic	Terrace	Independence Creek
14DP406	Woodland	Terrace	Independence Creek
14DP407	Archaic	Hill Slope	Independence Creek
14DP408	Woodland	Stream Bank	Independence Creek
14DP409	Woodland	Terrace	Independence Creek
14DP410	Woodland	Terrace	Independence Creek
14DP411	Woodland	Terrace	Independence Creek
14DP412	Woodland/Historic	Terrace	Independence Creek
14DP413*	Archaic/Late Prehistoric	Terrace	Independence Creek
14DP414*	Woodland/Late Prehistoric	Terrace	Independence Creek
14DP415*	Unknown Prehistoric	Terrace	Independence Creek
14DP416*	Woodland/Late Prehistoric	Terrace	Independence Creek
14DP417*	Unknown Prehistoric	Terrace	Independence Creek
14DP418*	Unknown Prehistoric	Terrace	Independence Creek
14DP419*	Unknown Prehistoric	Terrace	Independence Creek
14DP420*	Woodland/Late Prehistoric	Terrace	Independence Creek
14DP421*	Archaic/Late Prehistoric	Terrace	Independence Creek
14DP422*	Late Prehistoric	Terrace	Independence Creek
14DP423*	Woodland/Late Prehistoric	Hill Top	Missouri River
14DP424*	Woodland/Late Prehistoric	Hill Top	Independence Creek
14DP425*	Late Prehistoric	Hill Top	Missouri River

14DP426*	Late Prehistoric	Terrace, Hill Slope	Independence Creek
14DP427*	Unknown Prehistoric	Hill Top	Missouri River
14DP428*	Unknown Prehistoric	Terrace	Independence Creek
14DP429*	Woodland/Late Prehistoric	Terrace	Independence Creek
14DP430*	Unknown Prehistoric	Hill Top	Independence Creek
14DP431*	Unknown Prehistoric	Hill Top	Independence Creek
14DP439*	Late Prehistoric	Terrace	Independence Creek
14DP440*	Woodland/Late Prehistoric	Terrace	Independence Creek
14DP441*	Archaic	Terrace	Independence Creek
14DP442*	Unknown Prehistoric	Terrace	Independence Creek
14DP443*	Unknown Prehistoric	Terrace	Independence Creek
14DP444*	Unknown Prehistoric	Terrace	Independence Creek
14DP445*	Unknown Prehistoric	Terrace	Independence Creek
14DP446*	Late Prehistoric	Terrace	Independence Creek
14DP448*	Unknown Prehistoric	Terrace	Independence Creek
*KATP site			

NOTES

A Nebraska Phase Occupation at the Leary Site

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The Leary site (25RH1) in southeastern Nebraska until now has been characterized as an Oneota site, based on the ceramic assemblage excavated in 1935 and 1965. This paper describes a second component found at the site, a Nebraska phase of the Central Plains tradition component, based on analysis of 84 Nebraska phase rim sherds. Analysis of 10 ceramic attributes, including temper, surface treatment, and rim form, was used to determine the presence of Nebraska phase ceramics at the Leary site.

The Leary site (25RH1) is located in southeastern Nebraska along the lowest reach of the Nemaha River, a tributary of the Missouri River (Figure 1). William Clark mentioned the site on July 12, 1804, in his account of the Lewis and Clark expedition (Moulton 1983:368). Early excavations at the site were conducted by Mark E. Zimmerman (1918) in 1918 and then again by E. E. Blackman in 1926 (Hill and Wedel 1936:10-13).

The first extensive excavation and subsequent report of the site took place in 1935 (Hill and Wedel 1936). Other excavations have occurred over the years, including another large-scale excavation by the Nebraska State Historical Society (NSHS) in 1965, an excavation in 1968 by a University of Kansas field school, and small scale salvage excavations by the NSHS in 1972 and 1979. Little formal analysis has been done on materials excavated from the site since 1935, except the thesis research done by Christine Garst (2002) and Lauren Ritterbush's (2002) ongoing work. Questions remain regarding the cultural affiliation of various components at the site. In Hill and Wedel's (1936) discussion of the Leary site, they labeled the materials as Oneota, based primarily on the ceramics, and subsequently the site has been thought of as an Oneota site.

Although there has been much interest in the site since 1935, many questions are still to be answered. The purpose of this paper is to characterize the Nebraska phase ceramics from the 1965 excavation.

1965 Investigation at Leary

During the summer of 1965, John Garrett and Wendell Frantz of the NSHS directed the excavation of a portion of the Leary site not excavated in 1935. (For a more complete background of investigations at the Leary site see Ritterbush [2002].) The crew uncovered a house, 30 pits, 3 burials, and other features (Frantz 1966:163; Ritterbush 2002:255, 257-260). Because of post-depositional disturbance and the excavation methods used in 1965, the exact plan and size of the house are impossible to define; however, the documented remains appear comparable to other Central Plains tradition houses (Frantz 1966:163). The structural remains suggested a roughly square pit with rounded corners, about 12 by 11 m (39 by 37 feet). Within this house were a scattering of post molds and a central hearth (Ritterbush 2002:257).

The house was associated with Central Plains tradition ceramics. Fifty-eight of the Nebraska phase rim sherds analyzed in this study were associated with the house. Oneota sherds also were recovered in this portion of the site, although it is impossible to determine whether they also were directly associated with the house. Although materials excavated over the years at Leary have led to the interpretation of an Oneota occupation at the site, this current analysis of the 1965 ceramics indicates a second component, representing

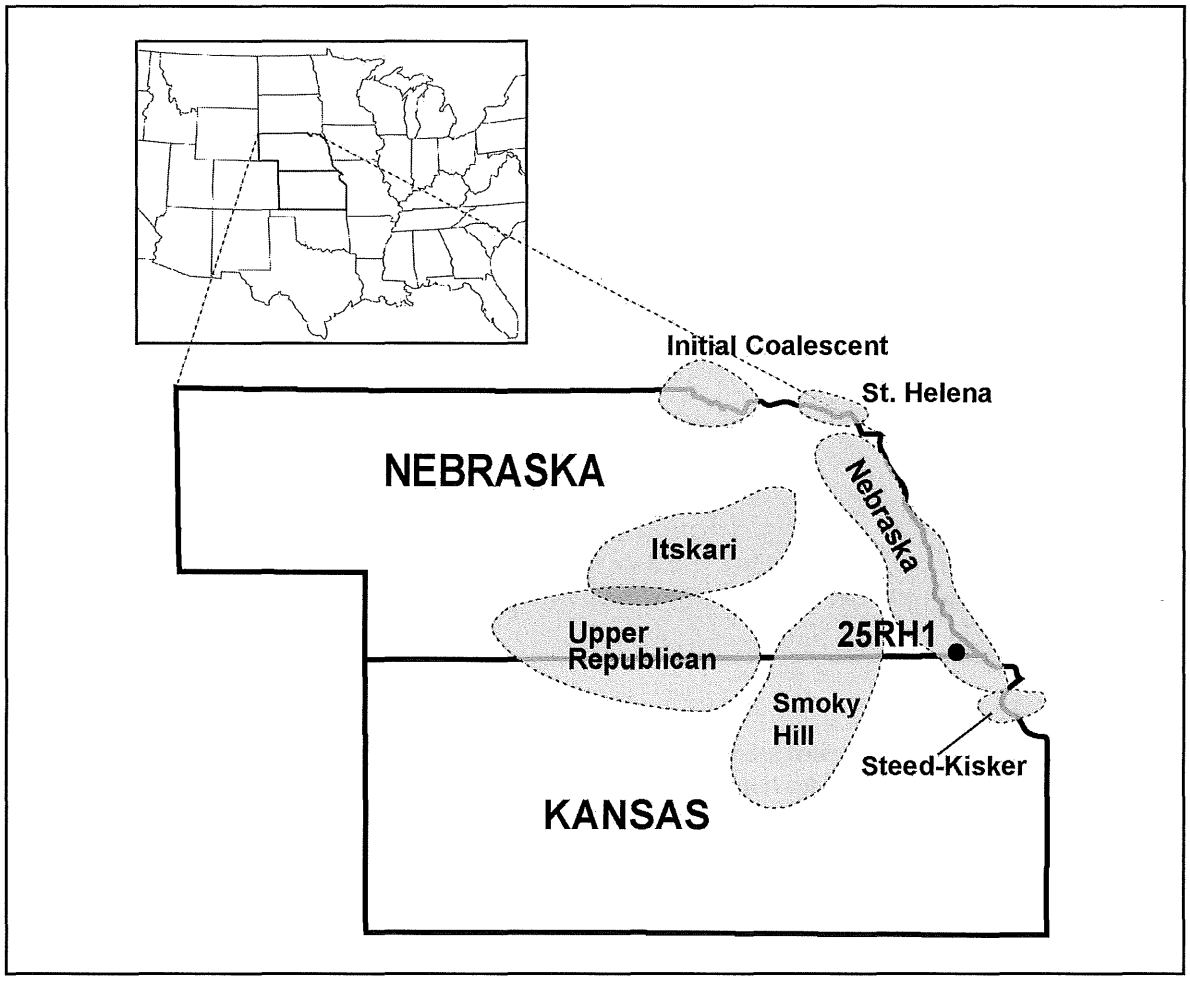

Figure 1. Location of the Leary site and Central Plains tradition phases. The distribution of Central Plains tradition phases is modified from Figure 8.1 in Steinacher and Carlson (1998:236).

a Nebraska phase occupation at Leary underlying the more prominent Oneota component (Frantz 1966:163; Hill and Wedel 1936).

History of Nebraska Phase Investigations

Robert F. Gilder (1926) was the first researcher to identify, describe, and label artifacts found in the area as the "Nebraska culture" (see also Strong 1933, 1935:48, 251). Although his contribution was important, his methods of excavation were inadequate. Gilder sparked the interest of Frederick H. Sterns (1915), who worked with the support of the Peabody Museum of Harvard University for three summers excavating many sites in eastern Nebraska. Sterns' contribution to the archeology of the area was establishing a cultural sequence that spanned the Woodland period to historic Pawnee. He improved upon Gilder's excavation techniques, which enabled researchers to recognize the rectangular houses now known to be typical for Nebraska phase structures and led him to call the Nebraska phase the "Rectangular Earth Lodge Culture" (Sterns 1915).

Because of coordinated programs by such important researchers as William Duncan Strong, Earl H. Bell, G. H. Gilmore, A. T. Hill, Waldo R. Wedel, and others, numerous sites in eastern Nebraska were heavily excavated throughout the 1930s. This led to many important breakthroughs in knowledge of the Nebraska phase. Coordinated excavations dropped off by World War II, and only scattered excavations have taken place in the area since (e.g., Blakeslee and Caldwell 1979; Bozell and Ludwickson 1999; Gradwohl 1969).

Description of the Central Plains Tradition

In light of current controversy surrounding taxonomic classifications for prehistoric period cultures in the Central Plains, traditional terms and classifications are used in this paper. Over the years these terms have been sufficient for understanding the regional archeological complexes, and using these terms allows an easier establishment of relationships between the Leary site and other contemporaneous prehistoric sites in and around the Central Plains. It is not the aim of this paper to introduce new typologies.

The Leary site falls within the spatial and temporal limits of the Nebraska phase of the Central Plains tradition, a late prehistoric cultural manifestation located within the Central Plains of the United States between A.D. 1000 and 1500 (Logan and Ritterbush 1994:1). Spatially, Nebraska phase sites are found in eastern Nebraska, western Iowa (termed the Glenwood locality), northeastern Kansas, and northwestern Missouri (Blakeslee and Caldwell 1979:20). Temporally, the Nebraska phase dates to about A.D. 1000 to 1450 (Blakeslee 1990:29). The Nebraska phase is one of several related phases of the Central Plains tradition found in the Central Plains region during the Late Prehistoric period. These phases include the Smoky Hill in north-central Kansas and south-central Nebraska, Upper Republican in northwestern Kansas and southwestern Nebraska, Itskari in central Nebraska, Steed-Kisker in the Kansas City vicinity, Nebraska in northeastern Kansas and eastern Nebraska, St. Helena in northeastern Nebraska, and Initial Coalescent variant in northern Nebraska (Figure 1).

The Central Plains tradition is defined archeologically from several shared material attributes found at many late prehistoric sites in this region. Inhabitants of these sites lived in "farmsteads" of one to a few houses. These houses were usually square or sub-rectangular, surface or semi-subterranean dwellings typically including four central support posts, a central hearth or fireplace, several cache pits located within the dwelling, and an extended entryway (Logan 1996:126; Wedel 1959:560-561, 566). These houses probably were wattle and daub construction, composed of clay pressed on the exterior of grass matting over a superstructure of small posts. These small house sites were located within river valleys, on ridge tops, and on lower terraces (Blakeslee and Caldwell 1979:27; Strong 1935:263-265).

Subsistence was that of a horticultural/hunter-gatherer diet, including domesticated plants, such as corn, beans, squash, marsh elder, and sunflower (Billeck 1993:2; Gradwohl 1969:115). The people also used wild plants, such as berries, nuts, and roots; small game; fish; waterfowl; and larger game, such as deer and bison (Wedel 1959:558-562). Artifacts found at Central Plains tradition sites include chipped stone tools, such as small triangular unnotched or side-notched projectile points, knives, and scrapers; ground-stone artifacts, such as manos and metates, celts, and axes; and bone tools, including awls and scapula hoes (Strong 1935:260-262; Wedel 1959:561, 566).

Artifact assemblages recovered from sites assigned to various phases of the Central Plains tradition are very similar and provide few clear means of distinguishing between the different phases. Ceramic subassemblages are often used to distinguish between the phases (Greatorex 1998:1; Wedel 1959:562). In general, ceramic attributes vary with location or phase. Nebraska phase ceramics are globular jars or bowls with grit or sand temper and surface treatments of cordmarking or smoothed-over (sometimes to obliteration) cordmarking. Decoration on Nebraska phase vessels is not noted to the degree that it is in other areas, but it does occur, typically on the rim in the form of pinching or vertical tool impressions. Sometimes shell tempering is found at Nebraska phase sites, but generally not in the abundance of grit or sand temper (Blakeslee and Caldwell 1979:75; Strong 1935:251-252; Wedel 1959:561, 566). The study of artifact assemblages sometimes is used to elicit the social frameworks of past societies, but ceramics are often viewed as reflecting a group's cultural identity.

Blakeslee and Caldwell (1979) examined materials from 31 Nebraska phase sites and, using statistical methods, established a temporal and spatial seriation for Nebraska phase ceramics. They used three dichotomies to account for the variability in their sample: direct versus thickened (or collared) rims, plain versus decorated rims, and tool-decorated versus finger-decorated rims. Blakeslee and Caldwell found that the proportion of direct to thickened rims and plain to decorated rims had chronological significance, while the method of applying the decoration (tool versus finger) generally did not. Blakeslee and Caldwell correlated the ceramic seriation with available radiocarbon dates and came to the conclusion that sites lying in the southern Nebraska phase area are temporally earlier than those in the north and typically have a higher proportion of direct, plain rims. The later northern sites have a higher proportion of collared and decorated rims (Blakeslee and Caldwell 1979:108). Radiocarbon dates for the southern Nebraska phase sites

are about 900-700 radiocarbon years ago. Dates for the northern sites are generally later in time, occupied about 775 radiocarbon years ago (Blakeslee and Caldwell 1979:108). From these data Blakeslee and Caldwell postulated a south to north movement through time.

Methods

The current analysis of the ceramic sherds recovered from the 1965 excavation at Leary included those at the Kansas State University (KSU) Archaeology Lab on loan from the NSHS in 1999. It is known that some have been repatriated and some lost during curation or storage. Although all sherds were fully examined, this paper summarizes the analysis of only the 84 rim sherds attributable to the Nebraska phase, based on the presence of cordmarking, grit or sand tempering, and rim form.

All sherds first were separated into rim (based on the presence of an identifiable portion of the lip), body (any sherd with no lip remaining), and handle only (sherds without any portion of rim or body present). Cross mending was attempted as time permitted, and cross-mended sherds were considered as a single sherd. All sherd edges were inspected for temper identification. No fresh breaks were made, as it was felt that this was too destructive. Temper of each sherd was identified under low power magnification (no more than 10X). If determination was difficult, the edge was brushed lightly with a soft brush and examined under a low power (10X) binocular microscope. If inclusions were still not discernable, the sherd temper was categorized as "unknown." Temper classes included shell, grit, sand, and hematite, or a combination of any of these. Surface treatment was identified for all sherds and was broken down into cordmarked, smoothed-over cordmarked, smooth, polished, or slipped. The next analysis phases noted vessel form, rim form, and rim type; identified rim decoration; and recorded metric measurements of the rim and shoulder when applicable.

Explanation of Attributes

Temper. Temper is understood as aplastic inclusions added to the clay in order to bind the material to prevent breakage in the ceramic vessel from thermal shock (Bronitsky and Hamer1986:90; Shepard 1964:518). Clay naturally contains materials such as sand, rock, and iron oxides, although some of these inclusions could be purposefully added. All inclusions were identified as temper if at least three particles of material were found in any given sherd edge.

Sand and grit temper was differentiated on the basis of material and angularity of particles; sand is rounded quartz particles, while grit is angular crushed rock. In the area of the Leary site, grit probably was derived from local glacial till debris, including feldspars, quartz, gypsum, limestone, pyrite, and others. Most of the stone tempering material was somewhat angular, although the edges might be slightly rounded.

Some sherd tempers were clearly sand or clearly grit, but in many sherds the distinction was difficult to discern. The determination between the grit and sand was based on a single analyst's interpretation of relative angularity and material composition in comparison to that of the other sherds in the collection. Because of the difficulty in separating these two temper types in this assemblage, they might be combined into a single category for stone temper. Shell was identified by the presence of white, flat, layered particles or flat voids.

Iron oxide is found naturally in the region's sediments. Round particles, often dark red, brown, or black in color and relatively soft, were noted in many of the Leary site sherds. These particles were identified as iron oxide, called "hematite" since that is the most stable form of iron oxide and a term commonly found in the archeological literature. In the past hematite has not typically been identified as temper, although sometimes it has been noted as naturally occurring in the ceramic paste. However, as stated earlier, because it is unknown whether it was purposefully added, it was included as temper.

The identification of iron oxide, likely hematite, was confirmed by four x-ray diffraction measurements taken on three sherds collected from the surface of the Leary site in 1968 (KSU Archaeology Lab catalogue numbers 24224, 24350, 24330, 24330A). As x-ray diffraction is a destructive process, only three sherds were tested. These specimens were chosen based on size (those too small to yield much other information), absence of decoration, and presence of what was identified macroscopically as hematite. In two of the sherds, dark red/brown particles were seen on the edge and the surface of the sherd, which was otherwise shell tempered. To serve as a control, a third sherd was selected based on the apparent absence of any red/brown particles. This control sherd was grit tempered. The three sherds were pulverized into a fine powder that was submitted for x-ray diffraction. One of the sherds presumed to have hematite (24330) was broken with a hammer to extract some of the red/brown particles (24330A), which were pulverized separately to raise the percentage of this

material and enable a stronger reading by x-ray diffraction. Results from sample 24330A did suggest the presence of hematite. The x-ray diffraction was accomplished under the direction of Dr. Mickey Ransom in the KSU Agronomy Department. The author analyzed the results with Dr. Ransom's help.

Surface Treatment. Surface treatment was examined on both body and neck surfaces. Cordmarked surface treatment was identified by the presence of regularly or irregularly placed cordmarks, presumably left by a cord-wrapped paddle during final shaping of the vessel (Blakeslee and Caldwell 1979:53; Strong 1935:252). Cordmarking is not a decoration, but rather a technological attribute indicating how the vessel was formed.

Smoothed-over cordmarked surface treatment was identified by the presence of cord impressions that appeared to have been smoothed, although the actual twist in the cord was still visible. The degree of smoothing varied from just the tops of the ridges between the cord marks to almost complete obliteration with only one or two cordmarks visible. Smooth surface treatment was identified by the total absence of any cordmarks, leaving a smooth, even surface.

Polishing was identified by a reflective surface on smooth ceramic sherds. A thin layer of clay applied to the surface of a vessel, presumably after the vessel was formed, identified a slipped surface treatment. A slip can be recognized by a difference in color on the surface of the sherd, sometimes seen in cross section on the edge of the sherd as a thin, distinct layer. Polished and slipped surface treatments were seen in only a small fraction of the sample and were not considered significant attributes in this assemblage.

Appendages/handles. Appendages included lug, strap (wider that they are thick), loop (relatively similar in width and thickness), and tab handles, as well as effigy heads, tails, etc. The presence or absence of appendages was noted, including handle scars, when it was clear that an appendage had broken off.

Vessel Form. Two forms were recognized: jars and bowls. A jar was defined as any vessel with a constricted neck and a rim extending above the neck. A bowl was defined as any vessel with a straight to inverted wall, lacking a neck.

Rim Type. Three rim types were recognized: unthickened (direct), thickened (collared or s-shaped), and bowl. These types correspond loosely to the ceram-ic typology developed by Gunnerson (1952). He defined the McVey (unthickened or direct), Beckman (collared), Swoboda (s-shaped), and Debilka (bowls) groups of pottery types. Ives (1955) and Adrian and Barbara Anderson (1960) later modified Gunnerson's types. Over the years these classifications have proved to be inadequate (Blakeslee and Caldwell 1979). This author does not use these terms, instead simply differentiating between unthickened and thickened.

Table 1. Temper and Surface Treatment (N=84).

Temper	N	%
Grit	62	74
Grit and hematite	10	12
Grit and shell	1	1
Hematite	2	2
Sand and hematite	1	1
Shell and hematite	3	4
Unknown	1	1
Neck surface treatment		
Cordmarked	5	6
Smooth	45	54
Smoothed over cordmarked	34	40

Table 2. Apendages and Vessel Form (N=84)

Rim type	N	%
Unthickened	80	100
Thickened	0	0
Decoration		
Finger-decorated	19	24
Tool-decorated	11	14
Undecorated	48	60
Unknown	2	2

Rim Decoration. The presence of decoration was noted, as well as its placement on the rim. Two types of decoration were recognized: tool and finger decoration.

Rim Height. Rim height was considered as the perpendicular distance between the lip and the interior inflection point of a jar with the rim in its proper orientation. Rim height was measured in millimeters.

Rim Thickness. The thickness of a rim was taken 5 mm below the vessel lip, measured in millimeters.

Rim Diameter. Rim diameter was determined by aligning the curvature of the lip on a diameter chart. The author determined that a rim sherd must be at least 3 cm in length to reflect actual diameter. The measurement was made in centimeters.

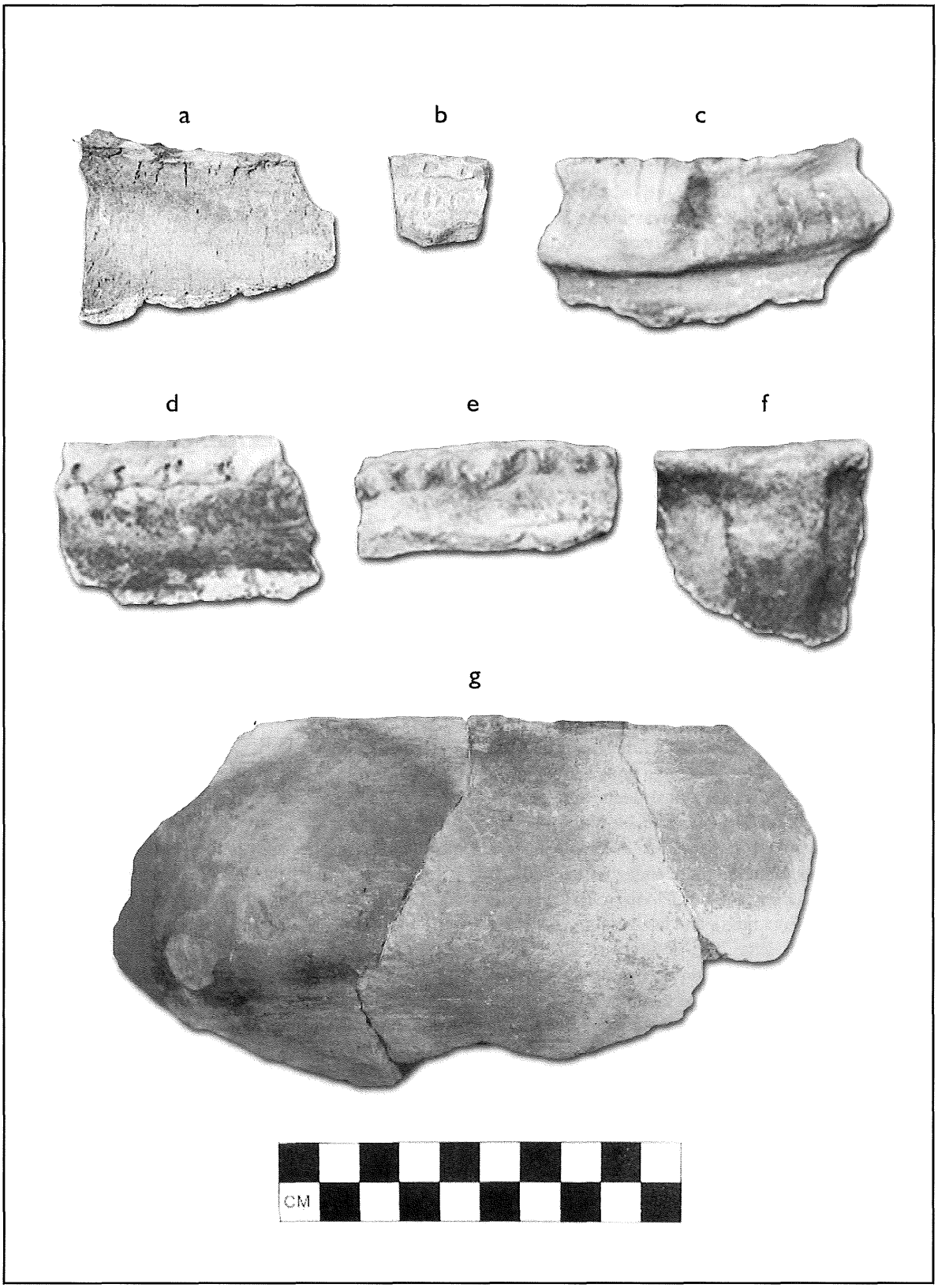

Figure 2. Examples of Nebraska phase ceramics found at the Leary Site in 1965. (Photos taken by author.)

Table 3. Rim Type and Decoration (N=80).

Rim type	N	%
Unthickened	80	100
Thickened	0	0
Decoration		
Finger-decorated	19	24
Tool-decorated	11	14
Undecorated	48	60
Unknown	2	2

Shoulder Diameter. Shoulder diameter was measured when a sufficiently large portion of the vessel was present to indicate the maximum circumference of its body. The measurement, taken in centimeters using a diameter chart, was made at the maximum point of the vessel body.

Results

The 1965 ceramic assemblage consists of 6,033 sherds. Of these, the Oneota subassemblage contains 4,647 body sherds and 548 rim sherds. The Nebraska phase subassemblage contains 754 body sherds and 84 rim sherds. The distinction between the two subassemblages was made based primarily on temper and surface treatment, with the Oneota sherds characterized by shell tempering, smooth surface treatment, and shoulder, neck, and rim decoration. Sand or grit tempering, cordmarked surface treatment, and rim form characterized the 84 Nebraska phase rim sherds that were the focus of this study.

The results of the temper and surface treatment analyses are given in Table 1. The most prominent temper of this assemblage is grit (n=62), comprising 74 percent of the rim sherds. The second most common temper is grit and hematite (n=10). Other tempers in this assemblage are grit and shell (n=1), hematite (n=2), sand and hematite (n=1), shell and hematite (n=3), and one unknown temper.

Only 27 of the rim sherds had enough body surface to identify treatment (Figure 2a). Therefore, the results given in the table are the surface treatments for the neck surfaces, of which 12 were smooth, 11 were smoothed-over cordmarked, and 4 were cordmarked. For the neck surfaces the most extensive treatment is smooth (n=45), which was used on 54 percent of the sherds. The second most extensive surface treatment is smoothed-over cordmarked on 40 percent (n=34) of the rim sherds. Cordmarked surface treatment is found on 5 percent (n=5) of the rim sherds.

The rim sherds of this assemblage represent both jars and bowls (Table 2). Of the 84 rim sherds, 4 are presumed to be bowls, identified by straight to inverted walls and no constriction of the neck. Three of the bowls have smooth body surfaces, and the fourth has a smoothed-over cordmarked body surface. None exhibit decoration or appendages. All are grit tempered (Figure 2g).

The remaining 80 sherds were identified as jars. The results of rim type and decoration analyses are given in Table 3. Of the 80 jars examined, all have unthickened rims. Thirty (38 percent) have decorated rims, and 19 of these are finger decorated, which in all cases involved pinching around the external rim/lip juncture (Figures 2b, d, and e). Tool decoration appears on 11 rim sherds of which 10 are tool-impressed on the exterior rim/lip juncture. Two tool-decorated rims exhibit crosshatching, also on the exterior rim/lip juncture. One tool-decorated rim sherd exhibits an unthickened S-shaped profile with trailed lines in a style reminiscent of Oneota decoration (Figure 2c), although the S-shaped profile is understood as being a Central Plains tradition attribute (Gunnerson 1952). The distinction between finger and tool decoration was based on the presence of fingernail or other identifiable finger impressions. Most of these tool-impressed rims may actually be finger pinched, but the author could not discern any identifiable finger impressions.

The remaining 48 (65 percent) plain (undecorated) rims include six specimens that exhibit rolled rims with very low, thick profiles. As they do not exhibit a traditional collar, these still are characterized as unthickened.

Handles were noted in 10 instances (12 percent) of the 84 rim sherds (Table 2; Figure 2f). Four of these are undecorated strap handles, two are undecorated loop handles, and two are scars. Two handles are decorated: one vertically perforated lug is on one of the crosshatched incised sherds and a strap with three vertical trailed lines is on the S-shaped rim sherd. All of the handles are either molded from the lip or at the lip.

Discussion

The purpose of this analysis was to characterize the Central Plains tradition ceramic assemblage at the Leary site. The pottery from the Leary site is typical of a Nebraska phase occupation. First, the temper is primarily grit (74 percent). Second, the primary surface treatment is smooth (54 percent), which often is seen in Nebraska phase assemblages; and the next most

Table 4. Radiocarbon Dates.

Lab Number	Sample Material	Radiocarbon age and standard deviation (RCYBP)	One sigma calibrated date range (Method A)	Two sigma calibrated date range (Method A)	References
SI-618		1170 +/- 60	A.D. 778-962	A.D. 690-998	Stuckenrath and Mielke 1972:405
SI-617	Charcoal	620 +/- 100	A.D. 1284-1416	A.D. 1220-1449	Stuckenrath and Mielke 1972:405
BGS 2301	Charcoal	641 +/- 40	A.D. 1295-1393	A.D. 1283-1404	Ritterbush 2002:260
BGS 2302	Charcoal	548 +/- 40	A.D. 1329-1423	A.D. 1304-1438	Ritterbush 2002:260

frequent surface treatment is smoothed-over cordmarked (40 percent), which is a definite Nebraska phase trait. Third, 38 percent of the assemblage consists of decorated rim sherds, of which most exhibit pinching or vertical tool impressions. Frequency of rim type and decoration of jars are spatially and temporally sensitive, according to Blakeslee and Caldwell's (1979) Nebraska phase ceramic seriation. The entire assemblage of rim sherds is comprised of unthickened rims.

A small sample of unusual or anomalous sherds is present in this subassemblage. What these sherds represent is unknown. The anomalous sherds could show a possible connection with or influence by a contemporaneous group, or they could simply be a representation of the possible variation within a ceramic assemblage. In this sample are the two sherds that exhibit incised crosshatching. One has the vertically perforated lug. Although the two specimens do not crossmend, they may be from the same vessel, based on decoration and color. Another unusual sherd is the S-rim with shell and hematite temper and a decorated strap handle. This sherd was included in the anomalous group based on the S-shaped rim profile, reminiscent of Gunnerson's (1952) Swoboda type; however, this sherd is not thickened. Its decoration is consistent with that of the Oneota assemblage at the site, having oblique and vertical tool-trailed lines on the lip top and neck surface. Based on the fact that there is at least one Oneota component at the Leary site, this sherd could be included with the Oneota subassemblage. Completing the sample of anomalous sherds are the six sherds that exhibit low, thick, rolled rims. Clearly more analysis at this site is called for to obtain a more complete understanding of the connections of Leary site occupants with other groups.

There are seven radiocarbon dates available for the Leary site (Table 4). Three of these dates were associated with Oneota ceramics and are not considered further here (Ritterbush 2002). The remaining dates (SI-617, SI-618, BGS-2301, and BGS-2302) were obtained from charcoal from the house postmolds excavated in 1965. Bozell and Ludwickson (1999:102-105), who analyzed SI-617 and SI-618, rejected one of these dates outright as too early for a Nebraska phase occupation. They suggested that post-excavation contamination might be responsible for the anomalous date and that this might require the omission of the second date obtained from similar material. However, two samples of charcoal assayed in 2000 (BGS-2301 and BGS-2302) confirm the latter date. The three dates that appear sound fall into the Late Prehistoric period, which is suitable for a Nebraska phase (or Oneota) component (Ritterbush 2002:260-261).

Sites that date to a later time period more commonly are associated with sites in the northern area of Nebraska phase occupation, according to Blakeslee and Caldwell. In addition, they suggest that the later northern sites have higher proportions of collared rims. This ceramic subassemblage contains no collared rims, although the available radiocarbon dates suggest a late (post-A.D. 1250) Nebraska phase occupation, and the site is one of the southernmost Nebraska phase sites, indicating, according to Blakeslee and Caldwell, an early occupation.

Conclusion

The 1965 Leary site ceramic assemblage clearly includes a Nebraska phase component, based on analysis of attributes such as temper, surface treatment, rim form, rim decoration, and rim type. The Nebraska phase assemblage from the Leary site is made up entirely of unthickened rims, which according to Blakeslee and Caldwell's seriation place it temporally early in the phase. The proportion of plain (60 percent) versus decorated (38 percent) rims is very close to what Blakeslee and Caldwell predicted for an early

Nebraska phase site. Blakeslee and Caldwell also stated that early sites cluster in the southern portion of the Nebraska phase area. Leary is one of the southernmost Nebraska phase sites. Thus, the Nebraska phase component at the Leary site appears to fit spatially and stylistically with the early Nebraska phase sites. However, three radiocarbon dates currently available from this component are later than Blakeslee and Caldwell's proposed time period for early southern sites.

In sum, the Nebraska phase component at Leary may represent an anomalous occupation with early ceramic and spatial attributes, although dating later temporally. Alternatively, it could be that Blakeslee and Caldwell's model does not accurately reflect movement in the past because either their sample was too small or it was otherwise not representative. The Leary site has much to offer future research for more clearly understanding the dynamics operating within this site and its associations or interactions with other contemporaneous sites. Clearly more analysis is called for both in the Nebraska phase and Oneota subassemblages at the Leary site in order to further understand the complexities of this and other late prehistoric sites.

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The 1970 Excavation at 14SA415: A Smoky Hill Phase Lodge

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The Kansas Anthropologist 23:45-67

Site 14SA415 is one of numerous Smoky Hill phase lodge sites in the Salina area. A 1970 excavation on this site uncovered a single lodge and recovered a large number of ceramic, chipped stone, ground stone, and bone artifacts. The ceramics are of particular interest, for they share microstylistic commonalities with the pottery from other nearby sites, including several excavated lodges and the Indian Burial Pit, and they contrast, in a microstylistic sense, with Smoky Hill phase lodges in the Solomon River valley. Newly obtained radiocarbon dates reported here suggest that this is not a matter of change over time. Rather, the ceramic distribution patterns might suggest an identifiable thirteenth-century community in the present Salina area.

Archeological site 14SA415 is one of numerous Smoky Hill phase sites that Harold Reed has recorded in the greater Salina area through the years. Reed recorded this particular site in March 1970. It was not then certain that the site contained houses, but the site form notes that Reed intended to try to find a house there and that he had permission from the landowner to do so. He succeeded in his search in early April of that same year, and, with Margie Reed and Earl and Iris Monger, he began excavating the house shortly thereafter, working on weekends through the months of April and May and into June.

Around the time Reed was beginning this excavation, Tom Witty was trying to locate a Smoky Hill phase lodge in the Salina area that the Kansas Anthropological Association (KAA) could excavate during its annual spring dig. He had spent some time in March examining fields surrounding the nearby Whiteford site or Indian Burial Pit (14SA1), trying to find houses. This was a logical area to be looking for Smoky Hill phase lodges, for this is the Kohr site (14SA414) where Guy and Mabel Whiteford, the excavators and first proprietors of the burial pit, excavated two lodges in the late 1930s (Roper 2001:92-116). At that time the Whitefords stated that surface indications of as many as 12 to 15 lodges could be observed in the fields surrounding the cemetery (Whiteford 1941:18; see also Wedel 1959:512-513). Witty and others did find an area where charcoal and mixed soil might indicate the presence of a house. The plan, then, was to excavate the presumed house during the four-day KAA spring dig in June 1970. Inexplicably, however, tests placed into this debris scatter on the first day of the project showed that it was something other than a house (although what that "something other" was has never been assessed). The Reeds were still working on the 14SA415 house and offered it for the remainder of the KAA project. Accordingly, KAA members completed the house excavation during some of the last days of June 1970 (Witty 1970). In all, the house was almost completely excavated. Post molds were cored, and two cache pits and a basin were exposed, but the central hearth, located early in the project, never was excavated. Also during the KAA portion of the project, Kansas State Historical Society (KSHS) archeologist John Reynolds used a plane table and alidade to prepare a lodge floor plan.

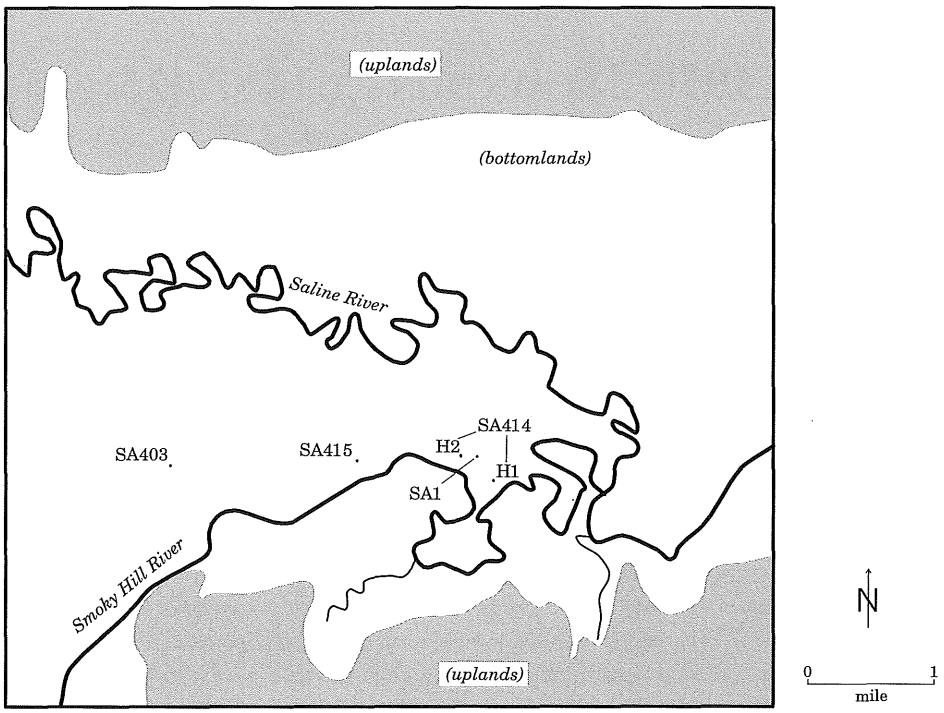

Figure 1. The location of 14SA415 and other lower Smoky Hill River valley sites mentioned in the text (base map = 1:100,000 Saline County Quadrangle, 1980).

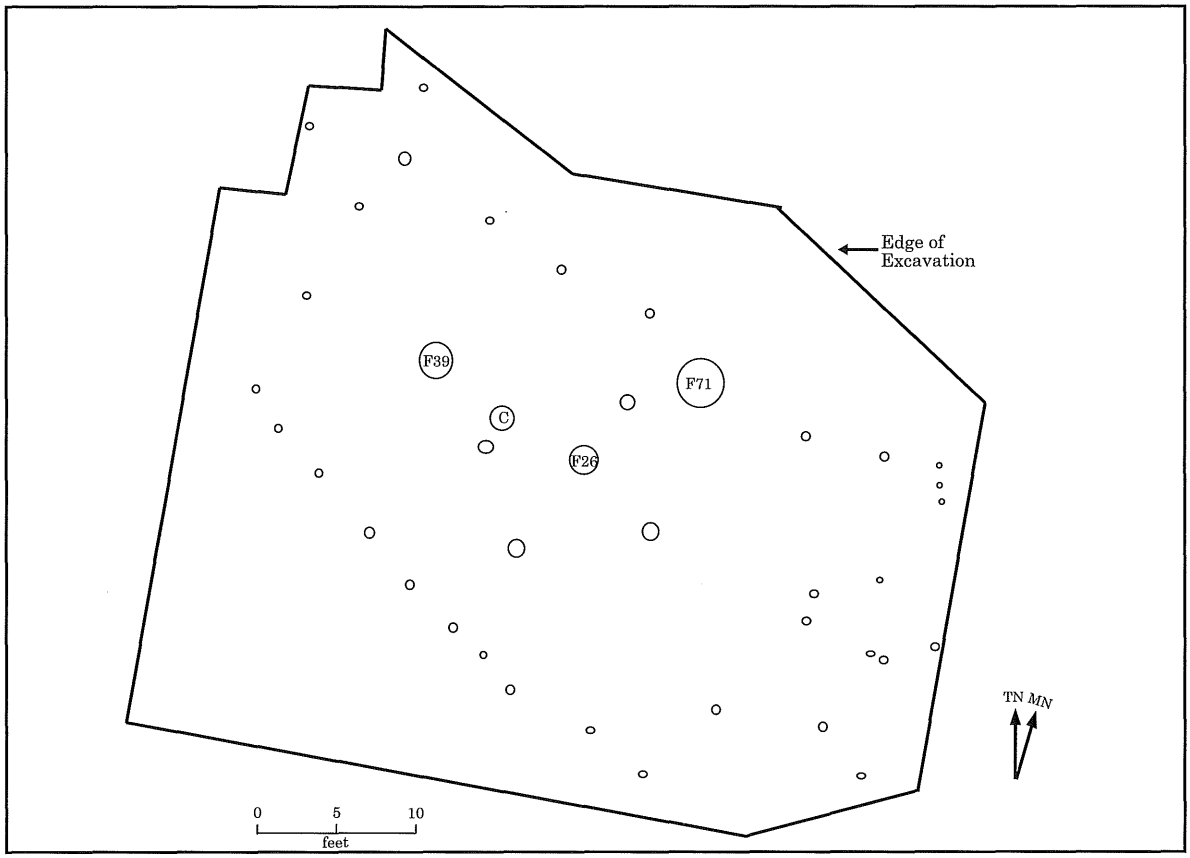

Figure 2. Excavation and house floor plan.

Most of the collection from the site, which is on private land, remains in Reed's possession; a few objects are in the KSHS collections in Topeka. Stimulated by Roper's (2001) recent report of the Whitefords' excavation at the Kohr site, as well as several sites in the Minneapolis area of the lower Solomon River valley of Ottawa County, Reed contacted Roper in the fall of 2002 to discuss comparisons of the 14SA415 lodge with lodges that the Whitefords had excavated. Reed made the point that the 14SA415 house had some unusual characteristics, most particularly that the arrangement of the interior support posts was diamond-shaped—that is, the sides of the square formed by the internal support posts were at an angle to rather than parallel to the house walls. Reed indicated that the site needed to be written up, and Roper agreed to do so. This report is the result of that collaboration.

Site Description and Setting

The excavated lodge described here is part of a site that occupies an estimated 2 to 6 acres on a terrace adjacent to and within a long, narrow meander loop of the Smoky Hill River. The lodge location is about 4,000 feet west of 14SA1. It is 3,800 or so feet west of Kohr House #2 and 5,500 feet northwest of Kohr House #1 on 14SA414. The Winslow site (14SA403), another excavated Smoky Hill phase lodge (Witty 1968), is about 7,700 feet west of the 14SA415 lodge (Figure 1). Other unexcavated lodges are present at some of these same sites, as well as other sites recorded in this locality. Inasmuch as the environmental setting of this portion of the Smoky Hill River valley is described in great detail in the report of the Kohr house excavations (Roper 2001:86-92) and in a study of the Indian Burial Pit (Roper 2003:Chapter 2), only a few details specific to 14SA415 are highlighted here.

The site is in the middle of the combined Smoky Hill River/Saline River valley, just under 2 straight-line miles above (i.e., west of) the point at which the Saline River presently flows into the Smoky Hill River. The valley here is about 4 miles wide, north to south. Parts of this segment of the Smoky Hill River are artificially channelized, but prior to being rerouted and in areas not so altered, the river was/is highly sinuous, flowing within a meander belt about 1 mile wide. Abandoned meander scars are abundant on the floodplain. The bottomlands, therefore, are a mosaic of the modern floodplain and late-Quaternary (Holocene and Wisconsinan) terraces (Cline 1974; Latta 1949). These terraces, like the floodplain, occasionally are dissected by the remnants of cutoff river meanders.

Site 14SA415 lies on one of the broad, low Holocene-age terraces. It is on the north side of the Smoky Hill River at an elevation of about 1,200 feet above mean sea level, which is about 12 or so feet above the river. It is within the now-shallow swale that cuts across a large terrace exposure and represents a long-since cutoff river meander. The mapped soil series is the Roxbury silt loam, a deep alluvial terrace soil (Palmer et al. 1992:sheet 13). The land currently is cultivated, except for a narrow timber belt adjacent to the old river channel. Prior to Euroamerican agriculture and at the time of the 1858 General Land Office (GLO) survey, the area was a prairie with timber—described in the GLO survey notes for this township as cottonwood, elm, and oak—lining the riverbanks. Thus, as were the houses on the Kohr site and other Smoky Hill phase house sites, the 14SA415 house was positioned so as to have ready access to water, wood, good soils for agriculture, wild and weedy edible plants, and the diverse fauna of the river, riverbank, and river bottomlands.

The Excavation

The excavation at 14SA415 began on April 6, 1970, when Reed placed a 2.5-x-2.5-foot excavation unit over an area suspected to contain a house. Burned earth, charcoal, pottery, chipped stone artifacts, debitage, and mussel shell were quickly encountered, indicating that a house likely was present. With those results in hand, Reed laid a grid of 10-x-10-foot squares over the area, giving each square a number corresponding to the number of the stake at its southwest corner. A datum placed at the southwest corner of the original 2.5-x-2.5-foot test unit, stake 13, served as the datum for the entire excavation. As it turned out, this datum, and consequently the original test pit, were quite near the center of the house.

Excavation followed over the next three months. The entire house was exposed in an irregularly shaped excavation area of just about 2,000 feet^2 (Figure 2). The outmost entryway posts, however, were at the edge of the excavation, indicating that the limits of the entryway may or may not have been encountered. Excavation proceeded by shovel skimming without screening of the fill. Some objects were piece plotted when they were encountered. Following KSHS standard procedure, piece plots were referred to and treated in the records as features. In this report, however, they are referred to as piece plots, with the term feature reserved for post molds, pits, and the hearth. Other objects had a provenience no more specific than house fill, plow zone, or, occasionally, surface. Post

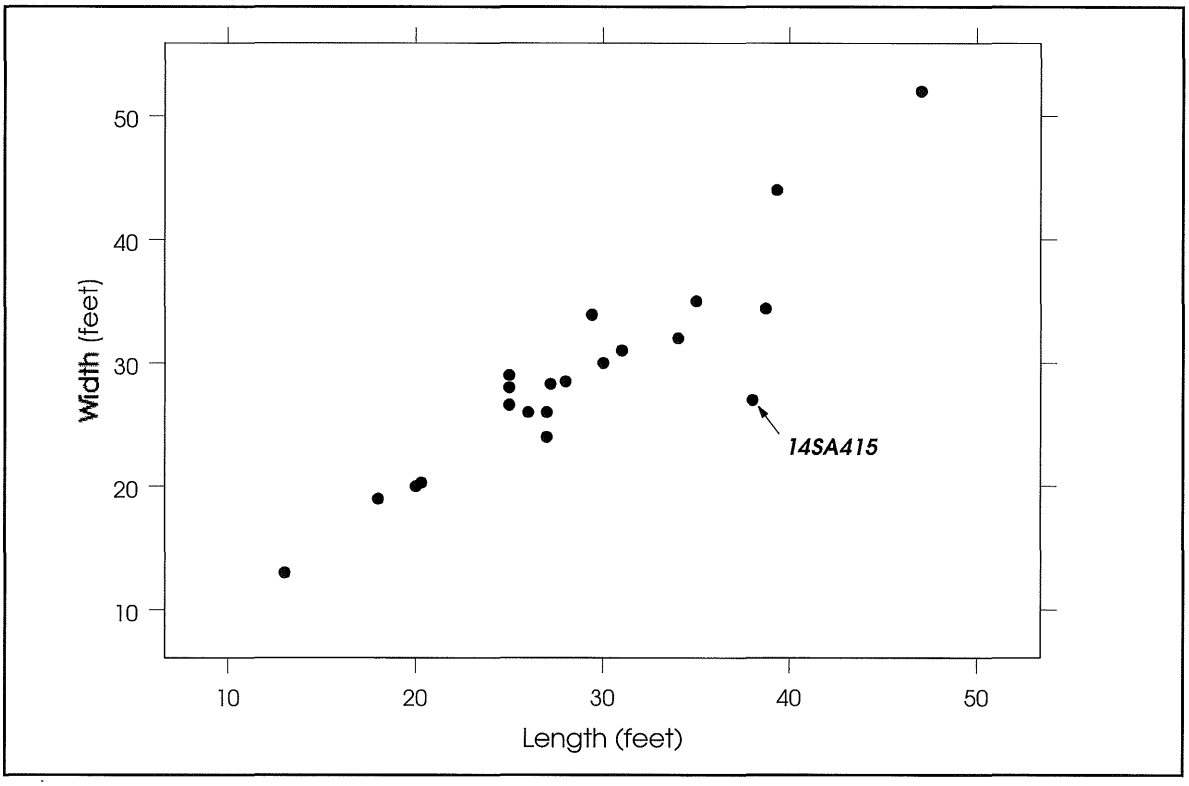

Figure 3. Lengths, widths, and proportions of excavated Smoky Hill phase lodges.

molds, which were not assigned feature numbers, were excavated, as were cache pits, which do have feature numbers. Post mold and cache pit fill was not screened. Post mold diameters and depths were measured, they were flagged, and their locations were plotted with a plane table and alidade. Cache pit plan view and profile sketches were made when these features were excavated; their locations were later plotted with the plane table and alidade.

Several types of excavation records were kept. Each feature (piece plot, cache pit) has a record sheet, and several other record sheets describe the site, site datum, and soils. A sketch of the grid shows grid orientation and layout and describes the numbering and recording system. Piece-plot record sheets give coordinates of the items within their squares. Cache pit record sheets include coordinates and dimensions and also have profile sketches. These latter are sketches only and are not scaled drawings. Photographs include both black-and-white prints and color slides. Reynolds' plane table map of the house is a part of the records.

The material recovered from the 14SA415 house was washed and catalogued within two months of completing the excavation, except for the few pieces at the KSHS that were catalogued several years later. Each object was given a catalogue number. These numbers, along with provenience information, were written on the artifacts. A typed catalogue was prepared and is a part of the site records.

John Reynolds did the instrument work to prepare a site map on June 28, 1970. The map that he produced at that time actually is a plot of numbered alidade shots, with circles added for the post molds and some of the other features, and an outline of the edge of the excavation. With the map is a list of shots, by number, with a description of the point shot in, e.g., a post mold, a square corner stake, and so forth. Depths and diameters of post molds were recorded on this list. To draw the house map in this report, Roper used Reynolds' map as a base and eliminated stake points, numbers, and other points not denoting features and filled in feature details from the record sheets.

Architecture

The excavated lodge at 14SA415 was a rectangular structure, oriented northwest-southeast, with the entryway extending to the southeast (Figure 2). It measured about 38 feet long and 27 feet wide. Thus, it is one of the longest Central Plains tradition houses

excavated in central Kansas. Its width, however, was a foot or so below the median value of the excavated central Kansas lodges, and the length:width ratio of 1.41 makes this lodge the narrowest relative to its length of any Smoky Hill phase lodge excavated to date (Figure 3). The entryway was about 10 feet long (assuming that it was completely excavated) and probably measured about 5 feet wide.

This lodge had the traditional, or ideal, four interior support posts. Two of these posts were each 9.6 inches in diameter; the other two were 14.4 inches in diameter. Post depths were 9.6, 10.8, 10.8, and 27.6 inches. The square formed by the interior support posts was about 8 feet on a side, which is rather small for a house of this size. As described earlier, the posts formed a diamond, oriented at about a 45° angle relative to the entryway. On the other hand, because the house was oriented northwest-southeast, the four interior posts placed at the subcardinal directions were in a rotated arrangement. One somewhat tongue-in-cheek way to describe this is to say that the interior post arrangement was characteristic; it is the house walls that were rotated.

Twenty-six posts, set in reasonably straight lines, defined the lodge walls. Wall posts ranged from 4.8 to 8.4 inches in diameter, with a median value of 4.8 inches (Table 1). Their depths ranged from 3.6 to 10.8 inches, with a median value of 7.8 inches. Post spacing varied from about 2.5 to 6 feet with one gap of about 12.5 feet on the right (northeast) wall that may represent obliterated or undetected post molds and thus be more apparent than real.

Possibly as many as seven posts marked the entryway. Their diameters ranged from 4.8 to 6.0 inches, with a median of 6.0 inches. Depths ranged from 6 to 10.8 inches, with a median value of 8.4 inches.

The collection contains over 300 g of wood charcoal, indicating that the lodge had burned. Most of the charcoal was from a cache pit (Feature 39), and a small amount was collected from the floor near the northeast wall. The material in the cache pit probably represents remains of beams or rafters that collapsed when the lodge burned. The floor material also could represent a portion of a beam or rafter or, given its provenience near a wall, could be the remnant of a wall post. Three woods identified in the assemblage are oak, cottonwood, and hackberry. Oak and cottonwood are abundant, with hackberry much less common in this collection. Given the central Kansas location, the oak probably is specifically bur oak (compare Stephens 1969). This is a strong and moisture-resistant wood that would have enabled

Table 1. Post Mold Data - 14SA415, House 1.

Map Point Number	Position	Diameter (inches)	Depth (inches)
10	wall	7.2	9.6
11	wall	8.4	10.8
12	wall	4.8	7.2
14	wall	4.8	6
15	wall	4.8	9.6
16	wall	4.8	8.4
18	wall	4.8	8.4
21	wall	8.4	10.8
22	wall	6	8.4
27	wall	6	8.4
30	wall	6	9.6
34	wall	7.2	7.2
37	wall	7.2	7.2
39	wall	4.8	3.6
44	wall	6	6
47	wall	6	7.2
50	wall	4.8	7.2
52	wall	4.8	6
53	wall	4.8	7.2
54	wall	4.8	6
57	wall	4.8	8.4
59	wall	4.8	8.4
63	wall	6	10.8
70	wall	4.8	8.4
72	wall	4.8	4.8
74	wall	4.8	6
24	interior	9.6	27.6
32	interior	9.6	9.6
40	interior	14.4	10.8
46	interior	14.4	10.8
19	exterior	4.8	6
56	entryway	4.8	6
58	entryway	6	10.8
60	entryway	6	9.6
61	entryway	6	7.2
62	entryway	6	8.4
68	entryway	4.8	9.6
69	entryway	4.8	8.4

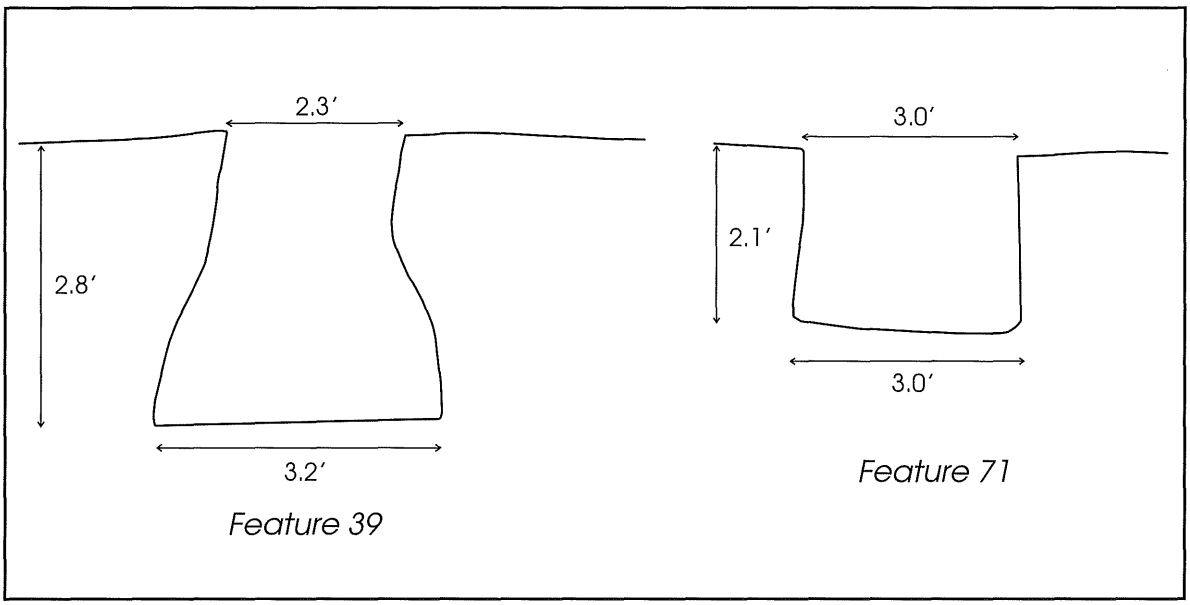

Figure 4. Cache pit profiles of Feature 39 and Feature 71 (redrawn from field sketches; not to scale).

construction of a strong and comparatively durable lodge. Cottonwood and hackberry are both common in the woods that line the larger streams of the Central Plains. Cottonwood is considerably weaker than bur oak and is not resistant to decay under exposure to moisture. It does, however, grow rather large trunks and branches. The size can help offset the weakness of the wood, and cottonwood was regularly used in lodge construction throughout the Plains. Hackberry is between oak and cottonwood in strength and has low resistance to moisture. It is a viable, but not ideal, choice for lodge construction (see Roper 2002b:28-30 on wood strength and moisture resistance and their implications for lodge construction).

Also in the collection is at least 586.8 g of architectural daub. Much of this has grass leaf impressions, at least some of which are consistent with the leaf structure of big bluestem. Big bluestem, of course, is and was abundant in the Smoky Hill River valley; moreover, it was considered by Historic-period peoples to be an excellent grass for use in lodge building because it resists decay (Gilmore 1931:69). Most of the daub was from general house fill, while one small piece with a mass of 7.7 g was from the Feature 71 cache pit.

Not strictly a structural element, but nevertheless from the house, are parts of seven mud dauber nests, ranging in mass from 10.4 to 24.8 g. Five of the seven were from general provenience in the house fill or plow zone above the house. The other two were from the eastern part of the square formed by the four interior support posts.

Features

Beyond the post molds and the floor itself, this lodge had four other features: a central hearth, two cache pits, and a basin.

Central Hearth (Feature 26)

The lodge had the usual central hearth, designated Feature 26. The hearth was exposed in plan view fairly early in the excavation period and was recognizable as an area of burned earth, ashes, and charcoal. When exposed in plan view, it was described as irregular in outline and about 24 inches in diameter. It was, however, never cross-sectioned or excavated; therefore, its depth, overall shape (presumably a circular basin), and contents are uncertain.

Cache Pits (Features 39 and 71)

Feature 39 was a trash-filled cache pit in the northwestern part of the lodge, nearly on the centerline of the house, and about halfway between the hearth and the back wall. The pit was bell-shaped (Figure 4). Its orifice diameter was about 27.6 inches; its bottom diameter was about 38.4 inches. The depth was 28.8 inches below the floor level. With these measurements, the pit volume would have been approximately 25,292 cubic inches or 11.8 bushels. The pit contained a substantial quantity of wood charcoal, some daub, one small ceramic body sherd, a

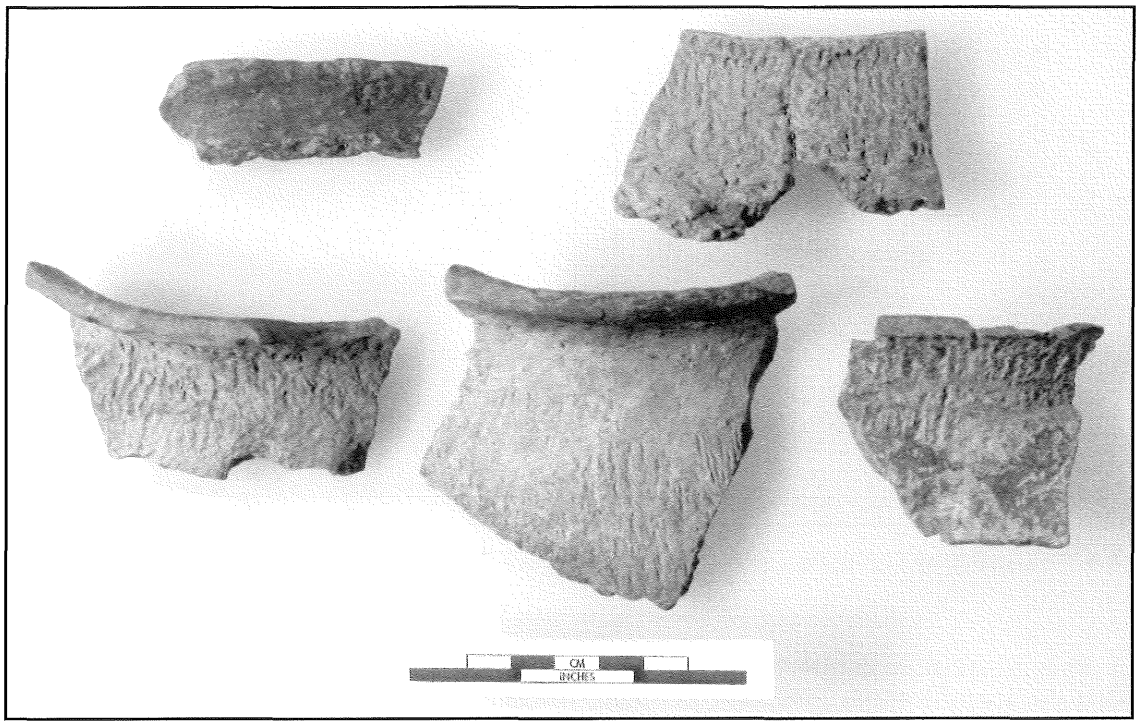

Figure 5. Riley Flaring Plain rim sherds.

shell hoe, some unmodified shells, bone fragments, a piece of chert shatter, burned sandstone, and an abrader. The low artifact density and the presence of large pieces of charcoal and other burned material in its fill suggest that the pit may have been open at the time the house burned.

Feature 71 also was a trash-filled cache pit. It was in the northeast part of the house, between the interior support posts and the northeast wall, and very close to the latter. A profile sketch in the field notes (Figure 4), along with a photograph of the excavated pit, suggests that the feature was more or less cylindrical. The diameter was 36.0 inches, and the depth was 25.2 inches. The volume, therefore, was about 25,650 cubic inches or 11.9 bushels. Pit contents included small pieces of charcoal, mussel shell, pottery, and debitage.

Basin

The alidade shot list records a "basin, pocket cache" at a location between the Feature 39 cache pit and the northwest interior support post. Apparently this basin was not given a feature number or described on a record sheet, and no plan or profile drawings were made. The alidade shot list, however, gives its diameter as 1.6 feet (19.2 inches) and its depth as 0.8 foot (9.6 inches).

Artifacts

Pottery

The 14SA415 pottery collection contains 60 rim sherds, some of which conjoin. The number of vessels represented by these rim sherds is 52. To this count must be added a nearly complete reconstructed vessel, thus bringing the total minimum number of vessels represented in the collection to 53. With one exception these vessels can be identified to the named types defined by John Hedden (1992) in his University of Kansas Master's thesis on Smoky Hill phase pottery typology. The large majority of the vessels, including 40 vessels represented by rim sherds and the reconstructed vessel, are Riley Flaring Plain. Another eleven vessels represented among the rim sherds are Riley Collared Plain. Two vessels, represented by three rim sherds, are Riley Flaring Tool-Impressed. The final vessel is represented by a single rim sherd, from which the entire exterior has spalled, leaving it unidentifiable.

The Riley Flaring Plain vessels are, by definition, characterized by direct flaring rims without decoration (Figure 5). Rim heights on 23 vessels (the others are broken such that rim height cannot be determined) range from 11.4 to 45.9 mm, with a median of 22.5 mm. Rim surfaces are generally cord roughened to

Figure 6. Restored Riley Flaring Plain pot.

Figure 7. Large Riley Collared Plain rim sherd.

the lip. Rims are smoothed and also lack decoration. A notable characteristic of this particular collection is that a small amount of clay is folded over the lip and onto the exterior on a number of rims, giving the lip a slightly thickened appearance.

Although some of the Riley Flaring Plain sherds do retain a portion of the neck and shoulder of the original vessel, these portions are too small to be able to determine such characteristics as vessel size or shape. The nearly complete reconstructed vessel (Figure 6), however, can be described in greater detail. This vessel is 215 mm high and has a maximum width at the shoulder of about 242 mm. It has an overall globular body with only the slightest hint of an elongated base and a well-rounded, rather indistinct shoulder. The body is cord roughened; however, the surface is heavily pitted, leaving the cord impressions now somewhat indistinct. The neck diameter is about 140 mm. The neck is gently curving to the 22.1-mm-high flaring rim. Cord roughening extends through the neck to the lip. Horizontal wiping lines on the rim above the neck reflect some smoothing of the exterior surface, although smoothing is incomplete. The rim is not decorated. The lip is smoothed, rounded, and undecorated. The vessel orifice diameter is 154 mm.

The Riley Collared Plain vessels (Figure 7) seem to fall into two groups. Collar heights for all rims range from 8.9 to 23.9 mm, but most are either just under 10 mm or 17–18 mm high. Collars on the low-collared rims are smooth; those on the higher collared rims are cord roughened to the lip. Lips on all vessels are smooth and undecorated.

The two Riley Flaring Tool-Impressed vessels in the collection are, of course, direct-rim vessels with decoration. Rim heights are 16.6 mm above a gently curved neck on one vessel and 25.6 mm above a rather sharply bent, nearly right-angle neck on the other vessel. Rim surfaces were cord roughened to the lip and then smoothed, albeit not quite completely, prior to the application of decoration. The decoration is difficult to see but consists of unevenly spaced, narrow and shallow incised lines paralleling the lip. The lips are smooth and undecorated.

The final vessel exhibits all the paste and temper characteristics of Riley Cord-Roughened ware. It retains a portion of a lip, making it clear that this is a rim sherd, but the exterior of the sherd has spalled away completely, making it impossible to determine if it was a direct or flaring rim and also impossible to determine if it was decorated on the exterior. The remaining portion of the lip is smooth and has no trace of decoration. Without the diagnostic traits on the exterior surface, it cannot be identified to a named type.

The collection also contains 526 body sherds, including several conjoined to rim sherds. Of this total, 525 are grit tempered and one is shell tempered. Most of the grit-tempered sherds are cord roughened. All lack decoration. The single shell-tempered sherd has a smooth exterior and no remnant of decoration.

The final ceramic artifacts are three loop handles from ceramic vessels. All appear to represent rolls of clay attached to vessel exteriors. One handle remains attached to a portion of the vessel rim and shows that the top of the handle was attached only about 5 mm below the lip. The other handles presumably occu-

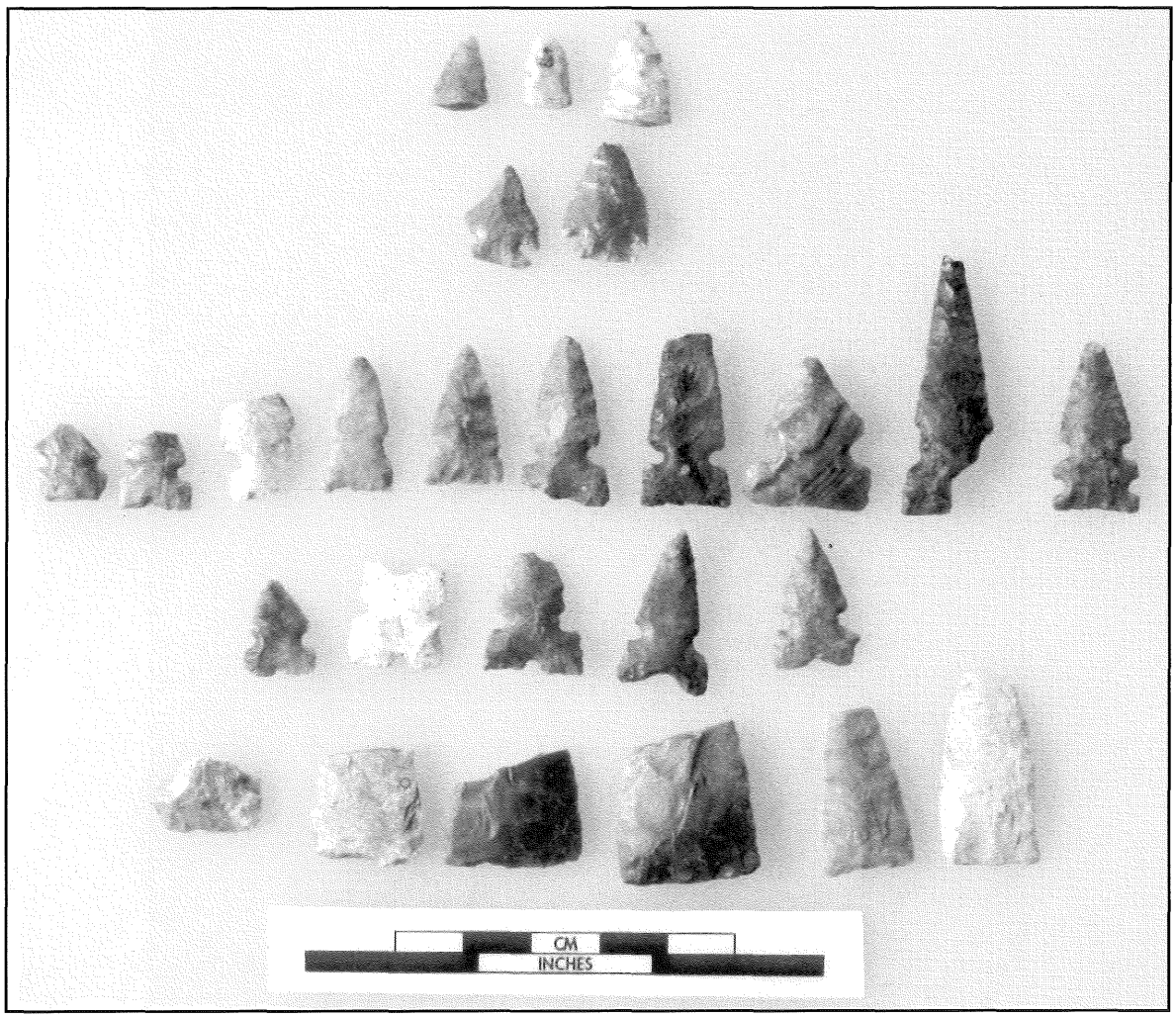

Figure 8. Projectile points.

pied similar positions. The three handles are 27.8, 31.7, and 34.0 mm high. Their surfaces are smooth and lack decoration. The handles were attached by bonding them to the vessel exteriors, not by riveting.

Chipped Stone

Projectile Points. The collection contains 26 projectile points or biface fragments reliably identified as parts of projectile points (Figure 8). Six are unnotched points, 15 are side-notched points, 2 are corner-notched points, and 3 are blade fragments the original shape of which cannot be determined. The notching configuration of the side-notched points varies. At least 7 of the 15 side-notched points have one pair of side notches and an unnotched straight base. Another has one pair of side notches and a highly concave, but not really notched, base. Three more specimens have one pair of side notches and a straight, notched base. Another two specimens have haft damage, and while it is clear that they have one pair of side notches, the base configuration cannot be determined. The final two specimens each have two pairs of side notches. One of these has a straight, unnotched base; the other has a straight, notched base. Eight complete lengths—all of them from side-notched points—range from 14.2 to 25.3 mm; 18 complete widths range from 10.6 to 20.9 mm; and thicknesses range from .6 to 4.4 mm.

Most, probably all, specimens are of Permian chert from the Flint Hills. At least five specimens probably were exposed to heat. Blade damage is evident on over half of these points. Fracture locations range from mid-blade to near the tip. Fractures are either transverse snap fractures or some form of impact damage.

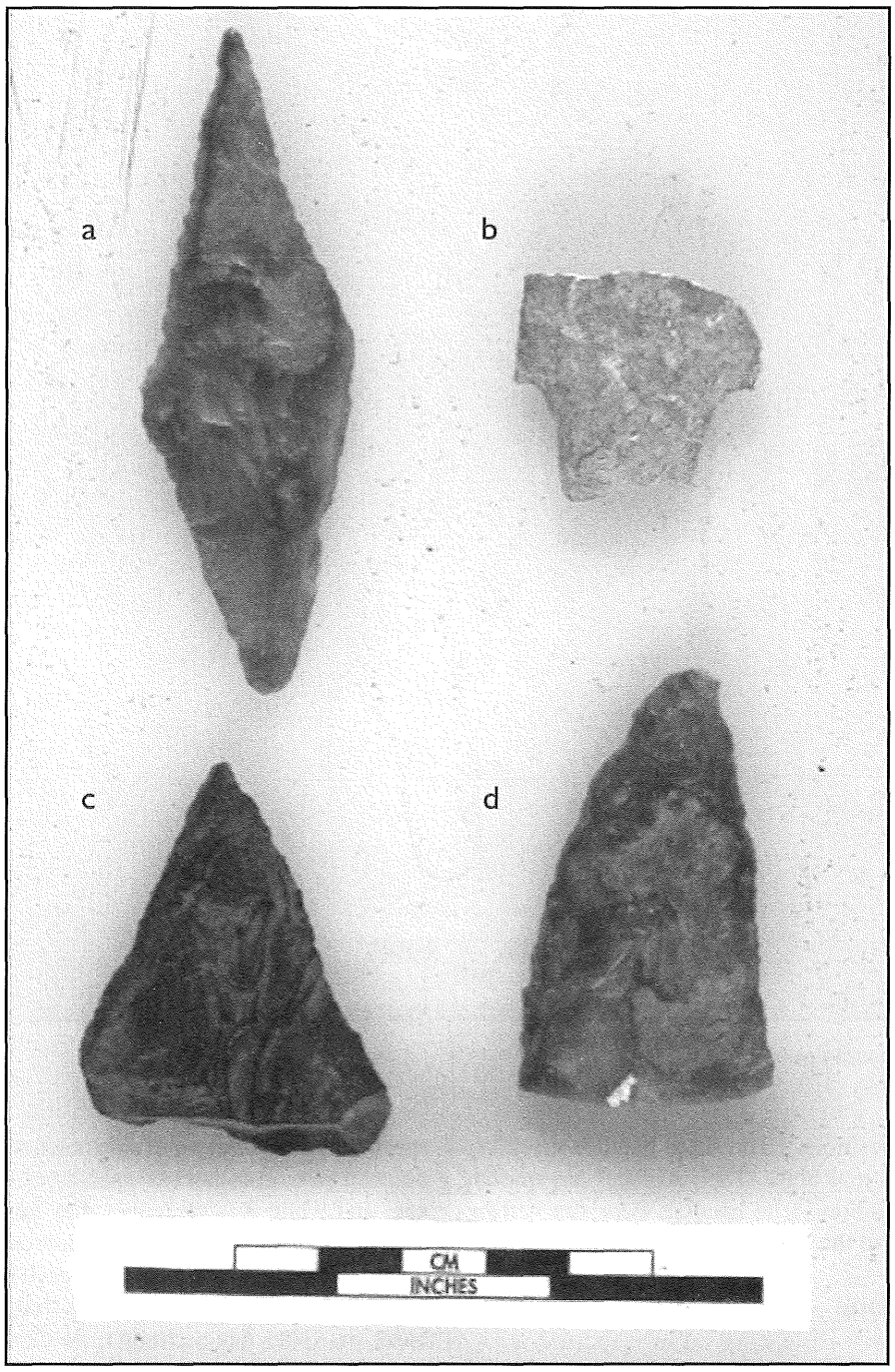

Figure 9. Bifaces/knives.

Bifaces/Knives. The group of bifaces and/or knives from this lodge is composed of 29 pieces, all but 2 of which are fragments (Figure 9). One complete specimen (Figure 9a) is a classic alternately beveled, diamond-shaped Harahey knife. It is 80.3 mm long, 25.6 mm wide, and 5.8 mm thick and is made of Permian chert. The other is an elongated oblong piece with rounded ends. It measures 92.9 mm long and 41.9 mm in maximum width. At 30.7 mm thick, this is a thick piece of Permian chert whose function is not entirely obvious.

Another 13 pieces are pointed end segments of bifacial knives (Figure 9c-d). Some of these represent a substantial portion—up to a third or even half—of a

specimen; others represent only the very ends. Most are thin and exhibit the steep retouch of a beveled knife; others are more generalized, probably more nearly leaf-shaped knives. All specimens are of Permian chert.

Another 10 pieces of Permian chert represent medial segments of bifaces. One of these is from an alternately beveled specimen; the others are not.

Three more specimens are edge segments (medial portions that also have a longitudinal fracture, thus retaining a portion of only one edge). One of these is from a beveled biface; the other two are not. All are of Permian chert.

The final biface seems to be the distal portion of the haft and proximal blade fragment of an older projectile point, one best identified as a contracting-stemmed point resembling the Gary or some other contracting-stem type (Figure 9b). This point, made of Permian chert, probably was not made by the Smoky Hill phase people who lived in the 14SA415 house, but it may have been collected and curated by them. This is not at all unprecedented. For example, many Upper Republican phase lodges and middens in the Medicine Creek valley of Nebraska have older, usually Paleoindian or Archaic, points.

Chipped Celts. Smoky Hill phase assemblages frequently feature ground-stone rather than chipped-stone celts, but 14SA415 is an exception with only one ground-stone and several chipped-stone celts. Four specimens seem to be best assigned to this category. One is a square or rectangular object 68.5 mm long, 48.4 mm wide, and 34.4 mm in maximum thickness. It has a fairly even bit end. Light step-fracturing, striations at an angle oblique to the bit edge, and rounding and polishing of the edge and high points between flake scars attest to this tool's use for fairly heavy-duty cutting or chopping tasks. The poll end is thick and blunt. How this tool may have been hafted is not apparent, although it seems to have functioned as an axe or adz and presumably was hafted in a manner consistent with this function. It is made of Permian chert.

A second celt also has an irregularly rectangular plan view but is much thinner relative to its overall size than the first specimen. This tool is 63.0 mm long, 46.3 mm wide, and 18.2 mm thick. Its bit end also is fairly regular. The bit is extensively battered and step fractured, but striations and polishing on the working end are much less apparent than on the first tool, suggesting that this specimen was used differently. The poll end is formed by the striking platform of the large cortex flake on which this tool was fashioned. Slight concavities on the lateral margins may represent provisions for hafting. The tool is made of Permian chert.

Two other specimens are more loosely placed in the celt category, although both are thick, bifacially worked pieces. One, of Permian chert, retains a cortex-covered poll end. The bit, assuming that term is properly applied here, is missing, and the two faces reflect attempts to use the fracture as a striking platform to remove flakes. Whether this represents an attempt to shape a cutting edge or recycling of the piece to serve as a core is not clear. The other piece, seemingly of a Pennsylvanian chert, is coarsely chipped to produce a bluntly pointed end. It is 71.7 mm long, 43.4 mm wide, and 28.3 mm thick. Some edge crushing, polishing, and striations are apparent on the pointed end.

End Scrapers. A total of 22 end scrapers or portions of end scrapers include 21 excavated specimens and 1 collected from the surface (Figure 10). Only 10 of the 21 specimens are complete. Another 10 are distal portions, and the other 2 appear to be proximal portions, missing the working end. Lengths of the complete specimens range from 23.1 to 52.6 mm; widths range from 17.7 to 26.0 mm. All scrapers are of Permian chert, and three of them appear to have been heated.

Retouched Flakes. A total of 18 chipped stone artifacts are best described as retouched flakes. All exhibit some degree of retouching, often continuous and steep retouch, on one or both lateral margins. One large blade-like flake is not only retouched on both lateral margins but also on the distal end. One or two of these pieces may represent broken portions of thin end scrapers. All specimens are of Permian chert.

Debitage. The collection contains 42 pieces of unmodified lithic debitage with an aggregate mass of 85.9 g (mean flake weight, therefore, is 2.05 g), including both flakes and shatter. All pieces are Permian chert. This quantity of material is too small to be useful for a systematic evaluation of Smoky Hill phase lithic technology, but it does provide a few clues. Cortex on some pieces, in addition to the presence of shatter, suggests that early stages of raw material reduction were conducted here. Several hammerstones, described below, are further evidence for this and also suggest that hard-hammer percussion was used in those reduction stages.

At least eight flakes show evidence of having been heated, one to the point of damage. As noted earlier, several tools also appear to have been heated. Together they could suggest that raw material occasionally was heat treated as part of the tool manufacturing process. Alternatively, though, this material could have been heat altered when the house burned. Unless a house is excavated in such a manner that debitage recovery

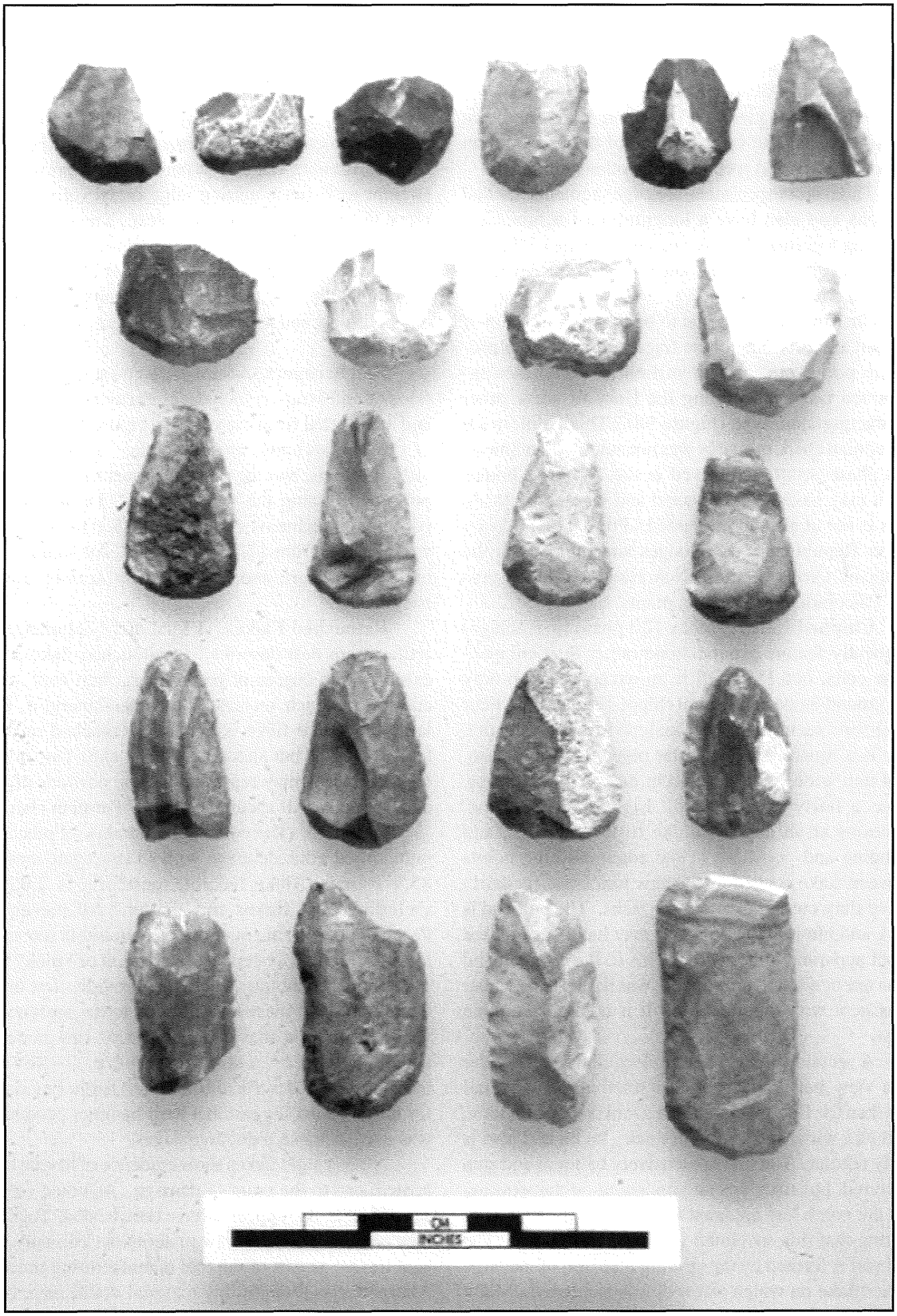

Figure 10. End scrapers.

Figure 11. Metate and mano.

is systematic and comprehensive, the place of heat treatment (if that is the case) in the technological system cannot be evaluated.

Ground Stone

Metate. A single metate was found in a position about 2 feet west of the central hearth and within the square formed by the interior support posts. Using ground-stone tool terminology proposed by Adams (2002:100), this is a basin metate, or a metate on which the grinding concavity is deliberately shaped (Figure 11). It is made of Dakota sandstone and is about 275 mm long, 210 mm wide, and 75 mm thick. It weighs about 4.5 kg. The basin is ovoid, measuring about 240 mm long, 175 mm wide, and 16 mm deep. The piece clearly was shaped by trimming the sides. It is not stable on a hard surface and only somewhat steadier when set on the ground. The base, however, was not modified to stabilize it—perhaps it was easier to modify the dirt floor of the lodge. The surface of the basin is smooth. Macroscopically, striations are visible paralleling the long axis of the basin, which is consistent with grinding in a back-and-forth motion.

Manos. Three manos are best described as flat/convex manos (Adams 2002:107). These are hand stones used with a metate. They began as tabular pieces and acquired a rectangular cross section as the faces were smoothed and reduced by use. All three 14SA415 manos were made of Dakota sandstone, and all appear to reflect shaping of the edges to form pieces that were conveniently held in the hand (Figure 11). Dimensions are 130 x 99 x 33 mm, 133 x 90 x 36 mm, and 167 x 110 x 35 mm. All are extensively worn on each face. Microscopic examination shows that individual sand grains are well worn and through use have been reduced to about the level of the interstices between the grains. In other words, these tools are fairly well worn out. Striations parallel the width axis and, coupled with the striations on the metate, indicate that grinding was accomplished with a back-and-forth rather than a rotary motion. A fourth piece probably is a portion of a mano that was broken but not worn out. The fragment measures 52.5 mm long, 80.8 mm wide, and 51.3 mm thick; in plan view it is similar in proportion to the end of the complete manos. Another piece of rock in the collection may be an additional, although less obvious, fragment of this same mano. Wear on this broken specimen is consistent with that on the other manos but is less extensive.

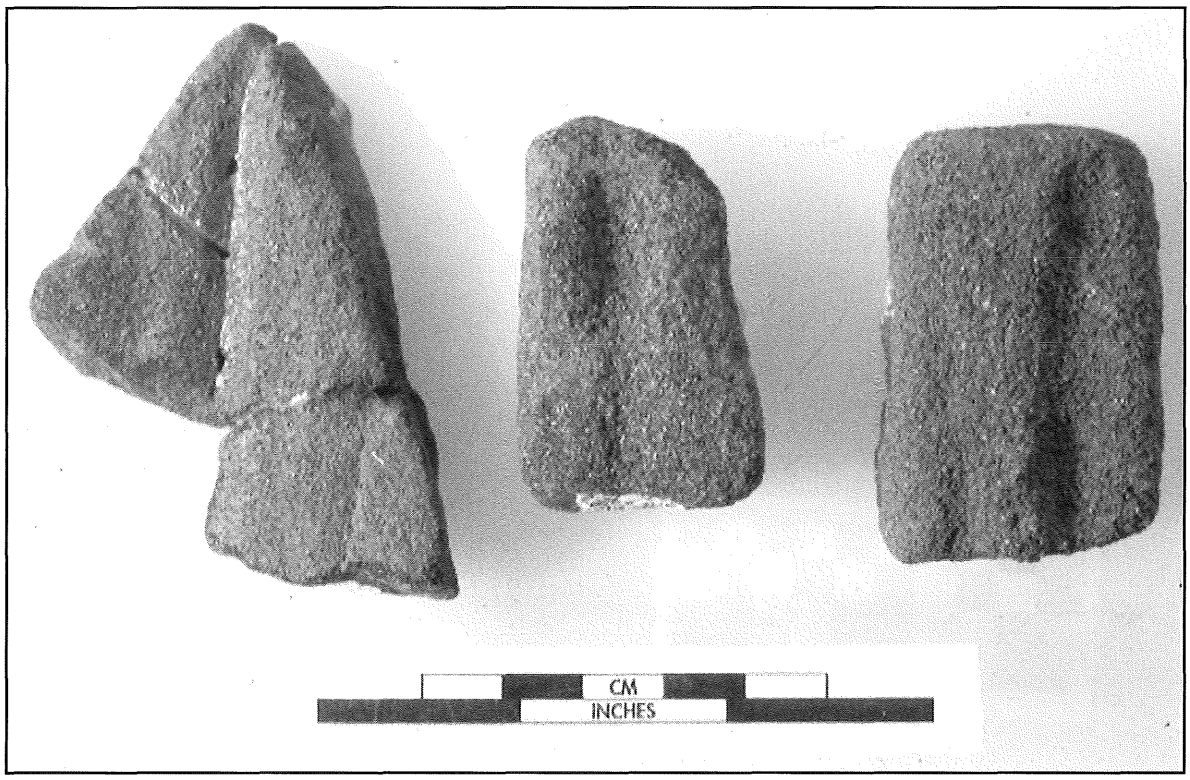

Figure 12. Abraders.

Experiments conducted with metates and manos in the Southwest showed that manos wear, and thus wear out, considerably faster than do metates. Of course, the use life depends on the amount of use, but projections for an-hour-a-day use suggest that a mano might wear out in about 2 years, while a metate might last as many as 16 years (Adams 2002; Wright 1993). The experiments were done using Dakota sandstone implements, so the results should be as applicable to central Kansas as they are to southwest Colorado.

The fragmentary specimen is about 17-20 mm thicker than the worn-out specimens, but the implied amount of reduction due to wear is consistent with those same experimental results. Two of the three worn-out specimens were found near the walls of the house, literally stuck under the beds rather than in the work area near the hearth, perhaps indicating that they had been discarded well before the house was abandoned. The third mano was collected from the surface, and its association is unknown; the fragment is from general house fill with provenience not more precisely specified.

Other Possible Grinding Stone. A final large tabular piece of sandstone is made of a finer-grained grade of material than are the metate and manos just described. This piece measures about 155 mm long, 134.5 mm wide, and 54.4 mm thick. It seems too small to be a metate, and indeed one face, while smooth to the touch, has an undulating surface that is inconsistent with the wear produced by grinding. It may be a mano, although it is a bit too large to fit comfortably in the hand. It must be remembered that, contrary to a half-century of promotional fanfare, the Smoky Hill phase women in the nearby Indian Burial Pit stood only 4 feet, 11 inches to 5 feet, 3 inches tall and, therefore, were even smaller than those of us who find this stone to be large for a mano. The function of this object is not fully clear.

Polisher. A cobble of Dakota sandstone measures 55.4 x 54.2 x 36.7 mm and has a nearly round plan view and a trapezoidal cross section. The top surface is irregular and somewhat smoothed. The bottom surface is gently curved and is very smooth, both to the touch and visually. Microscopic examination suggests the wear is of a different nature than the wear on the manos and may include some residue buildup and polishing. This piece probably was a polisher, possibly for smoothing and polishing hides.

Abraders. The 14SA415 collection contains 14 abraders, all of Dakota sandstone (Figure 12). Abraders are functionally differentiated by the shape of their grooves: U-shaped grooves are more readily associated

Figure 13. Ground stone axe/celt.

with shaft smoothing, while V-shaped grooves reflect use for sharpening bone awls or dulling the edges of chipped stone tools. This collection contains seven abraders in each of these two classes. One specimen with a U-shaped groove is a complete shaft abrader, about 155 mm long, 29.4 mm wide, and 35.2 mm thick, with the single 8.7 mm-wide, 1.5 mm-deep groove running the entire length of the tool. The other six shaft abraders are fragments. One has grooves on each of three faces; one has grooves on two faces; the other four have grooves on only one face. Grooves range from 5.9 to 15.9 mm wide and from 2.0 to 4.9 mm deep.

The other seven abraders are tabular pieces of stone with V-shaped grooves on usually one and occasionally both of the flat faces. Unlike the shaft abraders, these pieces are not really shaped, and the grooves may run at angles to the long axis of the stone as well as to each other. On one particularly notable specimen the groove is so deep that it has nearly worn through the stone.

Axe/Celt. A single ground stone axe or celt is rather small (Figure 13). It is made of fine-grained sandstone and is largely complete, although it does exhibit some fairly extensive plow damage. It is 72.6 mm long. The lateral margins diverge somewhat toward the bit end, so that the widest part of the specimen is near the bit end and measures 42.6 mm wide. The axe is 25.4 mm thick.

Hammerstones/Pecking Stones. Six cobbles in the collection probably represent hammerstones and/or pecking stones. Adams (2002:151-152) distinguished the two primarily on the basis of the amount of force with which the tools were used: pecking stones were used in lighter-duty percussion activities than were hammerstones. The 14SA415 specimens appear battered but not heavily battered, indicating that they were used for light-duty percussion, that they were not extensively used, or both. As noted earlier, the chipped stone assemblage (from not only this but also nearby sites) suggests that hard-hammer percussion was used in the local lithic technology system, so hammerstones are expected in the assemblages. Pecking stones, though, could have been used to form and resharpen manos and metates, so they, too, are expected in the assemblage.

Pipe Fragment. One fragment of limestone is a concavo-convex tabular piece that almost certainly was carved to this shape (Figure 14a). It probably represents a pipe fragment. The overall form of the pipe is not fully apparent, but it does not appear to have been an effigy pipe, nor does it appear to have been decorated in any way.

Hematite. The collection contains two pieces of hematite. One is an 8.44-g tabular pebble of hematite that has been cut and ground smooth on both faces and around the edges (Figure 14b). The other is a 4.11-g piece of soft ochre (Figure 14c), such as could come from the Dakota sandstone. It reflects some cutting and grinding, probably for pigment preparation.

Miscellaneous Rock. The collection contains 23 angular pieces of sandstone of various sizes. Three of these pieces are burned. The fragments show no evidence that they are from any formed or used ground stone tool. As already described, the 14SA415 metate and manos initially were formed by trimming slabs of sandstone. It is possible that these sandstone fragments represent some of those trimmings—the ground stone equivalent of debitage.

Other miscellaneous rock in the collection includes 25 unworked pebbles from general context throughout the house. One loess concretion is also present.

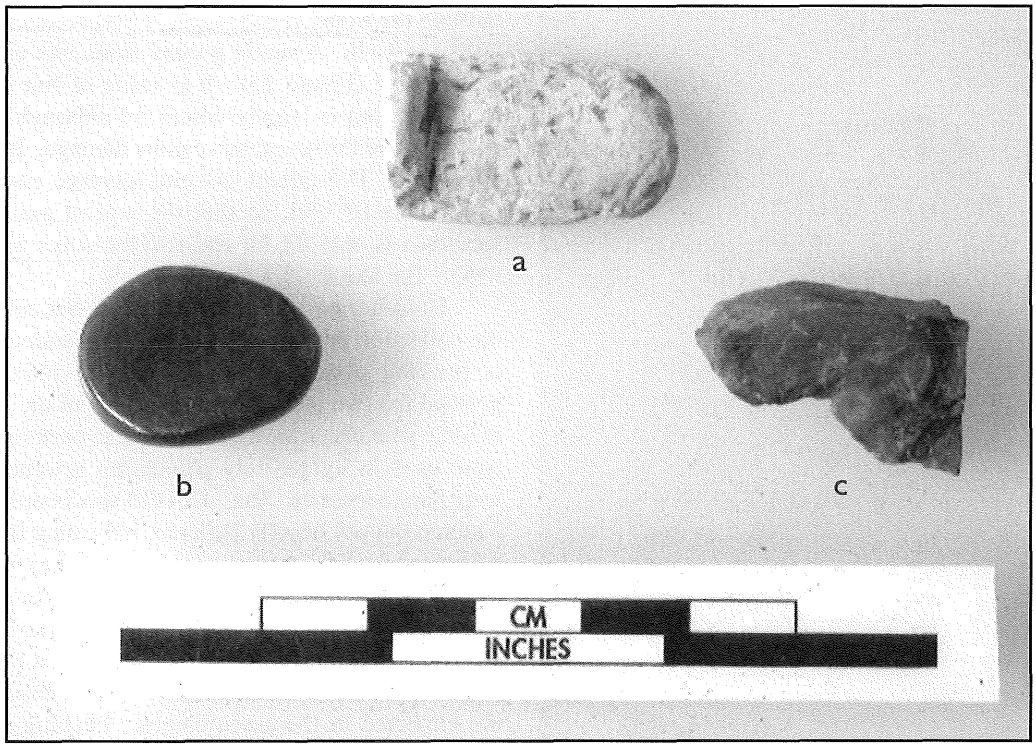

Figure 14. Miscellaneous objects: a) limestone pipe fragment, b) worked hematite, c) worked ochre.

Bone Artifacts

Awl. The collection contains a single bone awl, made on a split mammal metapodial. It is 94.8 mm long. The piece is overall complete, but it is badly rodent-gnawed.

Bead or Tube. Bone beads and/or tubes may be common in Central Plains tradition sites, but only a single specimen is part of this collection. The piece is 20.1 mm long but not quite complete. It is split and burned.

Rod or Pin. Six bone fragments are from solid bone rods or pins. All are well rounded and polished. Two of these fragments are pointed ends; the others are mid-shaft segments. Five of the six pieces are burned.

Other Worked Fragments. Another four bone fragments reflect deliberate modification. At least one may be from an awl, but in general these pieces are too fragmentary to indicate what the original form was.

Shell Artifacts

Shell hoes. The only shell artifacts in this collection are four mussel shell hoes (Figure 15). Two are large Washboard mussels, another is a large shell of another species, and the final one is a rather small piece for a shell hoe. All four specimens have holes to aid in hafting and were cut along the distal end to facilitate their use as hoes.

Subsistence Remains

Floral Remains

Floral remains, other than wood charcoal, in the collection amount to two partial kernels of corn with a cumulative mass of .23 g. Found together, they were collected from the house floor at the edge of the square formed by the interior support posts.

Animal Bone

The collection contains 48 pieces of unmodified animal bone, and some of them are complete elements. Animals represented include bison, probably deer, medium-sized mammals, small mammals, fish, turtles, and birds. Although this likely is not a comprehensive collection from this house and does not fully represent the animals used for food, it nevertheless indicates that a diverse fauna was captured and eaten. This is consistent with Central Plains tradition faunal assemblages as a whole (Bozell 1991) and some of the

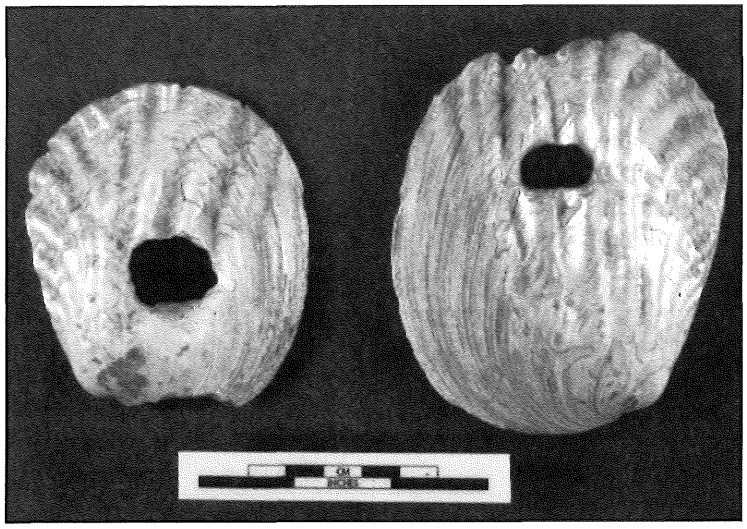

Figure 15. Shell hoes.

central Kansas Smoky Hill phase sites specifically (Brown 1981). Some small mammal bones may be recent intrusions.

Mussel Shell

Also present, and almost certainly representing subsistence remains, are 67 mussel shell valves and one umbone (hinge) of another shell. The collection represents a mix of species.

Radiocarbon Date

A sample of the wood charcoal from the portion of the collection held at the KSHS was submitted to Beta Analytic, Inc. for radiocarbon age determination. Beta reported the radiocarbon age of the sample as 710+/–60 radiocarbon years before present (laboratory number Beta-177519). When calibrated, the intercept date is A.D. 1290, with a one-standard deviation range of A.D. 1270–1300 and a two-standard deviation range of A.D. 1220–1400.

Discussion

One of the outstanding characteristics of the 14SA415 house collection is the composition of the pottery assemblage, particularly as it compares or contrasts with the pottery assemblages from other Smoky Hill phase lodges excavated in central Kansas (Table 2; assemblages shown in this table are those

Table 2. Pottery Type Representation in Selected Smoky Hill Phase Lodges.

	Site								
Type	SA415	SA414-H1*	SA414-H2*	SA403	OT308*	OT5-H8**	CY30-H1***	CY17***	PO4***
Flaring Plain	40	3	16	8	22	21	23	42	40
Flaring Tool-Decorated	2	1	1		13	7	1	2	1
Flaring Pinched		1			8	1		3	3
Collared Plain	11	2	5	7	10	8	7	9	1
Collared Tool-Decorated			2		1	1			
Collared Pinched		2			3	2	17	3	2

*data from Roper 2001

**data from Fosha 1994:34

*** data from Hedden 1992:54

Table 3. Radiocarbon Age Determinations for Selected Smoky Hill Phase Lodges.

Site Number	Lab Number	Age rcybp	Reference	Intercept date (AD)	1 sigma range	2 sigma range
14SA415	Beta-177519	710+/-60	this report	1290	1270-1300	1220-1400
14SA414-H1	Beta-178238*	820+/-40	this report	1230	1190-1260	1160-1280
14SA403	Beta-177518	890+/-60	this report	1170	1040-1220	1020-1270
14OT308	Beta-173317	730+/-60	this report	1280	1260-1300	1200-1320
						1350-1390
14OT5-H8	Beta-16480	680+/-70	Beck 1998	1298	1282-1321	1232-1409
					1340-1393	
14CY30-H1	M-113	774+/-150	Witty 1963	1277	1052-1085	989-1436
					1121-1139	
					1156-1317	
					1345-1391	
14CY17	Beta-46652	580+/-50	Ritterbush & Logan 1992	1400	1310-1354	1303-1430
					1385-1415	
14PO4	M-869	760+/-150	Johnson 1973	1280	1063-1076	994-1442
					1126-1134	
					1159-1328	
					1332-1396	

* Radiocarbon years before present.

** Accelerator Mass Spectrometry (AMS) date is on corn. All other age determines were obtained on wood charcoal using standard radiometric techniques.

near 14SA415, houses for which radiocarbon dates are available, or both). The ceramics from the 14SA415 lodge show a very low incidence of decoration. In this regard the 14SA415 collection is similar to the pottery in the Indian Burial Pit, where decoration is also very limited (Roper 2003:Chapter 8). The ceramic collection from the never-reported Winslow site (14SA403), held by the KSHS, contains 15 rim sherds representing 15 vessels, none of them decorated. Although it is difficult to know the exact composition of the ceramic assemblage from House 2 at the Kohr site (14SA414), it appears to contain at least 24 identifiable vessels, 21 of which show no decoration. The incidence of decoration is a little higher in the small collection from Kohr House 1. In both Kohr houses and in the burial pit, when a vessel is decorated, the decoration is limited to pinching, with one exception (Roper 2001:99-103). Farther afield, the pottery from five excavated houses at the Minneapolis site (14OT5) varies. At least one house is dominated by undecorated vessels, but other houses show a much higher incidence—in one case even a majority—of decorated vessels (Beck 1998:299; see also Fosha 1994:34). Similarly, only a little more than half of the ceramic vessels from Markley site (14OT308) House 1 are undecorated; the rest are decorated (Roper 2001:122-127). In the Minneapolis site case in particular, decoration also may be more complex motifs than on the few decorated 14SA415 and 14SA414 vessels, something that Hedden's typology (like Central Plains tradition pottery typologies in general) does not capture.

How this variation is interpreted is an important matter. The usual interpretation is that ceramic variation measures time. Several researchers have seriated Smoky Hill phase pottery collections, thinking that they were putting the seriated units (usually assemblages from individual houses) in chronological order. It is always possible to order units on the basis of their increasing similarity or dissimilarity, which is what a seriation does. However, unless the ordering criteria (pottery types) have been independently shown to be good time markers, it cannot be assumed that the derived ordering is indeed chronological. This is pertinent in the Smoky Hill phase case because in not one instance have external means been used to verify that the seriated order is actually a chronological order. In part this is because the means to validate the ordering as an actual chronological order are not available. Smoky Hill phase (and Central Plains

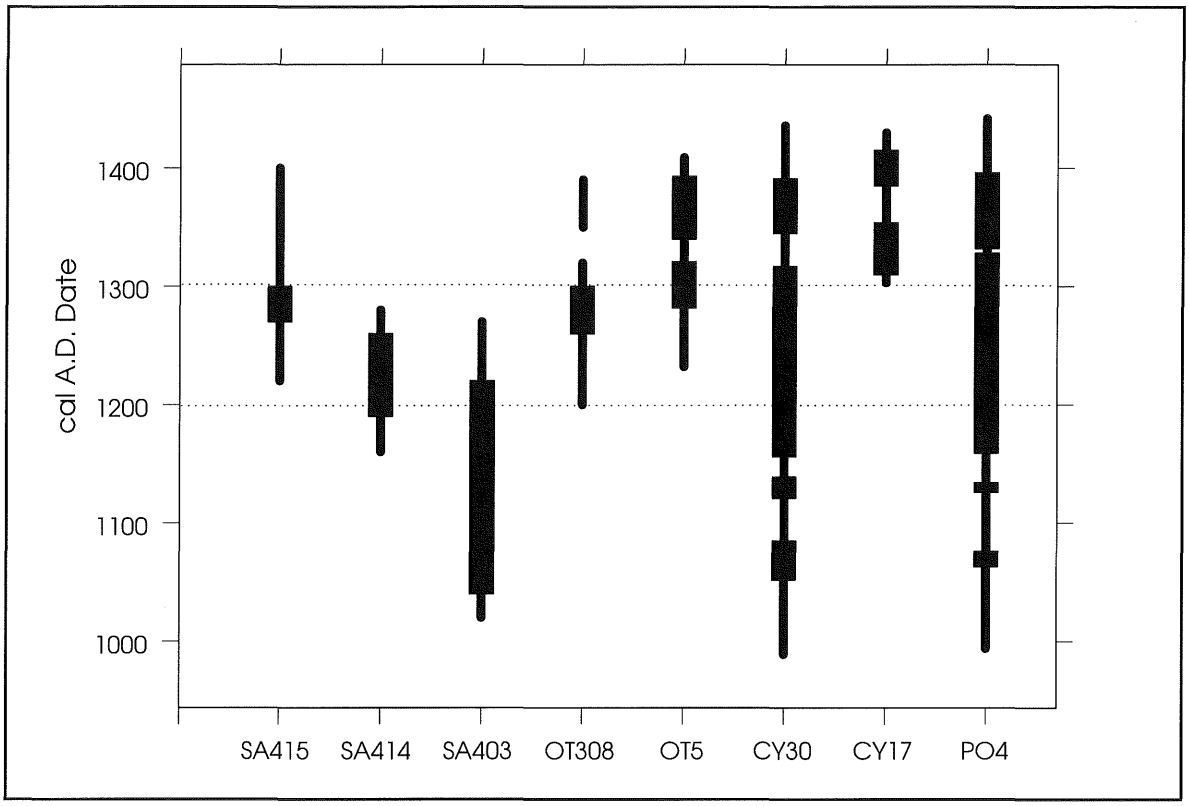

Figure 16. Calibrated radiocarbon dates from central Kansas lodges.

tradition in general) sites are not stratified, so using the composition of superposed assemblages to determine the nature of ceramic changes over time is not possible. Most seriated assemblages also have lacked radiometric control that could help support or refute the temporal interpretation of ceramic variability. Neither of these problems can be pinned on any particular investigator, but this exoneration does not alleviate the problem.

Newly obtained radiocarbon age determinations, in combination with several previously obtained assays and the pottery assemblage data in Table 2, now allow us to begin to address the question. Table 3 lists recently obtained radiocarbon age determinations for 14SA415, 14SA403, House 1 at 14SA414, and 14OT308, along with previously obtained age determinations for 14OT5, 14CY30, 14CY17, and 14PO4. Calibrated dates and calibration statistics are shown. Plotting the calibrated date ranges enhances the message derived from these data (Figure 16).

The large standard deviations for several of the previously obtained age determinations mean that the date ranges span so much time as to be not really useful. However, while the 14SA414 House 1 date is a little earlier than the others and the 14SA403 date is still earlier, it is obvious that all dates overlap in the late twelfth and the thirteenth centuries. Two more detailed comparisons are particularly dramatic. Contrast 14SA415, where 50 of 52 identifiable vessels (96.2 percent) are undecorated, with 14OT308, where only 32 of 57 identifiable vessels (56.1 percent) are undecorated. Then note that the radiocarbon dates are nearly identical (and statistically <u>are</u> identical). The second comparison is between 14SA415 with its 96.2 percent undecorated vessels and 14SA403, where all 15 identifiable vessels (100 percent) lack decoration, yet the dates for these two sites do differ. While some risk is involved in using only single age determinations for each site (house), this chronometric data set does not support an interpretation of temporal change as the reason for variation among the Smoky Hill phase ceramic assemblages.

An alternative is that the variation is spatially ordered. This does have some support from the data shown in Table 2, as well as other data compiled in the cited sources. It is further supported by examination of the pottery in Reed's surface collections from other sites in the Saline and Ottawa counties area, although the composition of those collections is not yet quantified. All these data together seem to reflect

Table 4. Vessel Counts in Central Kansas Lodges.

Site/Lodge Number	Vessel Count	Site/Lodge Number	Vessel Count
OT5 - H23	150	PO4	47
CY1	79	OT5 - H1	39
CY17	59	RP5	28
OT308	57	CY3	26
CY2	55	SA414 - H2	24
SA415	53	CY4	21
OT5 - H8	53	OT2	19
OT5 - H2	53	SA403	15
OT5 - H3	51	CY6	15
CY30	48	SA414 - H1	12
Data from Beck 1998; Fosha 1994; Hedden 1992; Roper 2001; and this report.			

a low incidence of decoration on vessels from the sites in the Smoky Hill River–Saline River confluence area and the lower Smoky Hill River valley, a higher incidence of decoration in at least some of the Solomon River valley sites collections, and a higher proportion of tool decoration among the decorated vessels from the Solomon River valley sites. In other words, pottery styles vary more across drainages than they do within and along a specific valley. Quantification of other assemblages, particularly if it can be done using an analysis protocol that considers decoration in greater detail than does the simple identification of rim sherds to established types, should be undertaken to verify and further explore the nature of the spatial variation in Central Plains tradition pottery. The results of a current study, using neutron activation analysis, of selected pottery samples from sites strung along several river valleys in central and western Kansas and the adjacent part of Nebraska also should help clarify the situation (Hoard 2002).

Certainly, however, a group of sites in the Smoky Hill River–Saline River confluence area and within a few miles of the burial pit that share a ceramic commonality can be identified. Because that commonality happens to be expressed as a dearth of decoration and simple decoration when decoration does appear, a more detailed analysis of ceramic decoration will not substantially modify that observation. This may constitute only one of a number of what might be called, for want of a better term, microstyle zones in the river valleys of the Central Plains and may mark the extent of a Middle Ceramic period community in the present-day Salina area. The burial pit was the community's cemetery; the houses at 14SA414, 14SA415, 14SA403, and others, represent the dwellings of community members. Potentially, the range of radiocarbon dates is an indicator that this community persisted minimally for much of the thirteenth century.

The spatial extent of this Smoky Hill River valley community is unknown, but the essence of a community is frequent and regular interaction among its members (Yaeger and Canuto 2000), and spatial proximity is a prerequisite for those interactions. It is notable that studies of Mississippian chiefdoms in the Southeast suggest that those polities were no more than about 25 miles across and often were much smaller (Hally 1993). The Smoky Hill phase communities were not chiefdoms; however, Mississippian polity size is in part a product of human biology and available transportation technology. Those factors did not differ between Mississippian and Smoky Hill phase groups. Therefore, it is interesting to contemplate the possibility that this late prehistoric community in the Smoky Hill River valley may have been far smaller than modern Saline County and possibly not much larger than the greater Salina–New Cambria area, although it probably was not sharply bounded. Further survey and detailed analysis of existing collections will enhance our definition of the community, its spatial extent, and the nature of its boundaries.

It should not, however, be assumed that the community's population can be estimated from the number of houses within the limits of this microstyle zone. Assuming that the duration of the community is measured in decades, the number of houses should represent several cycles of house construction, followed by replacement of worn-out houses. How long a lodge might have lasted is an interesting question and one that would have implications for estimating a local population by using house data.

Ethnographic evidence for lodge use life is limited to Weltfish's (1965:86) comment that the average

life of a lodge was 12 years and the maximum life was 15 years, and Wilson's (1934:372) report that a lodge lasted 7 to 10 years. These figures are for the large, heavy-timbered historic lodges. Use lives of Central Plains tradition lodges may have been different. On the one hand, these earlier lodges are smaller, and they seem less sturdy and less durable; on the other hand, one of the big problems with a lodge is its enormous weight and the loads the structural members must bear—weights and loads that must have been less in the smaller earlier lodges. A maximum figure of seven years or so is often assumed. It is interesting, therefore, to note that three worn-out manos were found in the 14SA415 lodge. This could be coincidental, or, if a two-year use life is reasonable for a mano, the count could be indicative of how long the house was used and how many manos were worn out during that time.

Dwelling use life sometimes has been estimated from the number of discarded ceramic vessels found in the remains (Varien and Mills 1997). Because the rate of ceramic vessel breakage and discard for a Central Plains tradition house is not yet understood, there is no way to calculate lodge use life in years using ceramic assemblage data. However, the compilation of vessel counts from 20 central Kansas houses in Table 4 shows remarkable consistency. While the full range is 12 to 150 vessels, the number of vessels in 9 of the 20 houses falls in the narrow range of 47 to 59, with the assemblages from only 2 of the other 11 houses exceeding this number. All houses in this compilation were excavated using comparable excavation techniques and recovery criteria, suggesting that the comparison is a fair one. With the modest assumption that the discard rate was reasonably uniform across houses, the authors tentatively suggest that the similarity in total accumulation could result from using houses for similar amounts of time and that this amount of time might be the maximum use life of a lodge. Further validating this possibility and translating that use life to a number of years will require other forms of evidence.

The 14SA415 lodge remains show no indication of an attempt to repair the structure. Apparently it was replaced instead. The broken or worn-out condition of many of the objects in the house fill supports an interpretation that the lodge was purposely abandoned prior to burning. In other words, it did not burn by accidental ignition while still occupied. If so and if the community persisted beyond the abandonment of this particular lodge—and it probably did—then the burning may have been an intentional means of disposing of the lodge. In a study of lodges in the Medicine Creek valley of southwest Nebraska, Roper (2002a) found that the incidence of lodge burning was so high (over 80 percent) as to suggest that lodges were deliberately and routinely burned at or after abandonment. Other studies cited in that paper, as well as others compiled since, show the similarly high incidence of house burning in Southeastern Mississippian and European Neolithic societies. The authors of many of those studies have similarly argued for intentional, even ritual, burning of worn-out and abandoned houses.

Conclusion

Writing the site report for yet another Central Plains tradition lodge excavation sometimes seems redundant. As this paper shows, however, that is far from the case. Reporting the 14SA415 lodge excavation, even 33 years later, shows that new information is always forthcoming from studying these collections. To be sure, not a lot is learned about the basic form of the assemblage or the shapes and sizes of projectile points—those matters were settled decades ago. However, there is an opportunity to report details that some earlier investigators did not evaluate; this would include lithic raw materials and some of the technological information for ground stone tools as discussed in this paper.

The study of the 14SA415 excavation and collection also adds significant information concerning variability in house form within a single community and takes an important step toward understanding ceramic variation and the sources of that variation in Middle Ceramic period central Kansas. Still, many questions remain, so analysis of unstudied collections will continue to be productive for the foreseeable future.

Acknowledgments. The Kansas State Historical Society funded the radiocarbon age determinations for 14SA415 and several other Saline County sites. Our thanks to Bob Hoard for his willingness to commit the money to this purpose. We also appreciate the efforts of the KSHS photographers who took the artifact photographs for this report (except Figure 12), and Manhattan graphics artist Cindy LaBarge who drafted the excavation and house floor plan.

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NOTES

Sandstone Celts?

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The Kansas Anthropologist 24:69-71

This paper proposes a function for Dakota sandstone celts and presents the reasoning by which the author arrived at the proposed function.

Since the early 1960s I have been locating, recording, and cataloguing surface material from prehistoric sites in Saline and the adjacent counties in central Kansas. All of the prehistoric time periods from Paleoindian to the Late Ceramic are represented here; however, as expected, the Middle Ceramic-age Smoky Hill is the culture that left the greatest number of sites. Consequently, most of the sites that I have recorded are affiliated with the Smoky Hill culture.

One type of artifact from these sites has caught my attention: a ground stone celt made of the local Dakota sandstone, which outcrops in central Kansas. Early inhabitants of the area used this common stone for many tools such as shaft smoothers, manos, metates, and other tools where abrading was the primary function of the tool.

A celt (pronounced "selt") is an ungrooved polished or flaked stone axe or hatchet. I have found chipped celts made of chert in various locations and one ground stone celt made of granite on a Saline River site northeast of Salina. However, I am of the opinion that the sandstone celts have a characteristic that may indicate a special function for which they were used.

This paper refers to 10 celts from 7 different Saline and Ottawa county sites. A quick search of material from Smoky Hill sites in Kansas curated by the Archeology Office of the Kansas State Historical Society did not locate any of these tools from counties other than Saline and Ottawa. This, however, is not intended to imply that they do not occur in other locations in Kansas; I expect that they do.

Sandstone, being a sedimentary rock, is naturally laid down in layers of accumulating sand. This layering is apparent on some of the tools in this study, but not all of them. The sand particles are quite fine on some specimens and coarse on others. Some specimens are very hard, while others permit sand particles to be rubbed off rather easily with the fingers. Some of the specimens (catalogue numbers S61, S234, and S180) have surface areas that are spalling off, following the contours of the tools (Figures 1 and 2). This spalling occurs in various thicknesses on the same tool. One might compare it to an orange with several layers of peeling.

In my opinion this artifact type was used as a skinning tool to help removed hide from a large animal, such as deer or bison, after the hide was opened up with a sharp stone knife. Generally, prehistoric hunters would not have wanted to cut holes in animal skins. A dull celt could have been used as a wedge to separate the hide from the membrane over the meat, much more easily than using the fingers and without cutting the hide like a stone knife might. If these tools were indeed used in the skinning process, the stone would have become covered with animal body fat. The oil would have penetrated the sandstone to various depths, resulting in the spalling of layers that followed the contours of the tools.

In Table 1, A, B, and C are measurements at the following points: B is taken at the midpoint of the tool; A is taken midway between the blade (distal) end of the tool and Measurement B; C is taken midway between the point (proximal) end of the tool and Measurement B (Figure 3). The first measurement listed is the maximum width at each location, and the second measurement is the maximum thickness at each location. The girth is the maximum circumference at any location on the tool. The colors were determined by the use of the Munsell color chart.

One additional specimen, which was considered

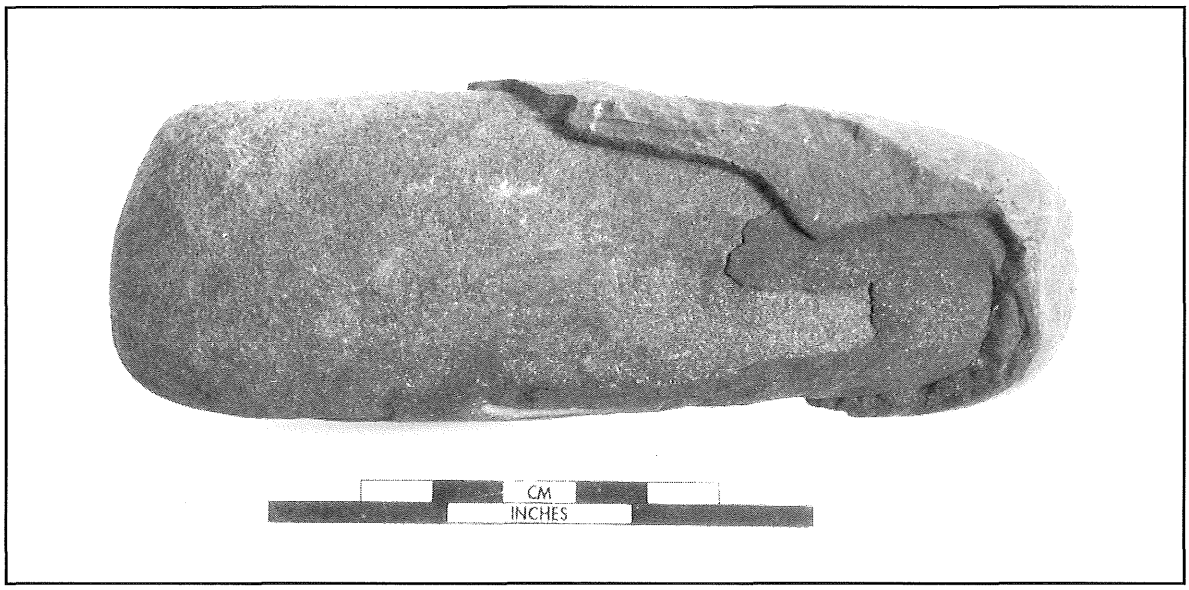

Figure 1. This specimen shows distinct spalling of the surface area of the tool.

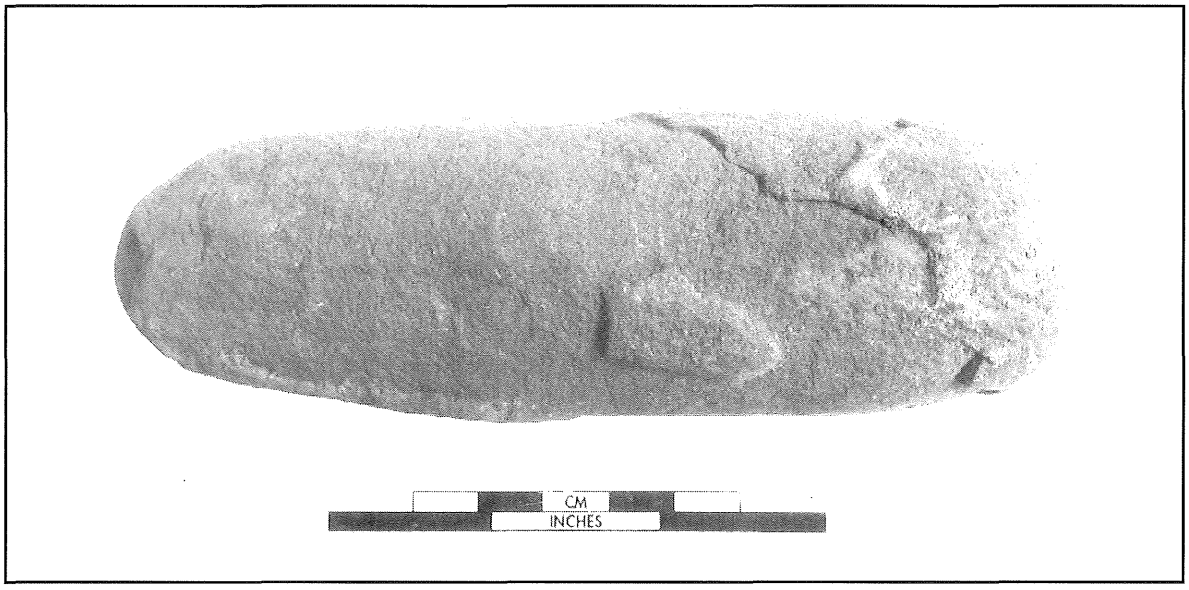

Figure 2. Another specimen shows evidence of spalling.

for inclusion in this study but eventually disqualified because it is not made of Dakota sandstone, is interesting and deserves some comment. This celt, found on Chapman Creek east of Chapman, Kansas, appears to have been made from a gray chert cobble. Quite a lot of the original limestone cortex is still present on the tool. Most chert celts are shaped completely by percussion flaking. However, this piece has been ground to the point that most of the percussion flaking scars have been removed. It is of similar size and shape as those studied here and very well may have served the same function as those made of sandstone. The piece is unique, and I appreciated the opportunity to examine it.

"Conclusion" seems a rather final word for this paper, so perhaps something like "where do we go from here?" would be more appropriate. The next logical step would be some experimental archeology. A sandstone celt would not be difficult to shape. (I would be happy to donate some sandstone from my pasture.)

Table 1. Measurements of Specimens in Study Set.

Catalogue Number	Site Number	Maximum Girth in mm	Maximum Length in mm	A in mm	B in mm	C in mm	Weight in g	Texture	Color
S133	14SA408	13.00	89.80	40.92 17.45	40.45 29.41	33.18 27.00	126.1	fine, soft	7.5YR5/4
S234	14SA409	14.50	137.26	45.92 28.11	48.47 36.05	44.44 31.02	560.1	fine, soft	7.5YR4/2
S180	14SA409	15.00	151.85	43.00 20.17	47.18 32.75	46.23 33.40	353.7	fine, soft	7.5YR3/2
S61	14SA410	17.75	120.42	59.67 27.03	69.08 35.91	57.36 34.77	336.2	fine, soft	7.5YR4/3
S132	14SA408	13.25	128.11	47.57 25.72	42.66 29.52	33.54 25.98	238.8	fine, soft	7.5YR3/2
S19	14SA412	14.00	107.99	46.69 31.03	45.26 30.30	37.67 32.14	264.3	coarse, hard	5YR4/2
1007	14SA420	14.75	incomplete	52.28 327.22	missing missing	missing missing	196.7	fine, hard	10YR4/1
7442.10	14SA420	16.00	187.40	51.95 30.79	51.49 34.40	45.12 35.38	510.0	fine, soft	7.5YR4/4
2752	14OT5 House 23	16.25	145.03	59.95 37.65	60.71 41.80	71.53 40.26	527.0	fine, hard	7.5YR5/2
468	14OT5	11.0	73.67	44.89 22.01	39.82 24.43	37.12 23.15	112.5	fine	2.5YR4/1

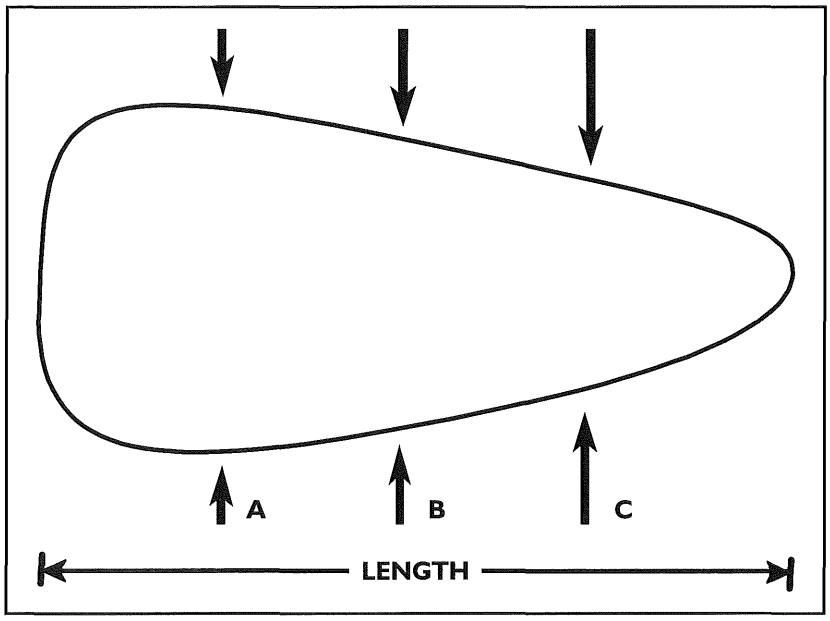

Figure 3. This illustration shows the points at which measurements were taken for the comparisons in Table 1.

Then in the fall the tool could be used on a deer to see if it has any merit as a skinning wedge. I could enjoy working on such a project, but to my regret my health will not permit those activities now—maybe later. In addition, I request that collectors and curators review their artifact holdings to look for sandstone celts, especially those that are spalling off in the profile of the tool, as in Figures 1 and 2. If this paper generates enough response, I will compile and publish the results in a future issue of *The Kansas Anthropologist*. In case someone wants to follow up on some of these recommendations, I can be reached at 3825 E. Stimmel Rd., Salina, Kansas 67401; (785) 823-8303.

Acknowledgments. I would like to thank those who gave their generous help on this project: Nick Fent, geologist from Salina; Virginia Wulfkuhle, our patient editor; Chris Garst, KSHS lab supervisor; and Margie Reed, typist and consultant. I take full credit for any mistakes.

NOTES

Use of Geophysical and Remote Sensing Technology to Locate and Delineate Unmarked Graves in Kansas' Clay-Rich Soils

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The Kansas Anthropologist 24:73-85

Maplewood Memorial Lawn Cemetery in Emporia, Kansas, contains a tract of land documented as containing approximately 705 unmarked graves. In 1870 this area was set aside as "Potter's Field" and used for burials of the underprivileged and minorities. It was sold to the Memorial Lawn Cemetery Association in 1928, and no more burials were recorded. In 2002-2003 research was carried out to determine the feasibility of locating unmarked graves in Potter's Field using geophysical technology, which has proved to be complex in Kansas' clay-rich soils. Positive identification of burials with an electromagnetic conductivity meter and kite aerial photography provided conclusive evidence that geophysical technology can be successful in finding not only unmarked graves but also archeological sites.

We are born, we live, and we die. Humans have faced this inevitable circumstance since their emergence hundreds of thousands of years ago. Our ancestors made friends, belonged to families, lived purposeful lives, and were laid to rest by those they left behind. When people stroll through cemeteries, they might notice depressions, mounds, and vegetative differences. Without the knowledge of graves, they might write off these topographic and vegetative features as drainage patterns from runoff or simply disregard them altogether. Are these surface features actually indicative of graves?

The modern world of population growth, urban development, and environmental protection has led to an increased need for land space and has forced people to realize the necessity of preserving the history that lies just below the land surface. It has become increasingly important for archeologists to determine the locations of these now-buried historic sites through time-efficient and cost-effective methods.

A particular type of historic site, unmarked cemeteries and graves, poses a serious problem for land development. All over the world unmarked cemeteries are stumbled upon when construction crews begin excavations for buildings, roads, highways, and bridges. For example, in Lisbon, Spain, archeologists recently recovered a 4,000-year-old tomb, revealed by excavations for a new road (News 24 2003). In northeast England graves dating between the seventh and ninth centuries were discovered beneath a school playground when the site was inspected prior to building expansion (BBC News 2003). In Phoenix, Arizona, archeologists recently repatriated human remains to the descendants of the ancient Hohokam culture that were removed from what was to be a subdivision of 760 houses (AZ Central 2003). Finally—and on a more localized level—an unmarked cemetery in Emporia, Kansas, held back plans for future land development (Maplewood Memorial Lawn Cemetery, personal communication 2003).

The dilemma of unmarked cemeteries and graves is not limited to urban development but includes requests for plot space in older established cemeteries. According to officials at Maplewood Memorial Lawn Cemetery (personal communication 2002), probing to delineate an unmarked grave is allowed. However, a grave that is old enough may have deteriorated to the point of non-detection; furthermore, probing is often

a time-consuming procedure if no plot map is available for reference. Thus, requests of individuals or families for plot space may be refused.

Geophysical Methods For Locating Graves

These unfortunate circumstances underline the need for rapid and accurate methods for locating and delineating unmarked gravesites. There are a number of geophysical methods that have been applied with varying success to non-invasive exploration (Conyers and Goodman 1997), including electromagnetic induction and ground-penetrating radar. The success of a given geophysical instrument depends on different factors. For example, ground-penetrating radar may be successful at locating subsurface features in sandy soils but unsuccessful in clay-rich soils that attenuate radar energy. However, the identification of subsurface features in clay-rich soils may be successful with electromagnetic (EM) conductivity.

The field of forensic science may be especially helpful in testing the effectiveness of both geophysical methods by providing the geophysical responses of known buried features under known soil parameters for comparison to buried features with unknown conditions. For example, in the author's study original burial documentation indicated that some burials were made in wooden boxes, while other records suggested that no boxes were used. Forensic studies may help to determine if decreased apparent conductivity values are indicative of intact, non-deteriorated graves or if depressions on the surface point to collapsed graves. Studies also may assist in the identification and dating of graves where no wooden boxes were present.

On a geophysical research site on the Highlands Ranch Law Enforcement Training Facility in Douglas County, Colorado, pig carcasses are buried to simulate human remains in different soil conditions at different stages of decay. It was determined (France et al. 1992) that EM conductivity surveys were more useful than magnetometry, a survey sensitive to iron-bearing materials for locating such burials. On the research site surveys, ground conductivity decreased over graves. This decrease in conductivity was attributed to the increased porosity of the backfill materials. This geophysical method does not sense the actual buried material, but rather the disturbances of the soil. The decreased bulk density of the soil and concurrent increase in air-filled porosity allows the instrument to be used to detect the grave shaft.

Another potential method for delineating unmarked graves is ground-penetrating radar (GPR). GPR uses radar pulses that reflect off buried features to provide three-dimensional images. On the Japanese island of Kyushu, GPR revealed intact burials dating to A.D. 300-700. Although surface soils in this area of Japan are well developed, the underlying parent material is comprised of prehistoric ash (Conyers and Goodman 1997). According to Bevan (1983), GPR is limited to a shallow profiling depth in some soils, in particular those with high clay content; therefore, GPR was highly successful for locating burials in Kyushu's clay-poor matrix.

Methods for locating and delineating unmarked cemeteries and graves are not limited to geophysical technology; remote sensing devises can also be used. While satellite imagery and forms of small-format aerial photography provide moderate resolution of the earth's surface and may be successful at locating unmarked cemeteries and graves, kite aerial photography is a low-cost and time-efficient method for acquiring high-resolution photographs to accomplish the same goals. For example, Dr. James and Susan Aber have demonstrated their expertise at taking aerial photographs with kites. Compared to hot air balloons, helicopters, or airplanes, equipment costs and operating expenses for kite aerial photography are low. Kite aerial photography involves rapid field setup and can be deployed quickly to document ephemeral events, such as floods, fires, etc. Furthermore, where the targets for investigation are small surface features, such as vegetative patterns from unmarked graves, kite aerial photography has a pixel resolution of 5-10 cm (Aber et al. 2002). Had kite aerial photography been employed for the 760-unit housing project in Phoenix (AZ Central 2003), it might have proved a very effective, time-efficient method for delineating areas of ancient Hohokam remains prior to the construction project.

Kansas' Impediments

Geophysical and remote sensing methods have demonstrated their success for identifying unmarked graves and cemeteries. However, these methods may not be successful for every research site due to certain impediments. It is essential to understand the limitations of each geophysical instrument in any given setting. Geophysical surveying is not 100 percent successful, for almost any landscape has a unique set of physical characteristics that may adversely affect the successful use of the technique. For example, Lyon County soils are characteristic of most other soils in Kansas: silt loam, silty clay loam, silty clay, and clay

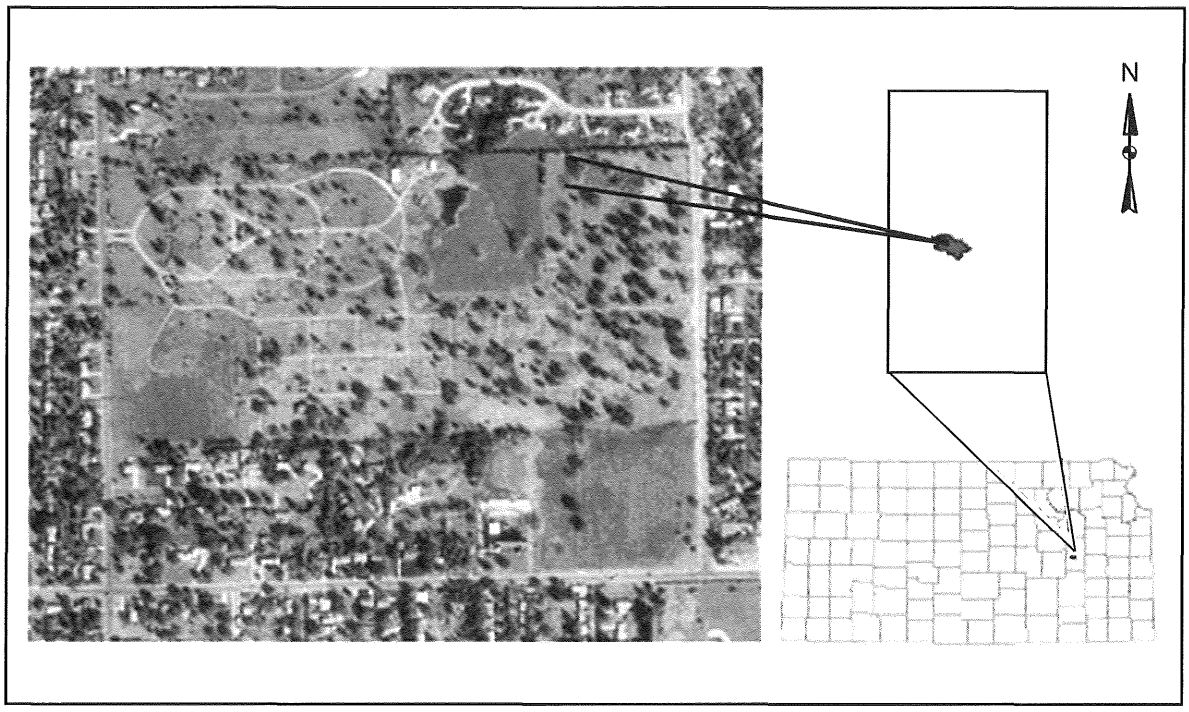


Figure 1. Research site. Potter's Field, Maplewood Memorial Lawn Cemetery, Emporia, Lyon County, Kansas.

loam (Neill 1981). With the exception of the sand dune regions, Kansas' thick and clay-rich soils impede radar transmission, limiting the success of GPR (Conyers and Goodman 1997). Thus, to successfully locate and delineate unmarked graves or archeological sites in Lyon County and other places with similar soils, the use of another geophysical tool must be considered.

Another impediment to the successful use of geophysical and remote sensing techniques in eastern Kansas involves the seasonality of precipitation. Lyon County's average precipitation in April is 2.83 inches, while in August the average precipitation is 3.55 inches (Neill 1981). Although August's precipitation is not significantly higher than April's, higher temperatures facilitate higher rates of evaporation. If precipitation levels during the summer months are lower than average, the soil conditions in August likely will be significantly dry, adversely affecting vegetative ground cover and soil conditions, which determine the success GPR and EM ground conductivity meters.

Soil properties of Lyon County and Kansas climatic conditions were considered by the author when selecting an EM conductivity meter and kite aerial photography to delineate unmarked burials in Emporia. Based on similar research related to the delineation of unmarked graves (Bevan 1993; France et al. 1992) and evaluation of equipment limitations (Cook and Walker 1992; Ellwood 1990; McNeill 1980), the author hypothesized that these methods should be successful for identifying unmarked graves.

Site Selection and Description

The author selected Maplewood Memorial Lawn Cemetery in Emporia to conduct research on locating and delineating unmarked graves with non-invasive geophysical and remote sensing technology. The study area is located in the southwest corner of Section 4, Township 19 South, Range 11 East in Lyon County of east-central Kansas (Figure 1).

The research site occupies an area of approximately 2,000 m^2 on the northeast side of the cemetery. This cemetery was an ideal research site for three primary reasons. First, the cemetery includes a tract of land with approximately 705 unmarked graves. From 1871 to 1928, underprivileged individuals and minorities of the community were segregated in a part of Maplewood Cemetery referred to as Potter's Field. Second, Potter's Field includes a small number of known, marked graves, contemporaneous with the unmarked graves. Anomalous features associated with

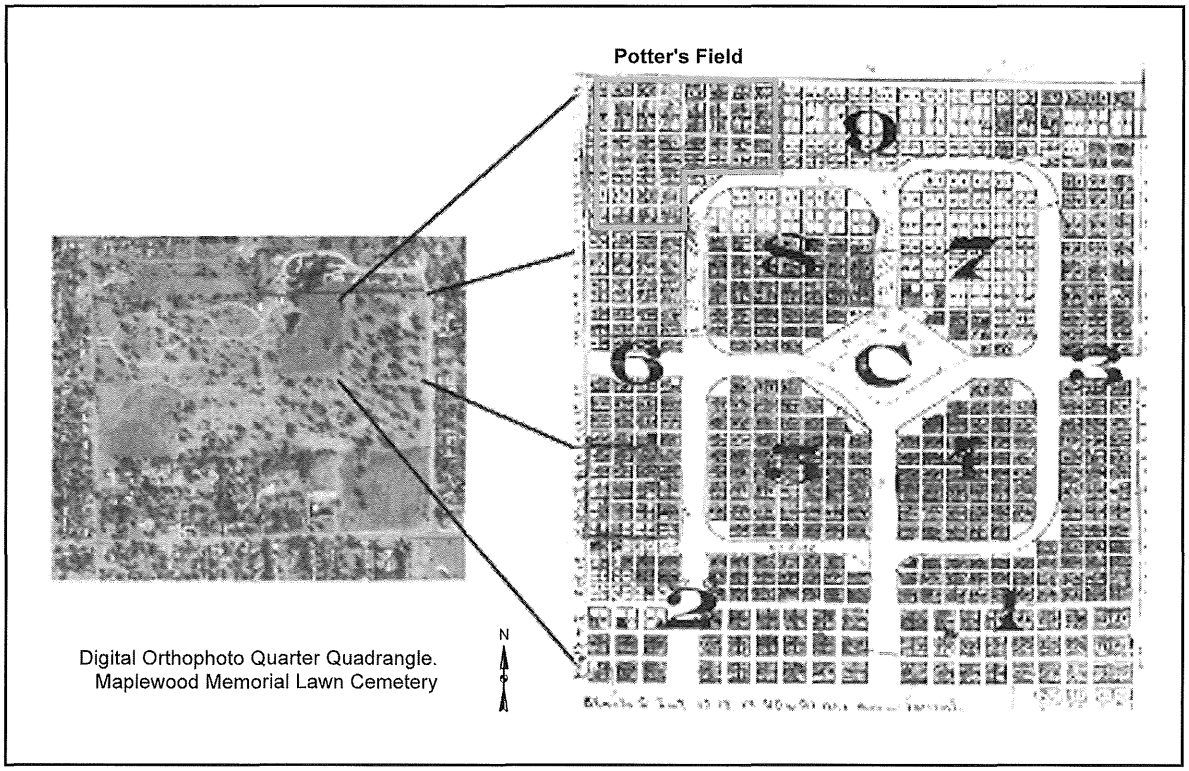


Figure 2. Potter's Field plot map, Memorial Lawn Cemeteries Association.

known graves served as comparisons to the many unmarked grave features. Third, the cooperation of cemetery officials and the study site's location near Emporia State University's resources made research very convenient.

From 1871 to 1928, most Potter's Field burials were marked with numbered wooden stakes. Only 26 burials had headstones (Maplewood Memorial Lawn Cemetery, personal communication 2002). Although historical documentation has yet to be found, it is believed that a prairie fire swept through Potter's Field in the 1920s. The fire burned the wooden stakes, leaving over 700 graves unmarked. Maplewood Cemetery was sold to Memorial Lawn Cemeteries Association in 1928, the year that Potter's Field burials ceased. Given the absence of markers for so many burials, it is likely that the new owners decided against additional burials in this tract. For over 80 years now this vicinity has remained vacant, allowing time for vegetative growth, surface erosion, and grave deterioration. Although a plot map does exist (Figure 2), Potter's Field burial records do not indicate burials according to that map. Thus, locating and delineating graves in this area is challenging.

On the other hand, Euroamerican burial traditions are remarkably predictable. Since the arrival of Christian Europeans in the sixteenth century, burial customs dictate that interments be placed in rows of east-west orientation, head to the west, feet to the east, the body placed face up. "For as the lightning comes from the east and flashes to the west, so will the coming of the Son of Man" (Matthew 24:27 New International Version). Thus, for the Christian believer in the resurrection of the dead, placing the body facing east will allow the deceased to see the second coming of Jesus. This east-west pattern, evident in virtually every cemetery throughout America, enabled the research strategy of this investigation to remain consistent.

Records Research

Original Potter's Field burial records also contributed to the geophysical and remote sensing investigation. Archived at the Lyon County Historical Society in Emporia, burial records include the deceased name, interment number and date interred in Potter's Field, and stake number. Some records provide miscellaneous information, such as burial material, disinterment date, age, and ethnicity. Burial records and obituaries have been valuable resources in understanding Potter's Field history and have provided useful information on factors that directly

influence anomalous readings. Take the example of Laurent Blanc.

> Laurent Blanc, a shoemaker, being short of work at his trade, went to work on the M.K. and T. railroad on Tuesday, and yesterday, just after dinner, complained of feeling unwell, sat down and soon after laid down on the track. Near five o'clock, his fellow workmen saw a train approaching and called to him to move. As he did not get up, one of them went up to him and found him insensible. They put him on a car and brought him to town, but he died before he reached home. He resided on south Commercial Street, just below the Commercial Hotel. He was a Frenchman, came to this country about eighteen months ago. We understand that he has something near two thousand dollars, but he lived very penuriously, and his wife wanted his body nailed up in a rough box and taken to the cemetery with just as little expense as possible. He had not been accustomed to out-door work and his death was caused, no doubt, by the intense heat (*Emporia Ledger* 1878).

Laurent Blanc's burial is marked with one of the 26 headstones found in Potter's Field. Based on the information provided in the obituary, it is likely his wife was able to afford a marker. The reason most individuals of Potter's Field did not have headstones was because their families were unable to afford them. The obituary documented that Mr. Blanc was "nailed up in a rough box," perhaps indicating the burial method of other graves in Potter's Field. Burial method is considered while analyzing geophysical data in evaluating the likelihood of a non-deteriorated, still-intact grave.

While some obituaries and burial records reveal potential burial methods and historical information, other records reveal information on disinterments. Disinterments are essential to note while evaluating geophysical and remote sensing data because, like graves themselves, they cause soil disturbances. Without proper identification, a disinterment could be mistaken for an unmarked grave.

Potter's Field burial records and obituaries are definite signs of the times. Diseases, such as typhoid fever, Bright's disease (nephritis), scarlet fever, and smallpox, afflicted these individuals. Without vaccinations and medical technology, chances of survival were reduced, especially for the very young and very old. This is evidenced through burial records, indicating 309 children, nearly half of the Potter's Field graves.

Noting the numerous child graves becomes important in analyzing geophysical data. First, children's graves are likely to be smaller than adult graves. Therefore, looking for small, discrete anomalous features becomes a significant factor in the attempt to locate and delineate unmarked graves. Second, some burial records reference a child's burial at the foot of an adult. Other records document that some children shared stake numbers, possibly signifying one burial on top of another or sharing an adult-size plot. Such documentation led the author to consider the possibility of anomalous features appearing shallower than adult graves or two small anomalies in the same plot space. Finally, if a child's grave is near complete deterioration, it may be more difficult to identify than an adult grave. The author speculated that adult-size graves, therefore, might be more discernable than the significant number of child graves.

Methods

Although no burial was referenced to the plot map, the author cross-referenced headstones with 16 stake numbers to determine the possible burial pattern. Unfortunately, there did not seem to be any pattern to the stake sequence; thus, the burial pattern could not be determined in this way. Could these graves still be identified? What factors would influence the feasibility of detecting these features?

To properly address these questions, it was essential to evaluate the soil properties where the unmarked graves remained and determine which instrument would be most successful in locating and delineating soil disturbances and features in the given soil condition. The author had previously determined that Lyon County soils are predominantly fine textured with a subsoil clay content of 40-60 percent (Neill 1981). Therefore, GPR was not the optimal choice of instrumentation to conduct a geophysical survey in Potter's Field. Instead, the author chose to use an electromagnetic ground conductivity meter (EM-38), designed by Geonics Limited, Mississauga, Canada.

The EM-38, operating off a 9-volt battery, measures a depth-weighted average of the earth's electrical conductivity. The weighted average is termed apparent conductivity (Cook and Walker 1992). The EM-38 contains a coil at both ends of the instrument. The transmitter coil at one end of the EM-38 generates an electrical current that creates an electromagnetic

Figure 3. The author demonstrates the Geonics Limited electromagnetic ground conductivity meter in the vertical dipole position.

field. The electromagnetic field causes electrical current to flow, inducing a secondary electromagnetic field, sensed by the receiver coil at the other end of the EM-38 (Bevan 1983). The electromagnetic field at the receiver end indicates the weighted average of conductivity of the soil in the 1-meter vicinity of the instrument—hence, apparent conductivity.

The meter's depth response is a function of its fixed 1-m intercoil spacing and dipole orientation. In a vertical dipole configuration (Figure 3), electrical current transmission is dominantly through the upper 1.5 m of the soil. In this position the instrument is more sensitive to the deeper, more or less conductive material. When the instrument is laid on its side in a horizontal dipole position, the meter is sensitive to near-surface features up to approximately 75 cm below the surface (McNeill 1980). Because different soils and buried features have varying capacities to conduct electrical current, changes in the conductivity across the surface can indicate the presence of a buried feature (Conyers and Goodman 1997). Many soil parameters, as well as buried and external features, affect ground conductivity. Ground conductivity is primarily a function of the soil's moisture content, clay content, porosity, and salinity (Ellwood 1990).

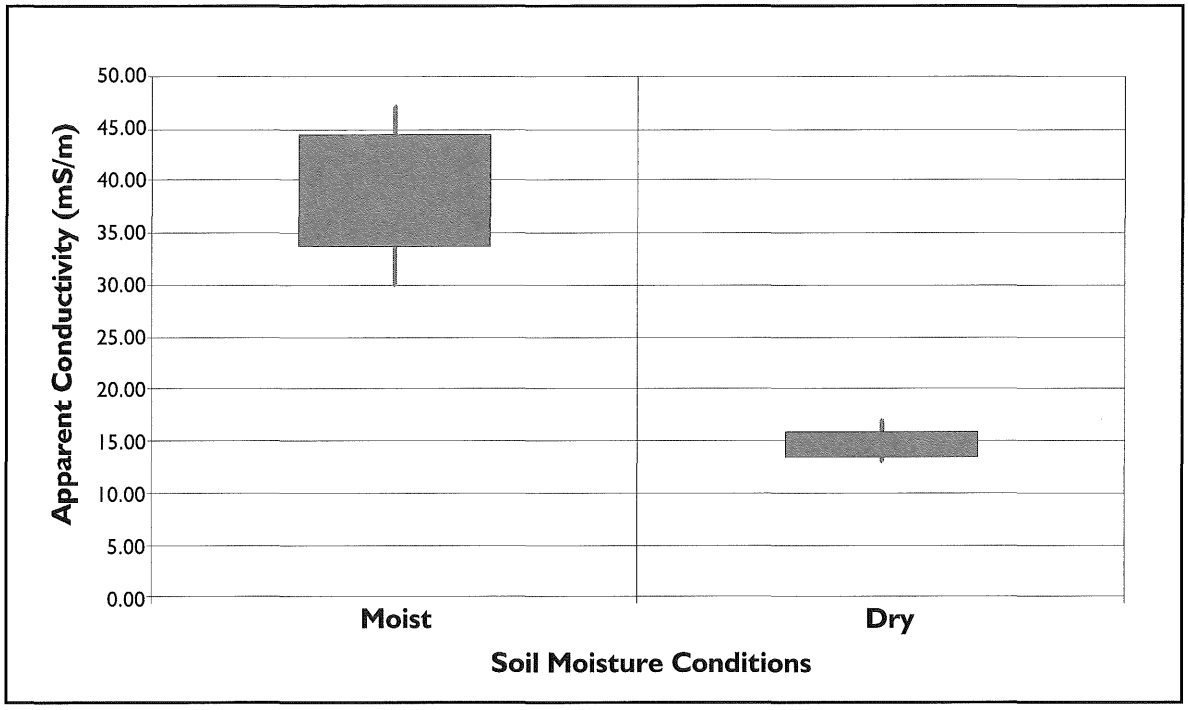
It is important to note that Potter's Field contains marked variations in soil conditions due to the presence of backfill material in the graves. Soil compaction influences porosity and infiltration; the number, size, and shape of pores affects moisture content. The author hypothesized that significant rainfall or severe drought conditions would adversely affect conductivity measurements. Because moisture easily conducts electricity, saturated soils would be highly conductive in both disturbed and undisturbed conditions, perhaps masking the identifying features. Conversely, porous soils decrease apparent conductivity. Under significant drought conditions, conductive response might be too low for any anomalous features to be apparent. Moderate soil conditions were presumed to be optimal surveying conditions for successful identification of anomalous features.

In addition to moisture and porosity, conductivity is also a function of clay content. Smith-Rose (1934) concluded that clays have the highest conductivities, whereas sandy or gritty soils are appreciably less. If clay content were the exclusive factor affecting conductivity, Lyon County soils would exhibit high conductivities due to their high clay content (Neill 1981). However, at any given location relatively few soil parameters that affect ground conductivity are dominant (Bevan 1983).

Other functions of conductivity, such as soil salinity, were evaluated. Seasonal variations in precipitation levels and evaporation rates affect soil salinity and the exchange of free ions (Ellwood 1990). Thus, it became important to monitor precipitation levels and compare apparent conductivity values. The influences of spatial variability of such soil properties as moisture content, clay content, porosity, and salinity—and their variability with depth—must be taken into consideration to accurately interpret conductivity results.

Conductivity measurements are not solely influenced by soil properties. Rather, features buried within soil, such as metal, also affect conductivity values. Although wooden boxes historically were used for burials, steel vaults were used as early as 1917

Table 1. Approximate relative conductivity of soil conditions, soil properties, and different earth materials.



(Maplewood Memorial Lawn Cemetery, personal communication 2003). Table 1 demonstrates relative conductivity of different earth materials. Metal is shown as having high conductivity. Therefore, if steel vaults were present in Potter's Field, the metal would generate conductivity anomalies significantly different than the surrounding clay matrix. On the other hand, air voids, representing intact graves, are poor conductors of electric current. If a non-deteriorated, intact, unmarked grave remained in Potter's Field, one would expect an indication of low conductivity in comparison to the surrounding undisturbed soil. How different materials affect conductivity was considered in interpreting the EM-38 data.

Disinterment

Ground truthing is not a frequent option after conducting a geophysical survey in a cemetery unless circumstances, such as a disinterment, permit otherwise. In March 2002 an opportunity arose to test the results and observations of the EM-38 on a disinterment in another section of Maplewood Memorial Lawn Cemetery. The disinterment, which was requested by family members, was of a 1946 burial that reportedly had been made in a pine box. Given the age of the burial, cemetery staff questioned the integrity of the box. Thus, a limited EM conductivity survey was conducted to determine if an air void could be detected, possibly suggesting an intact grave.

The surveyed transect included three graves: the first dated to 1946, the second was the 1946 burial to be disinterred, and the third dated to 1971. Grave #1, contemporaneous with the one to be disinterred, exhibited vertical and horizontal dipole conductivity values lower than undisturbed soil. These values appeared to demonstrate the decrease of apparent conductivity due to backfill material and increased porosity. No values indicated an air void that might suggest the presence of a still intact grave. Grave #2 exhibited higher conductivity values in the vertical dipole and significantly lower conductivity values in the horizontal dipole position. Unlike Grave #1, the higher conductivity values suggested the presence of a good conductor, possibly metal. The significantly lower conductivity values appeared to indicate an air void, suggesting the possibility of an intact grave. Grave #3 contained a cement vault. Apparent conductivity values were very similar to that of Grave #2. Given the relative certainty that the 1971 grave was intact and contained an air void, the author felt assured that Grave #2 also was still intact. Grave #2 was carefully outlined with surveying flags for disinterment.

The disinterment confirmed an intact grave, as indicated by significantly low conductivity values in the horizontal dipole position. These anomalous readings appeared in the horizontal dipole mode because the air void was present in the upper 75 cm of the soil. The pine box was lined with a very thin sheet of metal, which likely produced the high conductivity values in the vertical dipole position. The metal lining had restrained the collapse of the almost completely deteriorated wood box.

Assuming that this burial was made in a similar manner to those of Potter's Field, which are 20-75 years older than the disinterred grave, the author presumed Potter's Field burials would be in similar (still intact) or in worse (completely deteriorated) condition. Because Potter's Field burials are considerably older than the disinterred grave, intact burials might not be numerous. Therefore, apparent conductivity readings associated with the intact disinterment might not be found in abundance in Potter's Field. Furthermore, due to potential greater deteriorated conditions, apparent conductivity readings might demonstrate less significant values than shown with the intact grave. Overall, the author was assured that the instrument was successful in identifying soil disturbances and, at lease in this case, delineating a grave.

Electromagnetic Conductivity Field Session I

The author began an EM conductivity study on April 13, 2002, surveying in grid patterns in areas that included some known, marked graves. The changes in apparent conductivity at known graves served as comparisons to those unknown, and this aided in many of the identifications. The survey was conducted in .5-m alternating transects, which eliminated the possibility of missing a narrow burial shaft, even that of a child's grave.

The extensive survey was conducted April 13-28, 2002, during which time precipitation levels rose, temperature fluctuated, and vegetative cover increased. Average conductivity response was compared to precipitation patterns to demonstrate how precipitation levels affect apparent conductivity and to demonstrate how dipole position (vertical versus horizontal) may determine the success of locating and delineating unmarked graves under certain weather conditions. It became evident that apparent conductivity is more sensitive to precipitation in the horizontal (upper 75 cm) dipole position, reinforcing the fact that conductivity is a function of moisture. In addition to moisture sensitivity, the horizontal dipole recorded many anomalies unrelated to unmarked graves, such as a coin, dead tree roots, and a piece of scrap metal. The author did not rule out that shallowly buried graves might be delineated in the horizontal dipole position. However, without the ability to ground truth each anomalous feature, the method did not appear to be as error proof as surveying in the vertical dipole mode.

Kite Aerial Photography

Vegetative cover increased during the two-week field session in Potter's Field. To determine if vegetative tonal differences were apparent, possibly denoting unmarked graves, kite aerial photographs of the study site were acquired. On May 3, 2002, Dr. James and Susan Aber of Emporia State University assisted with the first session of kite aerial photography. Aerial photographs were taken at approximately 1:00 p.m. to reduce shadows of trees or other standing features that might be mistaken for unmarked graves. For acquiring photographs of Potter's Field, a digital camera (although other imaging devices can be used) was placed in a single camera rig attached to kite line. A large kite was utilized as the lifting device to place the camera rig 50-150 m above the surface (Aber et al. 2002). To avoid turbulence and sudden movements caused by the kite, the camera rig was attached approximately 15-30 m below the kite. Using binoculars to view the lens direction and a radio control to capture the photographs, 66 digital photographs were taken of Potter's Field and various other parts of the cemetery.

Figure 4 illustrates a georeferenced digital photograph of Potter's Field on May 3, 2002. Georeferencing converts an aerial photograph with non-real-world coordinates to a real-world coordinate system using Geographic Information System (GIS) tools. Utilizing ArcMap computer software from Environmental Systems Research Institute, Inc. (ESRI), kite aerial photographs, and acquired Global Positioning System (GPS) units of the headstones, Potter's Field was referenced to the Universal Transverse Mercator (UTM) coordinate system. GPS headstone readings were used as control points to warp the aerial photograph from one coordinate space to another. Each control point (headstone) was referenced to its known location on the aerial photograph. The relationship between the control points and the aerial photograph was then determined, producing a photograph referenced to the UTM coordinate system.

Kite aerial photography was successful in

representing vegetative tonal differences, as indicated in Figure 5. As the aerial photograph was referenced to the UTM coordinate system, vegetative tonal differences could be accurately located in Potter's Field and suggested the possibility of additional unmarked graves along the west boundary of Potter's Field. The results of kite aerial photography underlined the need to conduct another EM conductivity survey over the vegetative tonal differences shown as an east-west rowed pattern.

Electromagnetic Conductivity Field Session II

On September 22, 2002, after a long, dry summer, the author returned to measure apparent conductivity under different soil conditions. As found with the EM conductivity survey conducted in April, climate fluctuations, such as increased amounts of precipitation, influenced conductivity measurements. The author theorized that the dry conditions would yield lower apparent conductivity values than the

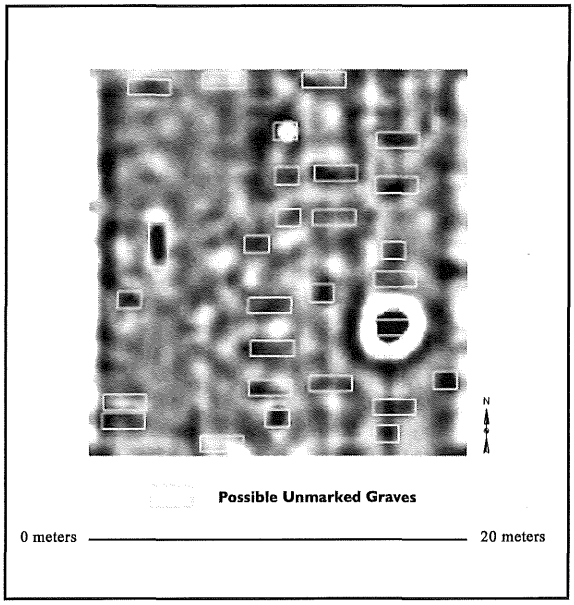


Figure 4. Vertical dipole EM conductivity survey of Potter's Field.

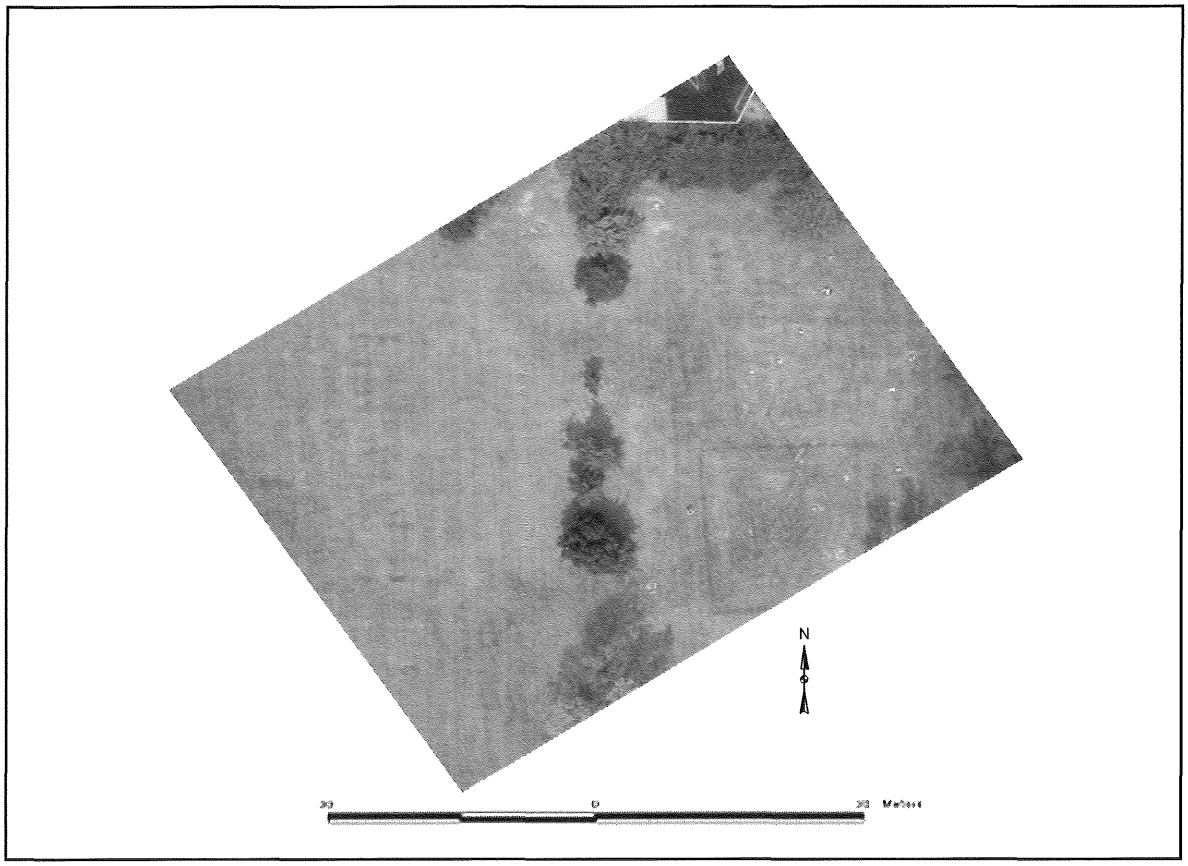
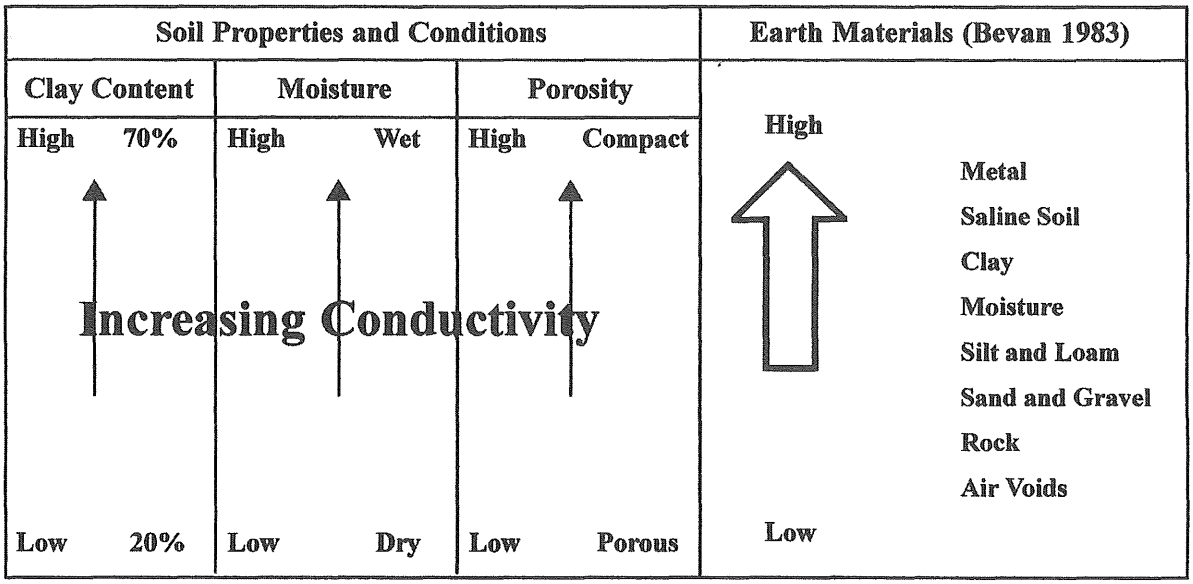


Figure 5. Georeferenced kite aerial photograph of Potter's Field. Vegetative tonal differences are apparent. © Dr. J. Aber and E. Wilson-Agin, Emporia State University.

Table 2. Apparent Conductivity Comparison to Soil Moisture Conditions of April and September 2002.



previous field session in April when soil conditions were moist.

Relatively few anomalous readings in the vertical and horizontal dipole modes, were apparent in the September survey. In fact, all apparent conductivity values were significantly low, confirming the expected reduction in apparent conductivity in comparison to April. Furthermore, *all* horizontal dipole values were significantly lower than vertical dipole values, indicating that surface material was consistently less conductive than material at greater depths. If the vegetative tonal differences apparent in kite aerial photographs *did* represent actual unmarked graves, backfill material should be less conductive as the EM-38 revealed. However, values in the vertical and the horizontal dipole modes indicated very slight anomalies, if any. Given the lower-than-average precipitation levels and the overall low apparent conductivity values, the author determined that the soil was too dry for the EM-38 to be successful at delineating the unmarked graves.

Table 2 demonstrates the comparison of apparent conductivity values of the April 2002 and September 2002 surveys, when soil moisture conditions were moist and dry, respectively. Extreme highs and negative apparent conductivity values were removed to eliminate biased results. It is evident that there is a significant reduction in apparent conductivity in September in comparison to April, in addition to a significant reduction in apparent conductivity range. Dry soil conditions reduce apparent conductivity overall, minimizing the feasibility of detecting anomalous EM readings. Moderate soil conditions, as in April, increase conductivity, as well as strengthening the likelihood of identifying anomalous EM readings and delineating unmarked graves.

Electromagnetic Conductivity Field Session III

In March 2003 another EM conductivity survey was conducted in Potter's Field. Moderate soil conditions were present, as the ground was moist but not saturated. Again, the main objective of this survey was to determine if unmarked graves were identifiable under moist soil conditions in the area surveyed in September. Anomalies, represented as vegetative differences in kite aerial photographs, were identified with the EM-38 during the March survey, confirming that moderate soil conditions are a definite factor in the success of locating and delineating unmarked graves. Furthermore, it verified that extreme dry conditions, like those during the September 2002 EM conductivity survey, were not optimal for identifying anomalous features.

Results

The three EM conductivity surveys indicated that apparent conductivity is greatly influenced by porosity and moisture content. The extent to which the pores are filled with water will strongly increase apparent conductivity. In the disturbed soil of a grave shaft, porosity increased in comparison to the surrounding

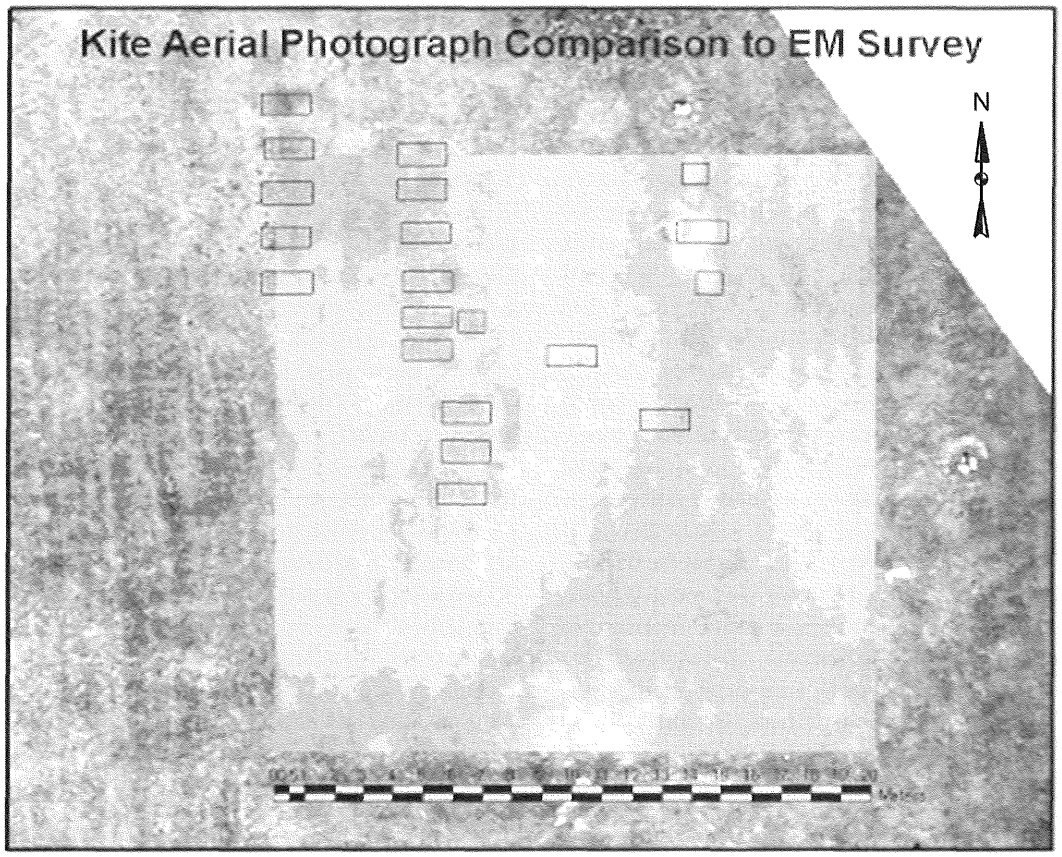


Figure 6. EM conductivity survey correlated to kite aerial photograph. Correlating features are delineated with rectangles.

undisturbed soil. EM conductivity surveys in April 2002 and March 2003 and the disinterment in March 2002 confirmed that increased porosity decreased apparent conductivity. When porous and undisturbed soils are saturated, all empty spaces between pores are filled with water. Given that moisture is a good conductor of electric current, saturated soil yields an overall high conductivity. As demonstrated in the April 2002 and March 2003 surveys, increased moisture produced increased apparent conductivity. During the April 2002 field session, one morning of surveying that took place in high levels of precipitation demonstrated no anomalous features compared to the afternoon when moisture had evaporated and anomalous conductivity readings became more apparent. These EM conductivity surveys implied that significantly moist soils, producing high conductivity readings, mask anomalous features, thus increasing the difficulty for locating and delineating unmarked graves. Again, moderate soil conditions are necessary for successfully delineating unmarked graves.

Eastern Kansas' clay-rich soils exhibit characteristic slow permeability; therefore, a few days may be required for sufficient internal drainage. Due to increased porosity from backfill material of an unmarked grave, water likely infiltrates more quickly than through undisturbed soil. Remaining moisture content of the disturbed soil, therefore, becomes distinct from very moist, undisturbed soil, assisting in a conductive response identifiable as an unmarked grave. When the moisture evaporates, the porous texture of backfill materials is less conductive than the more solid texture of the undisturbed soil. As shown in Figure 6, unmarked graves located in part of an EM conductivity survey sampling grid were correlated to vegetative tonal differences in kite aerial photographs.

Research revealed that apparent conductivity values are not always representative of the soil conductivity alone. For example, anomalously high apparent conductivity values are not always an indicator of a highly conductive soil. Buried metal objects are very conductive and can result in readings that are excessively high or negative (Bevan 1983).

The large anomalous feature in the southeast corner of Figure 3 illustrates a grave containing metal.

To conduct a geophysical survey with an EM ground conductivity meter, it is essential to know how different materials conduct electrical current. Research on Potter's Field evidently yielded unmarked graves probably containing metal, while others were detected because air was present, indicating that these graves had not deteriorated to the point of collapse. Thus, understanding the EM conductivity of metal material and air voids assisted in the interpretation of EM data.

As stated previously, kite aerial photography was successful in distinguishing vegetative tonal differences in the rowed, east-west pattern. Late spring was determined to be the best time to utilize aerial photography for detecting the vegetative differences associated with unmarked graves. Decreased EM apparent conductivity values indicated that the backfill material of the unmarked graves was more porous, allowing easy infiltration of springtime moisture to facilitate new vegetative growth. New vegetative growth apparent in late spring kite aerial photographs assisted in the identification of disturbed soils but was not evident in early spring photographs.

Conclusions

The 2002-2003 geophysical and remote sensing investigation of Emporia's Potter's Field demonstrated that technology, such as EM conductivity and kite aerial photography, has the capacity to locate unmarked graves in eastern Kansas cemeteries. The EM conductivity technology can produce a time-efficient, thorough investigation with good spatial coverage or can perform very precisely and accurately in a small area over an extended amount of time. However, research revealed that moderate soil conditions must be present in order for the EM-38 to be successful (i.e., for apparent conductivity values to yield anomalous features).

Kite aerial photography was successful for distinguishing vegetative tonal differences in the rowed, east-west pattern associated with Christian burial practices. The method is cost effective and time efficient and provides high-resolution photographs practical for delineating small features. This non-invasive method for identifying soil disturbances revealed unmarked graves outside of the plot map, which might have gone unrevealed using geophysical technology alone. On the other hand, research revealed that site location and seasonality might affect the success rate of kite aerial photography.

Great differences in soil properties can occur even within short distances (Neill 1981). Spatial variability is a factor that must be taken into consideration prior to every electromagnetic or geophysical survey. For example, Maplewood Memorial Lawn Cemetery burials are at a typical depth of 6 feet. However, in Tonganoxie, Kansas, in Leavenworth County, a cemetery has surface burials. Depth to bedrock in this area is approximately 100 cm below the surface (Zavesky and Boatright 1977). If one attempted to locate or delineate an unmarked grave in this region, it would be essential to consult the soil survey to determine the approximate depth to bedrock. In this instance utilizing the EM-38 in the horizontal dipole position might be more effective than the vertical dipole mode. Research should be conducted in different regions of Kansas in various soil conditions to determine which techniques of EM-38 would be most successful. Furthermore, research should be carried out in different regions in various soil conditions to determine if different geophysical technology would be more successful than the EM-38 in locating and delineating unmarked graves.

As in most field investigations, additional research is often necessary. However, cemetery administrators with questions about the existence of unmarked graves now have an option. Solutions may now be available for individuals or families, who wish to bury in certain parts of a cemetery but were previously refused because of suspected unmarked burials. In the past those who believed that they might encounter a burial could only probe the ground and check the topography, vegetative ground cover, and orientation of depressions or mounds. With the advent of geophysical surveying technology, however, there now is a way to determine whether a soil disturbance is a grave.

As stated earlier, this technology is not limited to cemeteries but can be applied to archeological sites as well. The knowledge of how to best utilize geophysical instruments in Kansas' clay-rich soils enables more precise and time-efficient archeological investigation. The instruments' capabilities to create imagery beneath the ground surface open up many opportunities for mapping, excavation, and straightforward analysis. They provide stepping-stones on the path to future discoveries.

Geophysical and remote sensing technology in Potter's Field has revealed 390 of the 705 individuals who left behind friends, families, and purposeful lives. Whether a minority, a child, or an anonymous person, the survey has given these individuals an identity for the first time in nearly 100 years.

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NOTES

Early Investigations of Archeological Sites in the Lower Walnut River Valley

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The lower Walnut River valley in Kansas was the location of numerous Native American sites long before its settlement by Americans. The remains of these villages and other sites began to attract attention by the late 1870s and have since continued to be of the subject of investigation by natural scientists and later, as the goals and methods of archeology developed, by professionally trained archeologists. Using stories from local newspapers and other primary documents, together with unpublished materials, this paper reviews these early investigations from ca. 1870s to Waldo R. Wedel's Smithsonian Institution excavations in 1940.

Background and Sources

The lower Walnut River valley, from the town of Winfield south to Arkansas City where that river empties into the Arkansas, was formerly the location of an extensive occupation by Native Americans (Figure 1). The expansive fields of the valley expose a seemingly boundless quantity of debitage and stone tools, not to mention the occasional piece of pottery or animal bone. On the untilled bluffs overlooking the river, especially adjacent to Arkansas City, are scattered numerous low mounds, ranging from a few inches to several feet in height. The Euroamerican communities of this stretch of valley were founded in the early 1870s, and almost from that time there were issued reports of the finds of pottery, deep subterranean pits, stone tools, and even human remains. By and large, the artifacts are now attributed to the immediate ancestors of the Wichita, though the remains of earlier cultures reaching back a few thousand years at least, also have been found on the bluffs or buried in the sediments of the valley floor. This paper, based on information from Arkansas City and Winfield newspapers and other primary published and unpublished materials, reviews archeological investigations in the lower Walnut River valley from the 1870s to Waldo R. Wedel's excavations on behalf of the Smithsonian Institution in 1940.

The use of the term "investigations" in this paper is intended in an ecumenical sense. Some stories are of accidental discoveries, while others describe activities that might best be thought of as looting. Many of the stories, however, relate earnest attempts at scientific enquiry. While clearly not excavations reported to modern standards or even always the standards of the era, the excavators observed closely what they found and offered reports not only to the local newspapers but also to various journals. A few dispatched information to the Smithsonian Institution. In the nineteenth century methods rarely were mentioned and interpretations tended to run the gamut from giants, Mound Builders, and lost tribes to more modern-sounding ideas, such as attribution of the mounds or artifacts to the Indians or even specific tribes. For some, anti-Native American ideas served as a justification for the elimination or dispossession of the Native Americans (see Kennedy 1994; Silverberg 1968). At the same time, it also must be conceded that the Native Americans presented an enigma to the citizens and savants of the developing United States. Native American populations were small, their technology seemed limited, few had seen Indians actually constructing mounds, and the accounts of this happening (by De Soto and others) were not widely read or were discounted (Dunnell 1991; Willey and Sabloff 1993). No single view dominated; rather, various ideas were widely debated. Many of the ideas, then as now, were disseminated in the popular media.

It must be borne in mind that the goals and even

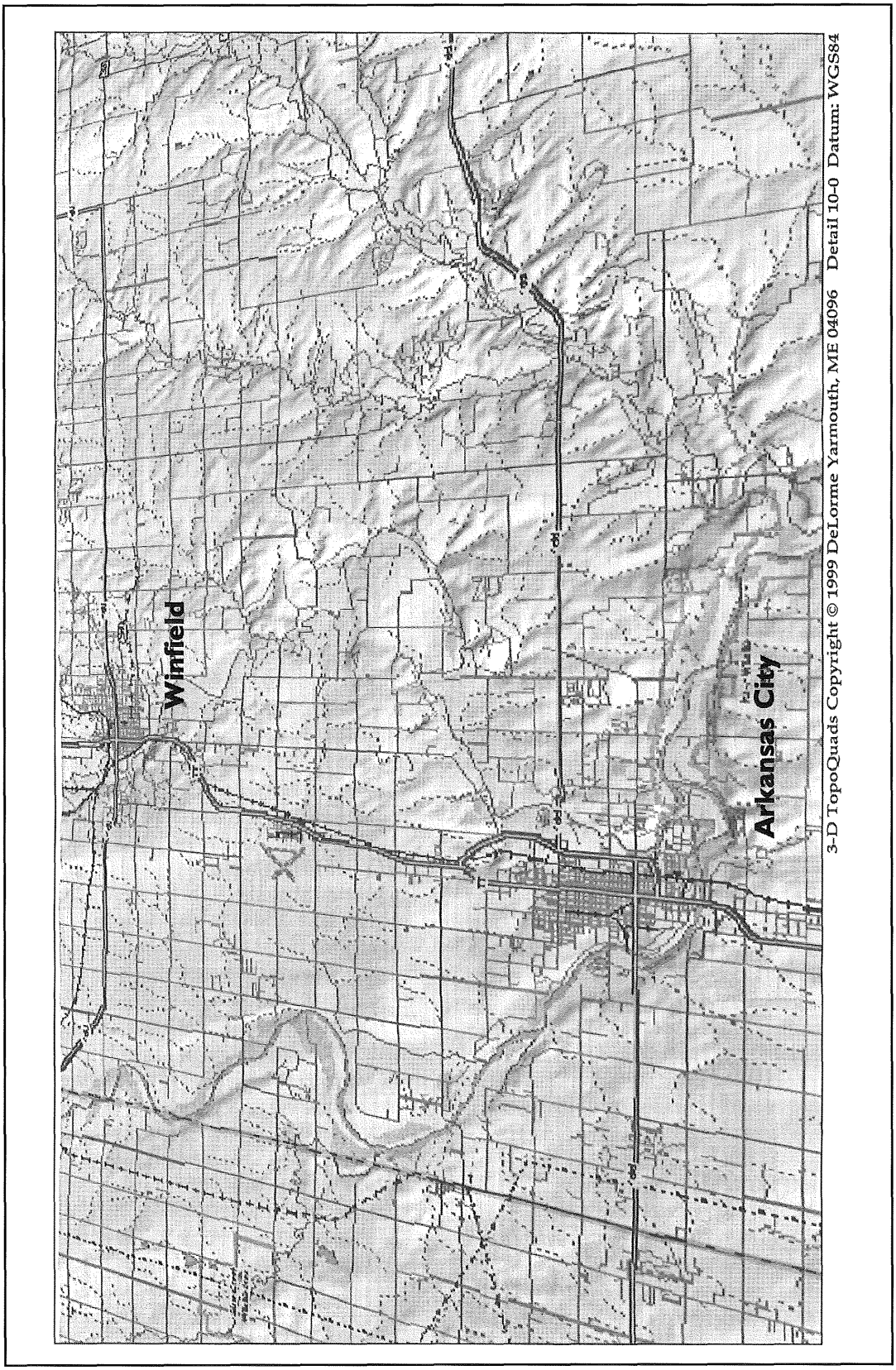

Figure 1. The lower Walnut River valley at Arkansas City.

the organization of archeology, or "prehistoric anthropology" as Wilson (1889:597) termed it in the late nineteenth century, changed considerably in the interval of these reports. Scientific activity shifted from a broad natural science base to numerous separate disciplines. The change, usually referred to as "professionalization," entailed the development of methods, theories, standards of reporting, terminology, and so forth by those who identified with a given discipline (Darnell 1970). By the time Wedel began his investigations in 1940, there was a discipline of anthropological archeology with its core values imparted by a growing academic community. Within this discipline practitioners considered themselves as "professionals," while those with little or no formal training were relegated to "amateur" status. The change is probably not quite as simple as that, as many historians of science have noted (see Goldstein 1994). "[S]cience in the nineteenth and early twentieth centuries was a more varied, widespread, and socially complex activity" than often is recognized. A professional community arose, to be sure, but rather than two distinct groups, professional and amateur, both potentially could be seen as "embedded within a more diffuse scientific culture" (Goldstein 1994:599).

The late Richard Kay Wortman and his wife, Mary Ann Wortman, brought the stories upon which this article is based to the author's attention. For many years the Wortmans gathered sources of local history, laboriously transcribing the old newspapers, and published *The History of Cowley County* in two volumes (Wortman and Wortman 1996; Wortman et al. 1999). Other information has been culled from the extensive files on website www.ausbcomp.com, which chronicles the history of the county, or are items that the author has come across in pursuing other research interests. The information has been supplemented by unpublished correspondence at the Kansas State Historical Society (KSHS) Archives (Archeology Correspondence file), the Smithsonian Institution National Anthropology Archives, Waldo R. Wedel Papers, and the Natural History Museum of Los Angeles County, as well as various published sources as enumerated in the bibliography. Doubtless this sampling is far from complete.

Prelude: The Ante-diluvian World Revealed

It remains uncertain when the first reports of a substantial prehistoric settlement in the valley began. In 1876 Wirt W. Walton, editor of the *Winfield Courier*, delivered a lecture on the "History of Cowley County" at the July 4th celebration of the United States centennial and made the following comments.

> ... From the dim traditions of the past, then, I learn that a few thousand years ago the fertile valleys of the Arkansas and its tributaries, was the home of a mighty people. Not such a live, rushing people as dwell here to-day, but a happy, contented people. A people who "fed their cattle on a thousand hills" and lazily watched the birth and death of centuries. Their names we know not and even their origin is veiled in the abyss of the great unknown past. This we do know, however: they were a people well versed in the arts and sciences and stood far in advance of the savage tribes that occupied this beautiful land, when the continent was first discovered by Columbus. The time-worn mounds and aqueducts of the aborigines still standing, from the Mississippi to the Colorado in the west, speaks in a language not to be misunderstood, of the wealth and industrial power of these pre-historic people. A people who caught the torrents from the mountain tops and carried them down an easy prey to fertilize the plains below (*Cowley County Democrat*, 13 July 1876).

Walton obviously was referring to the Mound Builders, the ancient race said to have pre-dated the Native Americans. Whether Walton's comments were based on firsthand observation is an open question, although there is nothing specific to ground his remarks in the lower Walnut River valley.

In the years that followed, other published stories related discoveries and interpretations of archeological finds throughout the country. To the modern reader the stories range from the absurb to the credible. There was the story in 1877 from Grouse Creek east of Arkansas City about "a huge Bone, perfectly sound ... the exact image of a human being" (*Arkansas City Traveler [ACT]*, 26 September 1877), which soon was revealed as a hoax (*ACT*, 19 December 1877). Even more outlandish was the report of a cave near Wilmot "covered with hieroglyphics" where there was found "the petrified body of a man 10 feet high, one large stone ax, weight 50 pounds" (*Winfield Courier [WC]*, 10 February 1881). The tale grew in the telling until it was said that the explorers found a stream with blind fish; used mastodon bones for fuel; and found petrified snow shoes, "a pair of garters, a night shirt, a

pocket flask, and a huge demijohn, all turned to stone" (*WC*, 17 February 1881). Shortly came word that the good citizens of Wilmot pronounced "the hoax of last week a good one" (*WC*, 17 February 1881). The stories of hoaxes and stories of the Mound Builders vied with those linking the Native Americans to the Hebrew. "INDIAN AND HEBREW, A Comparison of Some Customs of the Two Races," the story read, continuing "Early travelers among the Indians claim to have found rites and ceremonies strikingly similar to those of the Jews ..."(*Winfield Newspaper Union*, 28 March 1891).

Closer to home, the *Winfield Courier* of March 22, 1883, ran a story on the investigations of Judge E. P. West, a self-taught geologist and archeologist, then in the employ of the University of Kansas (KU), as reported in the pages of Scientific American.

> It is well known that the wrought-stone implements found in the ancient river gravels of California prove conclusively that during or before the glacial period the Pacific coast was inhabited by man. In a report on archeological explorations in Kansas, Judge E. P. West of that state, [reports] a large amount of evidence to show that at an equally remote period that region was peopled by a race compared with whom the mound builders must be accounted modern.
>
> The geology of the region is simple. Prior to the drift epoch the river channels were deeper than now, and the river valleys were lower. Subsequently the valleys were filled by a lacustrian deposit of considerable depth. In or beneath this last deposit the remains of an extinct race occur.

Loess was then thought to be water-lain rather than aeolian in nature. Many of the finds were buried in alluvial or colluvial deposits that were post-glacial in age.

> Such remains have been found at various depths in seven different counties along or near the Kansas Pacific railroad, namely, Douglas, Pottawatomie, Riley, Dickinson, Marion, Ellsworth, and Lincoln counties. With one exception the remains have been found on the second bottom or terrace of streams, and consist of stone implements, pottery, human bones, and bone implements. In most cases they were struck in digging wells at a depth of from twenty to thirty feet below the surface. In view of the fact that there is not more than one well to the square mile in the counties named, and the area of a well forms but a very small fraction of a square mile, Judge West thinks the evidence already obtained not only sufficient to prove the former existence of the buried race, but to prove that they were very numerous. We can hardly assume that chance has directed the digging of wells only where human remains were buried.
>
> Whether this race existed before the glacial epoch, or immediately after it, is too early to determine. Judge West is inclined to fix their time of occupancy as after the glacial epoch and prior to the deposition of the loess. In calling upon the local newspapers of Kansas to lay the facts before the people and urging the propriety of saving such remains when found, and noting carefully the conditions under which they occur, the Judge says:
>
> "Here we have a buried race enwrapped in a profound and startling mystery—a race whose appearance and exit in the world's drama precede stupendous geological changes marking our continent, and which, perhaps require hundreds of thousands of years in their accomplishment. The prize is no less than determining when this mysterious people lived, how they lived, when they passed out of existence, and why they became extinct."

The sites, although often deeply buried, were nonetheless post-glacial. Undoubtedly, the sites range considerably in age, though the sites in Marion County on the Cottonwood River are known now to date to the last 500 years and are generally contemporaneous with the finds and sites in the lower Walnut River valley reviewed in this paper. Depth of burial is not always an indicator of great age.

Down in the Valley

Stories of Mound Builders, giants, lost tribes, and pre-glacial epoch settlement of the continent all had wide currency in the late-nineteenth century, and, regardless of how they were perceived by the public of the day (or by modern archeologists), they did keep the subject of archeology in the public's mind. Credible reports of investigations in the lower Walnut River valley began to come in by the late 1870s, such as the description below of A. R. Reinsch's work in probably 1879 or 1880.

Figure 2. Mounds on the bluffs at the Arkansas City Country Club site.

> Explored two mounds on [the] Walnut River, in Cowley County, Kansas. [The mounds] are 30 rods [circa 165 feet] apart, 30 feet in diameter, and at present 18 inches high. They were originally between 3 and 4 feet high. A trench 3 feet wide was dug to the centre of one of them. Bones, potsherds, charcoal, jasper chips, and arrow-points were found at a depth of 6 feet, or about 4 feet below the surface (Mason 1881:446).

Reinsch sent details of the excavations to the Smithsonian Institution, including "drawings of implements, among them a hollowed grinding stone of whitish limestone." Several years later in 1887, Reinsch, then a KU student, donated to the nascent Kansas State Historical Society the "[s]keleton of an Osage Indian, exhumed near [the] Walnut River, Cowley county, Kansas" (Adams 1890:160). KSHS accession records indicate that the skeleton, which apparently never actually came to the institution, was "removed some five years ago by the donor from a grave on the Walnut River in Cowley County, N.E. of Arkansas City" (KSHS Archeology Laboratory, Topeka, Accession File 87.11, condition evaluation form by Verna Detrich, ca.1985). While it seems likely that the skeleton was removed from one of the two mounds reported earlier to the Smithsonian, it is equally possible that Reinsch continued his explorations in the lower Walnut River valley and in 1882 excavated the supposed Osage skeleton. The extant records offer only the most limited context for the skeleton, but it is certainly possible that it was removed from one of the extensive Wichita sites in the Arkansas City area (Figure 2).

Two years after Reinsch excavated the burial, a local hog farmer, named John T. Cue, found

> ... a quaint specimen of earthenware ... while repairing a breach [in a dam] [o]n his ranch. The specimen is a portion of a large jar with one handle complete. The material resembles pounded shells, and is a dark brown on the outside, and a reddish brown on the inside. Mr. Cue obtained the fragment twelve feet below the surface of the earth, and it was firmly imbedded in the packed gravel. Whether it belongs to the age of the primitive inhabitants, or is due to the presence of the Spanish explorers is indeterminate. Persons desirous of examining this curiosity can do so by calling upon us at [the newspaper] office ... (*Arkansas City Republican*, 2 August 1884).

Cue, the newspaper went on to say, planned on forwarding the pottery to Mt. Union College in Alliance, Ohio, to be placed in its museum. A check with the college in 1996 revealed that the museum in question had long since been discontinued and most of its collections dispersed (Robert G. Wiese, Jr., Professor of Geology, Mt. Union College to M. Hawley, letter, 8 March 1996). The description of the vessel fragment, especially its temper, indicates that it was a portion of a Cowley Plain pot. The depth of burial in packed sand further suggested transport and secondary deposition of the vessel rather than in situ deposition in a deep storage pit.

In May 1893 a rural Arkansas City farmer named E. S. Beavers

> ... was obliged to penetrate an ancient mound located on the spot where he decided to dig a proposed cellar. He found that the mound contained caves or recesses, about a foot and half wide at the top, which assumed wider proportions as they went down until they were about seven feet wide. The caves contained human bones, pieces of pottery, ashes, and charcoal. Large flint implements, probably used for cutting purposes, were deposited in a small cavity in the bottom of the largest cave...
>
> These bones found in the mound did not show any marks of fire, although they were badly decomposed and only small portions could be preserved. No complete skulls were found, but Mr. Beavers found an upper jaw containing five well preserved teeth. A great many fragments of pottery and arrowpoints were picked up on the surface of the mound, located on a high ridge on the east side of the Walnut river, and about 200 feet above the river bed. The mound measured about 30 feet in diameter at the base, and was about four feet in height. It was composed of earth and stones, the latter being different from any stone that is found in the bluffs in that vicinity. They were evidently carried from a distance. Several other mounds were explored on Mr. Beavers' farm, but nothing of interest was found. The reporter commented: "There are three mounds that have never been explored."
>
> Mr. Beavers stated he was inclined to believe that these peculiar caves were constructed many years ago, before the period of the red Indians, and belong to the ancient cave dwellers' age (*ACT*, 15 May 1893 in Wortman and Wortman 1996:9-10).

Intermittent excavation followed over the next few years. Then in late 1896 the pace of activities increased. On Thursday, December 17, 1896, the *Arkansas City Traveler* reported on the "REVIVAL OF INTEREST In What the Mounds of Cowley County Contain. Some of Our Citizens Digging Into Them Lately." The story went on as follows.

> Lately there has been a revival of interest in the mounds that are located in Cowley County and a number of our citizens have been digging into them during the fine weather we have enjoyed the past month. The idea that this country was once inhabited by another race several hundred years ago is more prevalent than it was. In the minds of many there is not the least particle of doubt but that the mound builders were here long before we were.
>
> Several years ago the St. Louis Republican published a lengthy article upon the mounds in the United States. It referred to the mounds to be found in Cowley County as being the best for investigation; that the best finds had been made in the mounds here. The principal cluster of mounds in the county is on the farm of E. S. Beavers, two and a half miles east of the city. There are four or five of them there and they have yielded up already several fine specimens, as well as furnishing considerable historical data for scientists. However, a complete overhauling of the mounds has never been made. In the past five years a number of our citizens have gone to these mounds, dug into them, and secured a few specimens.
>
> During the boom when farms were being laid out into town lots, Mr. Beavers talked of platting his farm in ten acre tracts for suburban residence purposes. He thought of building a big residence himself and as a site selected one of the mounds on his farm. He sunk in a cistern at the edge of the mound, did some other digging, and unearthed a few specimens. However, the boom went back on us and Mr. Beavers never built his residence nor finished his excavations.
>
> The mounds on Mr. Beavers' farm are good sized ones. They are about three feet high and forty feet in circumference. These mounds have attracted the attention of several citizens here who are interested in scientific research. Several years ago Dr. C. S. Acker

went out and dug into one of the mounds a short distance and secured several rare specimens. He took out a number of arrowheads, pieces of pottery, stone ax, bones of human beings, etc. He never followed up his first investigations. He has intended to but has put it off from time to time.

Dr. Guinn has also dug into the mounds and secured several specimens of arrowheads, bones, pottery, stone ax, stone mallet, half face of an idol, a mortar, two bricks, etc. Some of the pottery specimens contained carvings. The two bricks, an old Indian informed the doctor, were formerly used for the rubbing of hides, taking the fat and hair off. The doctor is interested in investigations of this kind .... A day or two since C. C. Sollitt and C. N. Hunt visited the mounds on the Beavers' place and did some digging. They, too, found arrowheads and some bones. Mr. Hunt found a piece of a stone urn. Next Monday, C. N. Gould, one of the best geologists in the state, will come here and visit the mound and make some investigations. There is little doubt but that he will find something that will be of interest.

The day before this article was published, the *Traveler* reported a meeting by the "Natural History Society," an apparently local group, which took place the afternoon of Wednesday, December 16, 1896. Several papers were read, including one by Dr. J. H. Guinn of Arkansas City, on "the excavations he has been conducting among the ancient mounds." The article concluded with mention that the society meeting "adjourned to the museum where an hour was spent in examining the various collections. General surprise was expressed that so much had been collected in so short a time" (*ACT*, 16 December 1896). Whether portions of the collections were of an archeological nature, the article does not say; presumably some were. According to the article, R. B. Dunlevy, F. H. Rose, and C. N. Gould were elected as curators. The location of the museum was not given, but it is known that Robert Dunlevy was the curator of a museum on the Southwestern College campus at this time (Jerry Wallace, personal communication 2003), and so it seems likely that the museum there is the one mentioned in the article. The Natural History Society was apparently also associated with the college.

On December 21, 1896, members of the Winfield-based Cowley County Historical Society visited the area. Included in the group was Southwestern College undergraduate Charles N. Gould, then a budding geologist who was evidently quite well known and respected locally. According to Gould (1898a:80), the mounds, of which it was estimated that there were about a dozen, "have been greatly worn, are circular in shape, from 20 to 30 feet in diameter, and from 2 to 5 feet high in the center." The group opened three of these mounds.

> At a depth of 1 to 3 feet from the surface, fragments of charcoal began to be found; these increase with depth, until at from 4 to 10 feet deep, the soil is in a great measure replaced by charcoal and ashes. Intermingled with this charcoal are found broken pieces of pottery, apparently formed of broken shells mixed with clay and baked. No entire vessels have been found; but, judging from the fragments, they were shaped like a deep tin wash basin, probably 6 inches deep and 10 to 12 inches in diameter. Several handles resembling those of a jug were found. The pottery is usually blackened with fire on one side, showing that is has been used.
>
> Besides pottery were found a number of implements, including stone hammers and axes, mortars for grinding grain, flattened stones for dressing skins, flint arrow-heads and axes, and grooved stones, apparently for sharpening implements, numerous flakes of flint, also two species of Unio, the bones of the following mammals: buffalo, elk, deer, rabbit, two species of mice, coyote, together with the remains of tortoise, a gallinaceous bird [pheasant or quail], and fish (Gould 1898a:80).

Gould, who was the first to report the aboriginal chert quarries southwest of Maple City in Cowley County and who went on to found the Oklahoma Geological Survey, worried about the fate of the area's archeological remains. "A few years since a cellar was dug on the site of one of these mounds, and the gentleman informed us that a half bushel of stone axes were thrown out in the loose dirt and carried away .... It is to be regretted that these relics, which are of no little scientific value, should be lost by those who have so little appreciation of their importance" (Gould 1898a:80).

The day following Gould's excavations, Charles N. Hunt (later mayor of Arkansas City) and a medical doctor, Dr. Charles S. Acker, "were at the mounds ... and dug into the earth eight or nine feet in the largest

mound" (ACT, 23 December 1896 in Wortman and Wortman 1996:10-11).

> It is quite a fad now for people to visit the ancient mounds east of the city on the Beavers' farm and dig a bit to see what they can find. The greater portion of them do not dig very long and a few feet down makes them content with the find of small relics. There are others determined to investigate fully.

The article suggests that Hunt and Acker were more persistent than many of the others: "They were at the mounds yesterday .... They say there are a dozen more mounds over there and in time intend 'wading' through them all."

Various reports detail the excavations; characteristic among them is a brief report given by an observer in the pages of *The Antiquarian* in 1897 (and which follows closely the reports in the *Traveler*):

> Recent excavations made into prehistoric mounds ... in Cowley County ... have brought to light the fact that the largest of them is a "sacrificial mound," and the explorers have uncovered a sacrificial altar ... The investigators ... tunneled into the interior of the mound, came upon a number of stones so arranged as to form a vault or a small chamber. After removing these stones they found an empty space of little more than a foot in depth, where they came upon ashes. Mixed with these were found a few charred pieces of human bone, such as a femur of a child, two vertebrae—the axis and atlas. This layer of ashes varied from two to six inches in thickness (Johnson 1897:95).

The *Traveler* article noted that this upper "vault" was found "about four feet beneath the surface" of "the big mound." Another layer of ash and the excavators were upon "a reddish brown cement," which filled in around a supposed stone altar (Johnson 1897:95).

> This altar consisted of two large stones, peculiarly fashioned and wrought so as to present, in the position found, a basin—or, more properly, a perfectly formed pelvis, with the pubic arch of the same formed so that each segment met its fellow with a nicety that seemed marvelous .... This altar was the most sacred altar ... made to represent those portions of the human body which at the earliest dawn of history were considered sacred, the pelvis and heart (Johnson 1897:95).

The stone below the altar was smooth, native limestone. The depth of the so-called altar, about 8 feet, would seem to suggest that the men were in a storage pit, the base of the pit likely terminating at bedrock. In any case, perhaps more interesting was the mention of "[s]tone hammers, flint hatchets, flint knives, stone pipes, portions of a necklace, arrow points, spear points, bones of animals and men and various pieces of pottery" (Johnson 1897:96). One piece of pottery stood out: "It is highly decorated and colored, and is a very superior piece of work. The decoration consists of three parallel lines, one blue and two red, running around the pottery at the top" (Johnson 1897:96). Possibly the sherd represented some type of tradeware, most plausibly from the American Southwest.

Hunt and Acker were so impressed by their initial success that, according to Hunt's son, Elwin, they and two other men "formed a small private company for exploration of some of these mounds. They spen[t] about $500 in excavation and research work, and gathered a large mass of Indian curios" (E. Hunt to W. Connelley, letter, 21 February 1932). Indeed, from the week after Christmas 1896 into 1897, the men labored among the mounds, recovering a complete ceramic vessel. The accompanying story offered the first detailed description of what has come to be known as Cowley Plain pottery (see Wedel 1959).

> In the mound they please to call the Sacrificial mound ... in excavating at a distance of about ten feet to the north and two feet beneath the strata or layer of ashes, at this point about six inches thick, they came upon a vase or urn made and used by prehistoric man, the most perfect and best preserved urn of the kind and period yet found in this country ....
>
> The material composing the urn is somewhat similar to early Celt pottery, having been formed of a coarse clay, mixed with small pieces of shell and a very few minute pebbles, and having been moderately well baked, possibly in the sun, but more probably by surrounding it with combustible vegetable matter .... The color of the vase on the external surface is a dark slate, interspersed with white and pink particles of glittering shells, while the internal surface is uniformly of a pale terra

cotta or light tan color, in shape somewhat resembling the ancient Egyptian vases, while in proportion it shows good form and proper symmetry, its dimensions being as follows: Height about 10 inches, at the greatest circumference measuring 33½ inches, at the neck or inward curve 25 inches, the rim on top 26½ inches, through its two handles which are uniform and symmetrically fashioned, 30 inches, from the center of the handles to the margin of the rim the distance is 4½ inches; while from the point of attachment or conjunction of the upper and lower part of the handle to the body of the vessel is 4 inches, the handles themselves being 2 inches in circumference. The thickness of the body of the urn varies from three sixteenths of an inch around the rim to one fourth or possibly a trifle more about the ... body of the vase (*ACT*, 30 December 1896 in Wortman and Wortman 1996:11) (Figure 3).

Figure 3. A Cowley Plain vessel.

The find near the pot of "a single tooth, evidently the incisor of (a) man," it was said, "from its dimensions, points to that distant age when giants walked the earth" (*ACT*, 30 December 1896 in Wortman and Wortman 1996:11). Following the more or less complete excavation of the so-called sacrificial mound, the group promised soon "to commence the excavation of another mound" and so on, one presumes. The collection of artifacts in these excavations, which was said by Elwin Hunt (E. Hunt to W. Connelley, letter, 21 February 1930), to include "the remains of several flintlock rifles" was put "on display in a building on one of the main corners of the city." The building, located at the corner of Summit and East 5th in Arkansas City, burned to the ground one night, the fire destroying it and the collection it housed. Notably, no contemporaneous mention of European contact items was made in the local papers, the account published in *The Antiquarian*, a brief report in the "News and Notes" section of *American Anthropologist* (Anonymous 1897:54), or in information forwarded by Charles Acker to the Smithsonian Institution (see Wedel 1959:355-356, 361). Possibly the story of the flintlocks alleged to have been unearthed from the mound stems from a misunderstanding by Elwin Hunt. The men may well have had other materials in their "museum" than those excavated from the Beavers' farm that could be seen in a photo of the exhibit that Hunt possessed (E. Hunt to W. Connelley, letter, 21 February 1930) and which thus may have sparked the story. The possibility exists, too, that the men did at some point in the course of their digging find the remains of flintlocks.

Meanwhile, Charles Gould, now an elementary school teacher in Maple City (Gould 1959), made an interesting and important discovery in the uplands of southeastern Cowley County. While scouting the area for geological features, Gould (1898b:79) stumbled upon, and wrote two accounts of, what he initially took to be the remains of collapsed, stone houses.

> On a crescent-shaped ridge about a half a mile long and from 50 to 150 feet wide the hard but brittle limestone has been quarried in great quantities, and has apparently been piled up in the form of rude edifices, which have long since crumbled down .... In certain areas of perhaps half an acre the loose rocks cover the ground to a depth of three to four feet. It is these places, protected from fire, that a few dwarf trees are growing. These trees ... have given the name "Timbered Mounds" to the hills.
>
> No marks of tools have been discovered on the rocks; but in some places there are traces of fire. The quantity of rock quarried is great. It has been estimated that it would take 100 men six months to loosen the rock from its original position. Now if we remember that probably none but the rudest implements were used in the work, we will conclude that the time occupied was long. Beside the hill described there are at least four

Figure 4. The aboriginal quarries near Hardy, Oklahoma, 1920s. Photo by Bert Moore.

> others, within a radius of three miles, covered with the same kinds of ruins ....

After reviewing theories to account for the ruins, such as ancient mines, fortifications, residences, ceremonial areas, and burial mounds, Gould (1898b:79)—following a suggestion by Samuel Wendell Williston, KU's polymath—concluded rightly that "the ruins mark the sites of ancient flint quarries" (Figure 4). Moreover, his participation in the mound explorations near Arkansas City the year before led him to make another important observation:

> ... probably the plains tribes from the west obtained their arrowheads and flint implements from this locality. This is further substantiated by the fact that the flint implements found in the prehistoric mounds at Arkansas City, some 20 miles northwest, contained fossil Fusilina cylindrica, which are characteristic of the flint mentioned (Gould 1898b:79).

Thus Gould provided a link between the extensive quarries in the southern Flint Hills and the villages located in the lower Walnut River valley. He continued to explore the area, reporting a year later that he had found "more than 100 imperfect implements, or rejects" (Gould 1899:282). These artifacts were typically "three to eight inches in length, and from one and one-half to four inches in breadth, and weigh from three ounces to one and one-half pounds. In shape they are usually oval and twice as long as broad, end roundish or pointed, with usually a cutting edge chipped on all sides. They are nearly always broken ...." (Gould 1899:282). Comparison of the site, its surface features, and artifacts with the then recent investigations near Peoria, Oklahoma, by William Henry Holmes (1894), suggested that the sites were fundamentally similar (Gould 1899).

The next report is not from a local newspaper but from the pages of *The Archaeological Bulletin*, another archeological journal of the day. In his column, "Miscellaneous Notes," George Remsburg, a native of Atchison County, Kansas, wrote about a November 1916 find.

> The skeleton of a man believed to be from five hundred to two thousand years old has been dug from an Indian mound on the T. J. Phillips farm, two miles southeast of Arkansas City, by Bert Moore, formerly Cowley County assessor, and a party of friends. Many Indian relics were obtained from the mound. J. A. Sterling and W. H. Martin, anthropologists from the University of Kansas, are here to take the skeleton to the university museum (Remsburg 1917:8-9).

Figure 5. Digging on the Tom Phillips farm, 1916.

The mound in question, according to Moore's testimony to Wedel (1959:355), was situated at the location of the present-day Country Club building on the Arkansas City Country Club grounds east of the city (Figure 5). The mound covered four apparent storage pits, one of which contained the burial. John Sterling, later a medical doctor in St. Louis, was a KU student, while Harry Martin, the son of paleontologist Handel T. Martin of Twelve Mile Creek paleoindian site (14LO1) and El Cuartelejo Pueblo (14SC1) fame, assisted his father in the natural history museum on campus. Several other local people participated, including Moore, Arthur Parker, and J. H. and C. C. Smitherman, initiated the excavations. When in the course of the work human remains were encountered, a telegram requesting assistance was sent to KU. Sterling and Martin removed the skeleton to the the university, where it is now housed at the Museum of Anthropology. Of particular note is that the pit containing the skeleton also contained two gunflints, gun parts, and two rolled brass cones. The contact items were not mentioned in the published note but were catalogued with the collection in Lawrence. The gunflints might not have been recognized as such by Moore and his associates. Moore had native-made gunflints from the eighteenth-century sites in Kay County, Oklahoma, but in his later correspondence with Arthur Woodward he seemed unaware that these were indeed gunflints (B. Moore to A. Woodward, letter, 22 May 1940).

Outposts, Campsites, and Forts

In 1930 Elwin Hunt, son of Charles Hunt, an early excavator of the Country Club site mounds, wrote to William E. Connelley, the KSHS secretary. Hunt, a feature writer for the *Arkansas City Daily Traveler* and friend of Bert Moore, regaled Connelley with tales of his father's excavations and the artifacts uncovered, as well as details about other sites in the area. A collector himself, he had "on display in a window downtown now a bunch of Indian relics, fish spears, flint punches, buffalo scrapers, arrow heads, scalping knives, short dagger points, etc., taken from the [W]alnut river which is still rich in such relics" (E. Hunt to W. Connelley, letter, 26 February 1930).

Connelley was intrigued enough by the stories that he offered to dispatch Mark Zimmerman, his man-at-large in archeological matters, to conduct further explorations of the mounds in the area (W. Connelley to E. Hunt, letter, 27 February 1930). The focus of the investigations was to be the mounds at the Country Club site (E. Hunt to W. Connelley, letter, 4 March 1930). Connelley, however, was dead within a few months, and nothing further happened.

Hunt did write to Connelley's successor, Kirke Mechem, in 1932. Interestingly, even at this date Hunt asked after "a race of people of more than average proportions"—giants—"having lived once in this section?" (E. Hunt to K. Mechem, letter, 21 March 1932). The question arose in the wake of the find on a nearby farm of "a giant tomahawk head w[e]ighing about 7 ½ pounds" at a depth of 6 feet. Mechem forwarded the letter to Zimmerman, who thought that the axe possibly came from a deep storage pit. There was nothing particularly unusual about its size either, he concluded (M. Zimmerman to K. Mechem, letter, 25 March 1932). So far as is known, this ended the exchange.

Albert F. "Bert" Moore, a recurrent figure in the archeology of the area during the early and mid-twentieth century, was born and reared south of Arkansas

Figure 6. Bert Moore with wife Mary, probably in the 1940s.

City on 140-Foot Hill (Figure 6). From the 1890s onward, he took an interest in the sites in the area, collecting from the famous eighteenth-century Wichita sites of Deer Creek (25Ka3) and Bryson-Paddock (25Ka5); the Maple City, Kansas, and Hardy, Oklahoma, quarries; and other sites in the vicinity of Arkansas City (Figure 7). Moore and his wife Mary also photographed rock art sites in the area. He served as a guide to Wedel's 1940 Smithsonian expedition (Wedel 1959:xv, 355), to Albert Spaulding in 1946 (Hawley 1992), and soon after to Robert Bell (Bell 2000). At Wedel's suggestion he corresponded with other archeologists, such as Arthur Woodward, and even gave a small collection of gunflints and other artifacts to the Los Angeles Museum of History, Science and Art. The remainder of the collection, totaling several thousand artifacts, was ultimately donated to the Oklahoma Historical Society. Unfortunately, he seemingly did not catalogue his collection nor was he even too concerned about keeping artifacts from different sites separate. He was in contact with Joseph Thoburn, a historian-archeologist with the Oklahoma Historical Society, and Thoburn's assistant, Otto Spring. The subject of much of this correspondence—indeed, the focus of a great deal of Moore's attention—was the eighteenth-century Wichita sites, Deer Creek and Bryson-Paddock, across the border in Kay County, Oklahoma. He penned at least one short article on the sites (Moore 1928). By the 1920s he had come across a reference on a map, one that he took to show an early settlement named Ferdinandina at the location of either the Bryson-Paddock or Deer Creek site. Mildred Wedel (1981:51-56) has implicated Moore's confusion about this map as the genesis for a persistent myth regarding these sites as the location of an eighteenth-century French outpost. Elwin Hunt championed the story in the local press (E. Hunt to W. Connelley, letter, 30 February 1932).

The presence of French or even earlier Spanish intrusion into the area was then and is still a topic of considerable interest. Besides the Deer Creek and Bryson-Paddock sites, there was the report of flintlocks by Elwin Hunt, though this may be the result of a mistake, and the contact items from the 1916 excavations in which Moore was also involved. By the early 1930s there was another report of European-contact artifacts from the area. *Kansas, A Guide to the Sunflower State* (originally published in 1932) contained the following statement.

> On the SITE OF CORONADO'S CAMP, at 8th St. and Walnut River [in Winfield], now occupied by the Consolidated Flour Mills, it is believed the Spanish explorer and his band camped after crossing the Walnut River at Kickapoo Ford. A rusty piece of a sword and other broken implements of Spanish origin have been found on the site (Federal Writers' Project 1984:470).

While there is no evidence that Coronado and his men were in this part of what is now Kansas, other Spanish explorers may have been. Don Juan de Oñate, governor of New Mexico, and a company of men traveled into the plains in 1601 and arrived at a "Great Settlement," possibly the complex of sites near Ar-

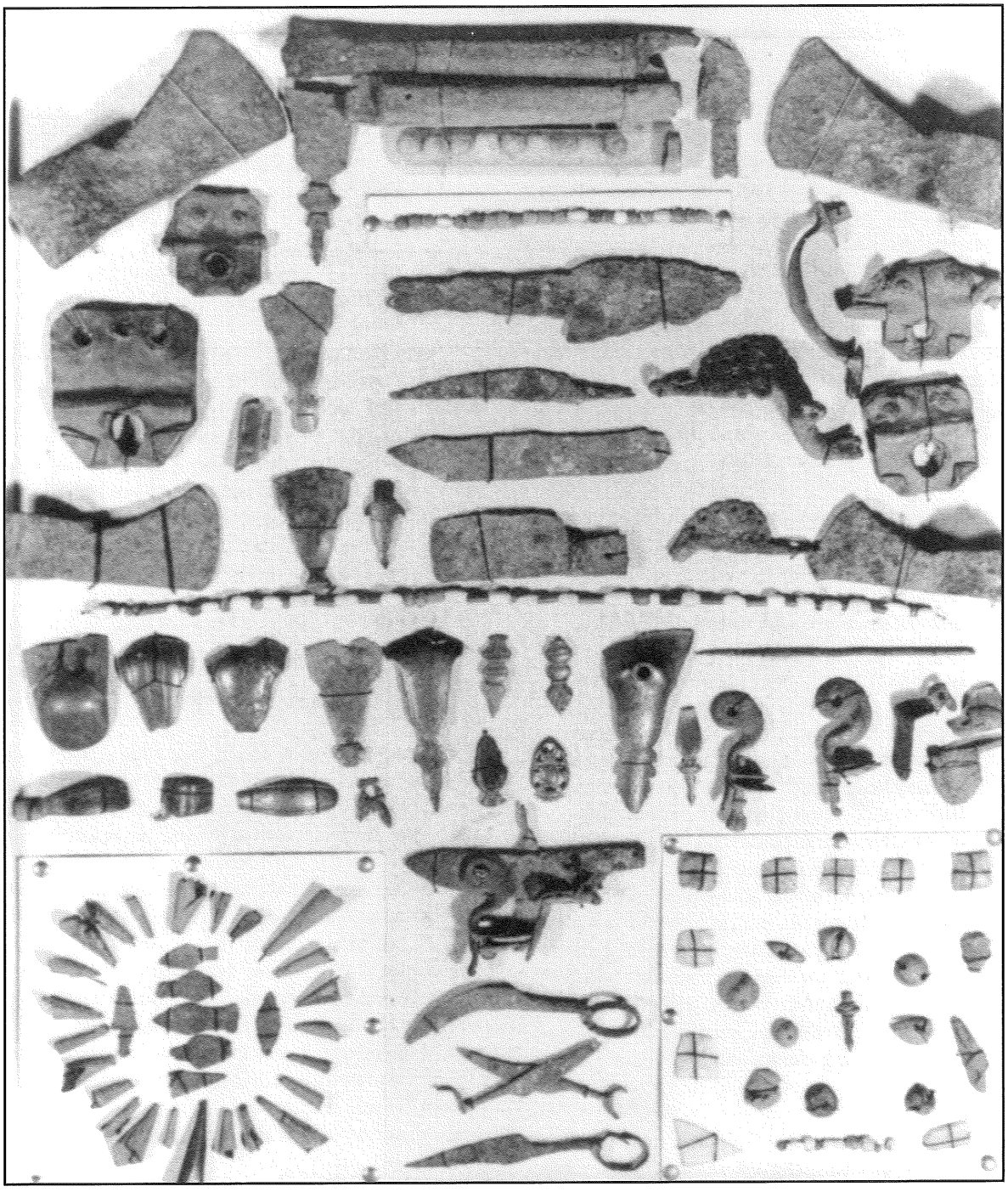

Figure 7. A portion of the Bert Moore collection of European-contact artifacts from the Deer Creek and Bryson-Paddock sites, Oklahoma. Photo by Bert Moore.

kansas City (Vehik 1986). The Spanish found a major series of Wichita villages, all but abandoned as the natives fled in advance of the interlopers (who were trailed by additional numbers of hostile natives, the Escanjaque). Although Oñate desired to push north, his men balked, and after skirmishes with the Escanjaque, the Spanish returned to New Mexico (Hammond and Rey 1953). In the end the Spanish were not in the valley for more than a few days. As of yet no conclusive evidence for their presence has been found despite two large-scale salvage projects in the sites near Arkansas City in the 1990s that employed extensive use of "total" recovery techniques (i.e., water flotation).

In 1935, four years prior to systematic investigation in the valley, O. D. Sartin, an Arkansas City man touted to be an "authority on ancient tribes," was said to have found evidence of "a vanished race of fort-building Indians." An article in the *Topeka Journal* (1935) expounded on his finds.

> The forts, discovered by an inquisitive cowboy, indicate a race older than the Osage and Kaw Indians found here by the white men ... and give evidence that their builders were unusual strategists who had disappeared long before the French and Spanish invasions.
>
> Sartin said he had communicated with research groups but had been unable to find any who had heard of or seen similar forts. That they were built by Indians, he is certain because no evidence of white occupancy has been found. Built along a four-mile front, the fortresses are so placed that surprise attack would have been impossible. Circular store rooms, one of which yielded three gunny sacks of arrow heads, indicated to him ... that the tribesmen lay back of their stone ramparts fully prepared for siege and attack. Sartin also found hundreds of arrow heads surrounding the forts at approximately arrow-shot, indicating they were attacked at one time.

The description calls to mind the pits at the quarries near Maple City and south into Oklahoma and also Gould's "timbered mounds," though Sartin seems to have been aware of the quarries.

> Of their domestic utensils, Sartin found only fire pits, some hollowed stones and a few fragments of pottery. Their flint mines, carefully lined with stone as they worked deeper into the earth in search of flint for arrowheads, also have been excavated by Sartin for miles around the bluffs on which the forts were erected.

Sartin also claimed to have found burial grounds or at least so said the article.

> Investigation of their burial grounds indicated that many bodies apparently were stuffed into crevices in the rocks instead of being buried. This characteristic was also noted by archeologists who investigated the famous cliff dwellings of Mesa Verde, Colo.

Putting aside the possibility of exaggeration by either or both Sartin and the reporter, the article still suggests that the so-called forts were part of the extensive quarries of southeastern Cowley County. Doubtless there are more quarry localities than have been surveyed by professional archeologists. The alleged presence of so great a number of projectile points further suggests specialized workshops near the quarries, though this remains speculative.

The Smithsonian Comes to Town

In August 1940 Waldo R. Wedel, an archeologist with the Smithsonian Institution, arrived in Cowley County, following fieldwork at sites in Rice County. The season was his fourth in Kansas and would be his last before the United States entered World War II. He intended to undertake another season in southern Kansas, but looming conflict disrupted such plans (W. Wedel to B. Moore, letter, 15 August 1941). A cultural ecologist, Wedel was interested in the interplay of culture and environment (e.g., Taylor 1948:88-89; Wedel 1941, 1953). From 1937 through 1940, however, he investigated sites throughout Kansas with an eye more toward elucidating what cultures were present, as well as their spatial and temporal dimensions, than from an explicitly ecological perspective. The fruits of these investigations were presented in several papers and Wedel's monograph, *An Introduction to Kansas Archeology*. The investigations near Arkansas City laid the groundwork for the taxonomic entity, Lower Walnut focus of the Great Bend aspect, which was cautiously linked to the Wichita tribe (Wedel 1940, 1942, 1959). The *Arkansas City Traveler* headline of August 8, 1940, heralded the work:

Figure 8. Waldo and Mildred Wedel, Arkansas City, 1940. Photo by Richard Slattery.

"Ruins of Ancient Indian Village Are Sought Northeast of City." The item went on to report that "[t]he group is at present camped northeast of the city on the John Goff property and is interesting itself in uncovering the remains of an Indian village which possibly existed about [AD] 1600." Wedel and his field party, consisting of Mildred M. Wedel, Marvin F. Kivett, J. Mett Shippee, Richard "Gates" Slattery, and the cook John Gile, tested three sites: Larcom-Haggard (14CO1), Elliott (14CO2), and the Arkansas City Country Club (14CO3) (Slattery 1995; Wedel 1959). Wedel was assisted by Bert Moore as a guide and John L. Essex, a local teenager who beginning in 1937 and continuing intermittently through 1942 surface collected and occasionally dug in several area sites. Essex directed Wedel's field party to his own limited excavations at the Larcom-Haggard site and even joined the crew, helping to test all three sites (John L. Essex, personal communication 1994, 1995).

The *Traveler* article covered the basics, focusing on the excavations on the T. N. Haggard and A. R. Larcom properties. It noted, "the diggers have unearthed several 'cash' [sic] pits, the storage places of the Indians . . . . Each family had three to four of the pits about their homes."

The cache pits were said to be generally from 4 to 7 feet deep, though this latter depth is not typical of storage pits at Larcom-Haggard or many of the other sites on the valley floor. "The Wedels believe this may have been a village of the Wichita tribe which was encamped on the Arkansas river."

Information on the types of artifacts and varieties of plants and animals used by the natives was also reported. "The Wedels reveal ... there are two or three [mounds] at the Country club, south of the clubhouse. They were about 40 feet across and Dr. Wedel says they should be opened by someone who knows how. But he doesn't think that his group will have the time." In the evenings the artifacts from each day's work were processed—washed, sorted, catalogued, and packed for return to the Smithsonian Institution. Mildred Wedel pieced together broken pots when time permitted (Figure 8).

Under the baleful, whitewashed glare of CHRIST DIED FOR THE UNGODLY, emblazoned on nearby Scripture Hill, the Smithsonian crew excavated "25

Figure 9. Cache pit on the Larcom-Haggard site, 1940. Scripture Hill rises in the background. Photo by Richard Slattery.

to 30 separate features" at the Larcom-Haggard site (Figure 9). Features included 20 or so cache pits and several small midden areas, all clustered on the northwest side of an old meander scar that later became a gravel quarry (Wedel 1959:349). Much less work was done at the Elliott site, east of the river, with a total of eight features excavated in three days. Six features were cache pits, another was a linear trough, and the last was a possible pithouse. This last feature was described as "... a well-defined shallow circular basin 10 feet in diameter ... its floor lay 12 to 18 inches below the general ground surface, with a perceptible dip from the periphery to the center" (Wedel 1959:351).

The Arkansas City Country Club site was the most unusual of the three sites, as numerous well-defined mounds could still be seen dotting the manicured lawn. The mounds included two large, prominent ones located in proximity to one another—these were likely the focus of excavation in the 1890s—and a dozen other low, circular mounds. (John Essex [personal communication 1995] remembered a linear mound, about 18 inches high, 15 feet wide, and approximately 90 feet long, located down slope to the west of the general line of circular mounds. No trace of this feature could be seen during a visit in 1995. While a 1935 aerial photograph of the area, owned by the Kansas Department of Transportation, seems to show a linear feature, the small scale of the photograph precludes an assessment of it.) Wedel's work at the site consisted of the complete excavation of a low mound, located near the Country Club building, beneath which his crew found three refuse-filled cache pits and a shallow basin. The mound appeared to be a midden, built up by continued dumping of trash over the filled-in pits. Although two human skulls were found in two of the pits, the primary function of the pits was, Wedel (1959:353) thought, storage. Despite a utilitarian origin ascribed to the mounds, he did not discount the possibility that some mounds, particularly the larger ones, may have had ceremonial uses (Wedel 1959:572). Hunt and his colleagues may have been on mark, though their "altar" remains problematic.

When the group moved to the Country Club site on the bluffs overlooking the Walnut River, a reporter from the *Arkansas City Tribune* paid a visit. During the course of his interview with Waldo Wedel, he ventured to ask what Wedel hoped to find. "Puebloan sherds" was the reply. In the era before radiometric dating, Puebloan ceramics afforded the possibility of cross-dates for the sites in the valley against sites reliably dated via dendrochronology or tree-ring sequencing. A few such sherds were found, in fact, confirming occupation of the sites in the sixteenth and seventeenth centuries (Wedel 1959:585). At any rate the reporter thought that Wedel, who was chewing on his pipe at the time, said "turds." Confused, but unwilling to ask an eminent archeologist from the Smithsonian Institution for clarification, he instead turned to the more approachable Shippee. Shippee and the crew, however, decided to have a bit of fun and declined to offer any clarification. The field party waited anxiously for the paper to come out to see how the cub reporter was going to handle the issue of "Puebloan turds." The article in the *Tribune*, dated August 22, 1940, failed to make any mention of them at all (John Essex, personal communication 1995).

After Wedel's departure, John Essex continued excavating, sometimes with his father's help, on what is now the Radio Lane site (14CO385). At Wedel's request he drew a map of his excavations in relation to those at the Larcom-Haggard site (Figure 10) (W. Wedel to J. Essex, letter, 8 April 1941; J. Essex to W. Wedel, letter, 13 April 1941). Assisted by his father, he also drew a plan of a portion of the Hall Farm petroglyph site (14CO4) (Wedel 1959:492-493). These records and other information were forwarded

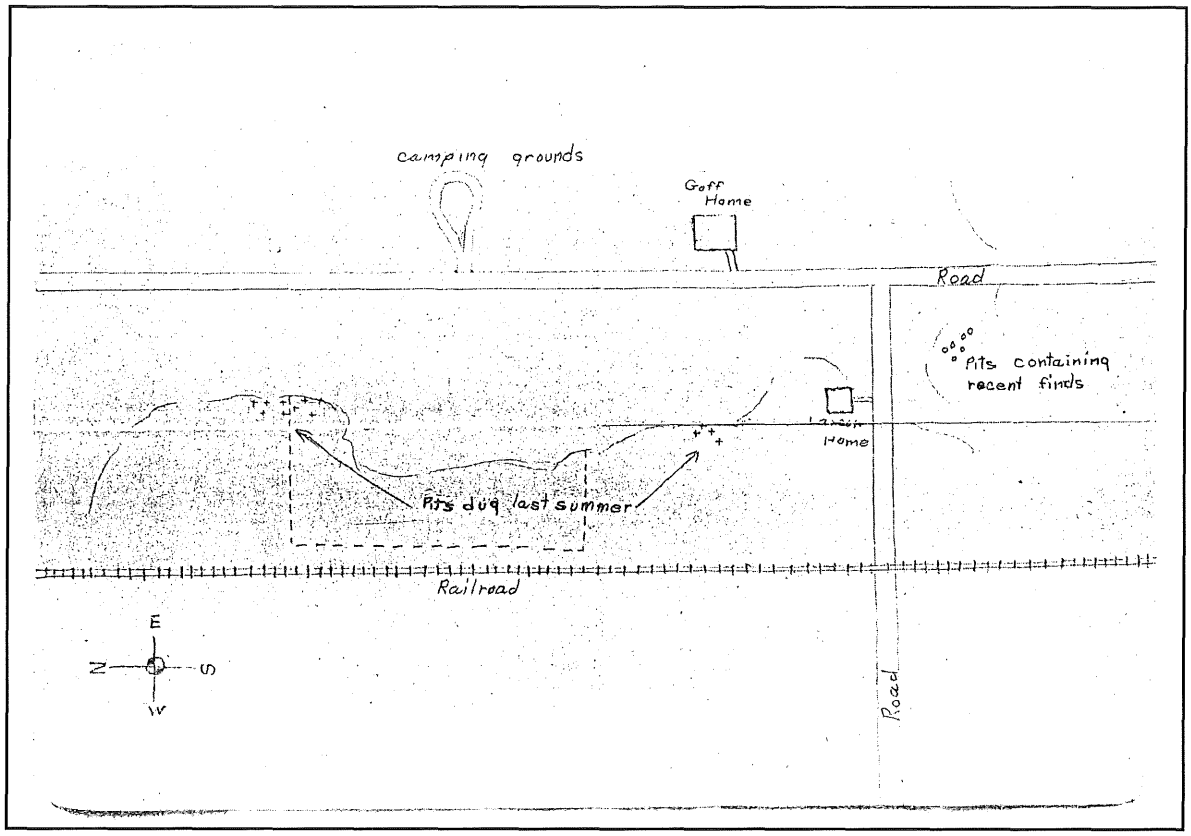

Figure 10. Sketch map of the excavations at the Larcom-Haggard and Radio Lane sites, 1941. Courtesy of the Smithsonian Institution, National Anthropology Archives, Waldo R. Wedel Papers.

to Wedel, as were several vessels—two Cowley Plain and one partial Avery Engraved pot from the Red River valley (Wedel 1959:360).

Conclusions

With the settlement by Americans of the lower Walnut River valley came a gradual awareness that the towns of the valley were situated upon the remains of older villages, campsites, and workshops. As the valley and the adjacent uplands were broken by the plow, streets laid out, and houses and businesses built, artifacts and bones came to light. The work in 1940 by Waldo R. Wedel advanced significantly the understanding of the early history of the valley. Following these efforts, the lower Walnut River valley continued to be the focus of archeological investigations.

O'Bryant (1947) offered brief comments on the sites and reported the find of obsidian flakes, and in the late 1950s Gordon N. Keller, a Wichita State University professor (Keller 1961), analyzed surface collections as well. Edward Salm, an archeologist at Southwestern College in Winfield, conducted excavations at sites on the river south of Winfield in the late 1960s and early 1970s, but this work remains unreported. More recently there have been extensive surveys and excavations in conjunction with either various flood control (e.g., Rohn et al. 1982; Thies 1991a; Thoms and Hill 1979) or highway enhancement projects (e.g., Hawley and Haury 1994; Hawley et al. 1993; Rohn 1994; Thies 1991b; Wulfkuhle 1993).

Archeology, from its very organization to its goals, methods, and theoretical underpinnings, has changed markedly from the 1870s to the present. The stories collected here are reflective of these changes in some degree. Thus, the early archeology is, as Wedel (1959:355) observed, "tantalizingly inadequate." Nonetheless, the early work served in part to guide his investigations in 1940, in particular at the Country Club site. The various accounts hint at the density of the Native American occupation of the valley and the presence of deep storage facilities. The mention of apparently non-local potsherds from the digs in the 1890s (particularly the engraved sherd found by Guinn and the painted sherds found slightly later by Acker and Hunt) points to outside contacts, though this was not explicitly recognized at the time. While there is little mention of botanical remains, animal prey spe-

cies were carefully enumerated. The scattered, generally incomplete nature of the human skeletal remains from sites in the valley suggests the lack of formal cemeteries. Certainly, subsequent investigations have done nothing to alter that view. The work of Martin, Sterling, Parker, and Moore in 1916 left a physical record of a Native American copy of European-contact artifacts (i.e., a gunflint); the limited distribution of such artifacts, at least in the sites on the valley floor, has been verified by more recent salvage work (see Hawley 2000). Ultimately, the stories provide a glimpse of what once was and what has been lost, not only through inherently destructive archeological or quasi-archeological activities, but through the whole settlement process.

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An Annotated Bibliography of Great Bend Aspect–Wichita Archeology and Ethnohistory

Marlin F. Hawley
Wisconsin Historical Society

Donald J. Blakeslee
Wichita State University

The Kansas Anthropologist 24:107-145

Investigations of sites now attributed to the Wichita and related peoples have been conducted for well over a century. In Kansas a major archeological contribution began with the systematic efforts of Waldo R. Wedel in 1934 and was followed by additional investigations of sites in central and south-central Kansas in 1940. The results of Wedel's work were presented in numerous papers and culminated with his important synthesis, An Introduction to Kansas Archeology. *In these works Wedel defined the Great Bend aspect and two foci, cautiously inferentially linking the archeological remains to Coronado's Quivira and, thus, to the Wichita. Mildred M. Wedel meanwhile pursued the Wichita through extant historic Spanish, French, and American documentary sources, the results of which were presented in several elegant, thought-provoking essays. In recent years there has been a renaissance in Great Bend aspect-Wichita studies with renewed excavation, the long overdue study of existing collections, and fresh interpretations of data.*

The following bibliography is comprised of references on Great Bend aspect and Wichita archeology, ethnohistory, history, and other aspects of Wichita culture largely published after 1967, the year that A Pilot Study of Wichita Archeology and Ethnohistory, *edited by Robert E. Bell, Edward B. Jelks, and W. W. Newcomb, came out. Given this cut-off date, the intent in compiling this list was to make it as complete as possible, particularly with respect to archeological and ethnohistoric resources. At the same time, the bibliography has a Kansas focus, and thus some older Kansas-specific items—that is, items predating 1967 and, with one or two exceptions, not cited in the pilot study—have been included here. Numerous cultural resources management (CRM) reports also have been included, with the caveat that there are doubtless more of these that could be added, though admittedly many of these reports (whether included here or not) will have varying degrees of utility for Great Bend-Wichita researchers. Copies of reports for compliance projects in Kansas generally can be obtained for the cost of copying from the State Historic Preservation Office at the Kansas State Historical Society. Finally, while web-based resources exist—*The Handbook of Texas On-line, *for instance—this bibliography is limited to less mutable, conventionally published documents. In the end it is hoped that this document will further the study of the Great Bend aspect and the Wichita.*

A

Adair, Mary J.
1989 Floral Remains. In *Final Summary Report: 1986 Archeological Investigations at 14MN328, A Great Bend Site Along U.S. Highway 56, Marion County, Kansas*, by William B. Lees et al., pp. 90-103. Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

Adair presents an analysis of the floral remains recovered via flotation from the Mem site (14MN328). See Lees et al. 1989.

Anonymous
1959 Untitled. *Newsletter of the Kansas Anthropological Association* 4(9):62-63, Plates I-IV.

Without explanation or preamble this document presents a list of artifacts depicted in four accompanying plates. The artifacts from the Ralph Bell and Robert McReynolds collections are from McPherson County Great Bend sites (Figure 1). For Ralph Bell Collection, see Lindemuth 1990; Roper 2000d.

B

Ball, Russell L., Amy L. Collett, Timothy A. Hauschild, Lisa A. Mertz, and Patricia J. O'Brien
1991 *A Cultural Resource Survey of Lincoln County, Kansas*. Community Service Project, Kansas State University, Manhattan.

This report includes information on a Great Bend camp and petroglyph site.

Barr, Thomas P.
1973 *Highway Archeological Salvage Site Location and Recommendations*. Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

Barr reports on sites, including Great Bend sites, found during highway survey near Marion, Kansas. See Lees et al. 1989; Rohn and Emerson 1984.

Barry, Louise
1972 *The Beginning of the West, Annals of the Kansas Gateway to the American West, 1540-1854*. Kansas State Historical Society, Topeka.

This massive volume documents pre-territorial Kansas history and includes numerous references to the Wichita.

Baugh, Timothy G.
1984 Southern Plains Societies and Eastern Frontier Pueblo Exchange During the Protohistoric Period. In *Collected Papers in Honor of Harry L. Hadlock*, edited by Nancy L. Fox, pp. 157-167. Papers of the Archaeological Society of New Mexico No. 9. Albuquerque.

Although not focused on Great Bend, in this paper on Plains-Pueblo interaction Baugh elaborates his postulated Southern Plains Macroeconomy, a regional exchange system that ultimately would include Great Bend. See Baugh 1991; Baugh and Swenson 1980; Spielmann 1983, 1991b; Vehik 2002a, 2002b; Vehik and Baugh 1994.

1991 Ecology and Exchange: The Dynamics of Plains-Pueblo Interaction. In *Farmers, Hunters, and Colonists*, edited by Katherine A. Spielmann, pp. 107-127. University of Arizona Press, Tucson.

A further consideration of the Southern Plains Macroeconomy, this paper expands the model to include the Great Bend settlements of central and south-central Kansas. See Spielmann 1983, 1991a, 1991b; Vehik 2002a, 2002b; Vehik and Baugh 1994.

Baugh, Timothy G., and Fern E. Swenson
1980 Comparative Trade Ceramics, Evidence for the Southern Plains Macroeconomy. *Bulletin of the Oklahoma Anthropological Society* 29:83-102.

This paper, focused on Puebloan ceramics from Edwards I, proposes a regional exchange system of sedentary and nomadic peoples of the southern Plains and eastern Pueblos termed the Southern Plains Macroeconomy. Great Bend and other Wichita-related manifestations are discussed. See Baugh 1984, 1991; Perttula et al. 2001; Spielmann 1983, 1991a, 1991b; Vehik 2002a, 2002b; Vehik and Baugh 1994.

Bell, Robert E.
1981 Wichita Indians and the French Trade on the Oklahoma Frontier: 1719-1757. *Bulletin of the Oklahoma Anthropological Society* 30:11-17.

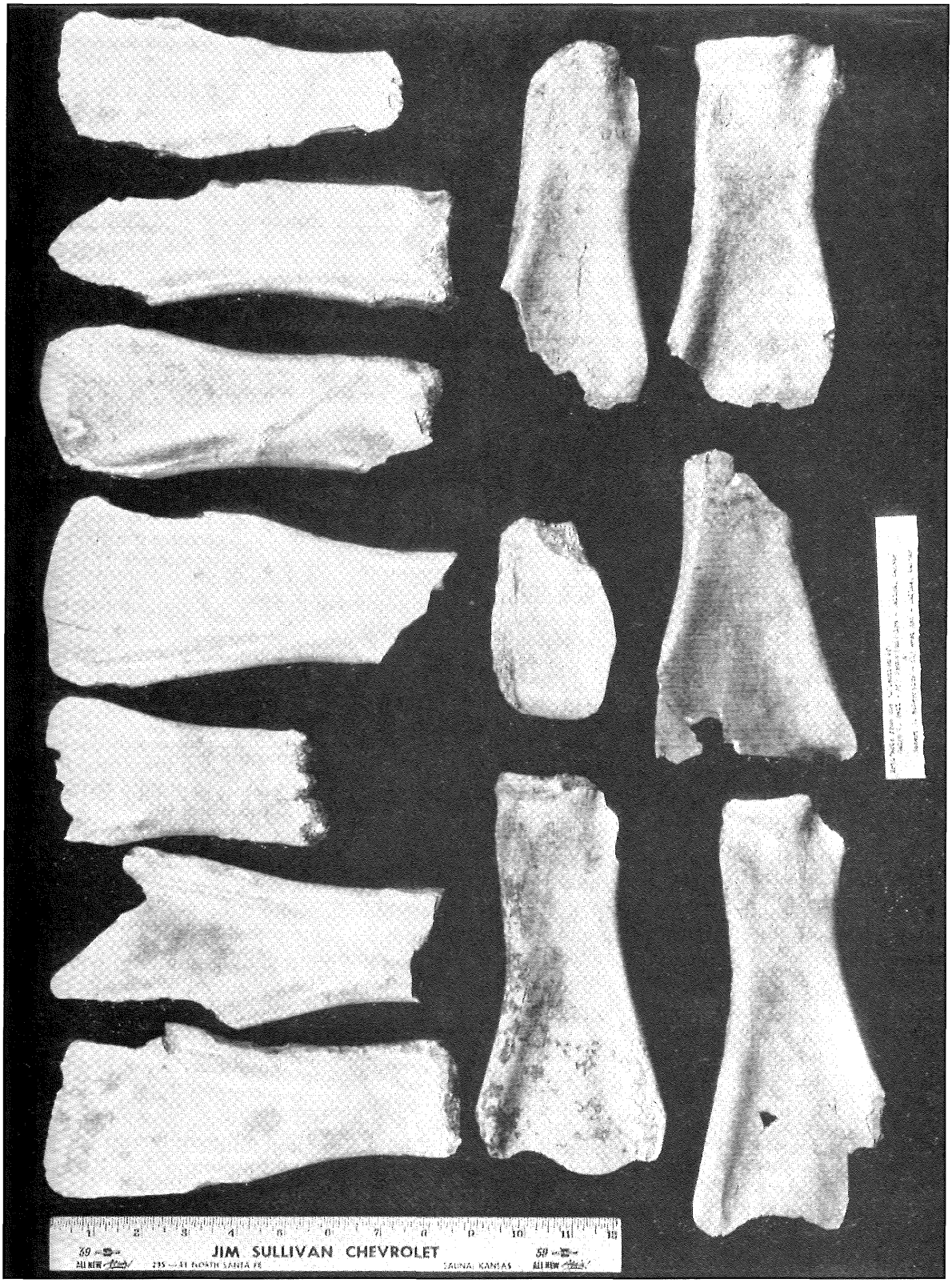

Figure 1. All bone digging tools are from McPherson County site and believed to be scapula of the bison. All were acquired by digging. (Anonymous 1959:Plate I)

Bell discusses Wichita-French trade, mainly from the perspective of the Deer Creek (34Ka3) and Bryson-Paddock (34Ka5) sites on the Arkansas River in north-central Oklahoma.

1983 Reflections on Southern and Central Plains Prehistory. In *Prairie Archaeology: Papers in Honor of David B. Baerreis*, edited by Guy E. Gibbon, pp. 1-13. Publications in Anthropology No. 3. University of Minnesota, Minneapolis.

Although mostly concerned with the earlier Plains Village period and the postulated expansion of the north Caddoans, Bell also offers a few remarks on the Wichita occupations at Deer Creek (34Ka3) and Bryson-Paddock (34Ka5) sites in Oklahoma. For more detailed discussion, see Bell 1982, 1984; Hartley and Miller 1977.

1984 Protohistoric Wichita. In *Prehistory of Oklahoma*, edited by Robert E. Bell, pp. 363-378. Academic Press, New York.

This overview of protohistoric Wichita settlement in Oklahoma includes structures, as well as Wichita material culture.

Bell, Robert E., and Robert L. Brooks
2001 Plains Village Tradition: Southern. In *Plains*, edited by Raymond J. DeMallie, pp. 207-221. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

This is a survey of cultures in the southern Plains in the period ca. A.D. 800-1500. Cultural complexes are reviewed, including several that may be in part ancestral to Great Bend or, in the case of the Henrietta complex, possibly the Kitsai. Great Bend is referred to taxonomically as a "variant."

Bell, Robert E., Edward B. Jelks, and William W. Newcomb (editors)
1967 *A Pilot Study of Wichita Indian Archaeology and Ethnohistory: Final Report.* Submitted to National Science Foundation, Grant No. GS-964. Washington, D.C.

The pilot study reports on archeological survey and test excavations at Wichita or Wichita-related sites in Texas and Oklahoma and includes a lengthy treatment of Wichita ethnohistory with an extensive bibliography. The volume was reprinted in 1974 under the title *Wichita Indians* by Garland, New York.

Bennison, Christopher J., C. Tod Bevitt, and Rolfe D. Mandel
2000 *Phase IV Archeological Investigations at 14CO363: A Late Ceramic Period Campsite in Central Cowley County, Kansas.* Contract Archeology Publication No. 23. Archeology Office, Kansas State Historical Society, Topeka.

This report covers a small Great Bend site located in the Silver Creek valley east of the main body of Lower Walnut sites.

Bevitt, C. Tod, and Scott Brosowske
2004 Looking South—The Plains Village Period in Southern Kansas (and Beyond). In *Kansas Archaeology*, edited by Robert Hoard and Will Banks. University Press of Kansas, Lawrence, in press.

Bevitt and Brosowske present an overview of current understanding of early Plains Village populations in Arkansas River valley, populations that in all likelihood are in some way ancestral to Great Bend. See Blakeslee and Hawley 2004a.

Billings, Melvin O.
1882 Ancient Remains in Marion County, Kansas. *The Kansas City Review of Science and Industry* 6:211-212.

An early Marion resident reports on artifacts and features in Marion County that are now known to be Great Bend. The report hints at the density of settlement in the area.

Blaine, Jay C.
1992 A Summary and Discussion of Additional Findings at the Gilbert Site, an Eighteenth-Century Norteño Occupation in Rains County, Texas. *Bulletin of the Texas Archeological Society* 63:175-196.

This is a review of the Gilbert site (41RA13), a Norteño village. Blaine supports the idea that Norteño is ancestral Kichai (or Kitsai). See Jelks 1967 and Rohrbaugh 1982.

1993 Firearms and Related Artifacts from the Vinson Site. *Bulletin of the Texas Archeological Society* 64:163-186.

Blaine offers an analysis of gun parts from the Vinson site (41LT1), a Norteño focus site in central Texas. See Smith et al. 1993.

Blaine, Martha Royce

1982 The Pawnee-Wichita Visitation Cycle: Historic Manifestations of an Ancient Friendship. In *Pathways to Plains Prehistory, Anthropological Perspectives on Plains Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 113-134. Oklahoma Anthropological Society Memoir No. 3 and Cross Timbers Heritage Association Contributions No. 1. Duncan, Oklahoma.

Blaine documents the close relationship between the Wichita and Pawnee that has existed for many centuries and persists to the present day. See Roper 2000a.

Blakeslee, Donald J.

1997 The Marine Shell Artifacts of Kansas. *Central Plains Archeology* 5:3-10.

This paper documents the reported specimens of marine shell from sites in Kansas, including those found on Great Bend sites. See Hawley 2000; Wedel 1959.

Blakeslee, Donald J., and Marlin F. Hawley

2004a The Great Bend Aspect. In *Kansas Archaeology*, edited by Robert Hoard and Will Banks. University Press of Kansas, Lawrence, in press.

Blakeslee and Hawley provide an overview of the current understanding of Great Bend, though without proposing a taxonomic revision.

2004b Improving the Focus: A Revision of Great Bend Systematics. In *The Great Divide: The Protohistoric Period on the Southern Plains*, edited by Donald J. Blakeslee. University of Alabama Press, Tuscaloosa, in press.

As the title suggests, this paper offers a full-scale revision of the Great Bend aspect and its foci.

Blakeslee, Donald J., and Arthur H. Rohn

1986 *Man and Environment in Northeastern Kansas: The Hillsdale Lake Project*. Department of Anthropology, Wichita State University, Wichita, Kansas. Submitted to U.S. Army Corps of Engineers, Kansas City District.

This contract report includes the first documentation of Great Bend hunting camps in eastern Kansas. They are marked by distinctive pottery and by the presence of Peoria (or Tahlequah) chert. The report also includes the creation of the named tool type, Marion blades. See Feagins 1996; Howard 1964.

Boszhardt, Robert F.

2000 Turquoise, Rasps, and Heartlines: The Oneota Bison Pull. In *Mounds, Modoc, and Mesoamerica, Papers in Honor of Melvin L. Fowler*, edited by Steven R. Ahler, pp. 361-374. Illinois State Museum Scientific Papers No. 28. Springfield, Illinois.

Although this paper focuses on the LaCrosse, Wisconsin-area Oneota sites, dated A.D. 1300-1650, Boszhardt posits the Great Bend aspect as a central link in a trans-Plains exchange network involving the Oneota.

Bozarth, Steven

1989 Phytoliths. In *Final Summary Report: 1986 Archeological Investigations at 14MN328, A Great Bend Site Along U.S. Highway 56, Marion County, Kansas*, by William B. Lees et al., pp. 90-103. Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This report identifies the maize and bean phytoliths from the Mem site (14MN328). Grass phytoliths also indicated that some pits had once been lined with tall grass.

1990 Diagnostic Opal Phytoliths from Pods of Selected Varieties of Common Beans (*Phaseolus vulgaris*). *American Antiquity* 55(1):98-104.

This short paper reports on the presence of bean phytoliths in feature fill from the Mem site (14MN328).

1993 Maize (*Zea mays*) Cob Phytoliths from a Central Kansas Great Bend Aspect Archaeological Site. *Plains Anthropologist* 38(146):279-286.

This paper reviews the recovery and identification of maize cob phytoliths from the Mem site (14MN328).

Brechtel, James M.

1993 *Cultural Resources Inventory Report for*

William Natural Gas Company, Blackwell-Grabham 26" & 20", Grabham-Welda 30", and Welda-Ottawa 20" & 30" Pipelines. J. M. Brechtel, Fort Collins, Colorado. Submitted to Williams Natural Gas Company, Tulsa, Oklahoma.

This contract report contains information on 14CT101, a putative Great Bend site in southeast Kansas.

Brogan, William T.

1981a *Phase II Archeological Field Survey Investigation of the Little River Wastewater Treatment Facility, Rice County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Bachenberg and Holcomb Associates, Hutchinson, Kansas.

This contract report describes Great Bend site 14RC308 and provides information on other Great Bend sites in the same area.

1981b *Phase III Archeological Field Investigations at Site 14RC410: Little River Wastewater Treatment Facility, Little River, Rice County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Bachenberg and Holcomb Associates, Hutchinson, Kansas.

This contract report contains information on limited testing at 14RC410, a Great Bend campsite.

Brogan, William T., and John D. Reynolds

1982a Kansas Archeology Training Program: Experimental Archeology, Construction of a Grass Lodge. *Journal of the Kansas Anthropological Association* 3(2&3):27-50.

1982b Kansas Archeology Training Program: Experimental Archeology, Replication of a Grass Lodge Pithouse. *Journal of the Kansas Anthropological Association* 4(1, 2, & 3).

Brogan and Reynolds discuss the experimental reconstruction of Wichita grass houses. The papers are important for details of house construction, drawn both from ethnographic accounts and hands-on experience. They offer inferences on necessary materials and tools, including the "grassing needle" (Figure 2).

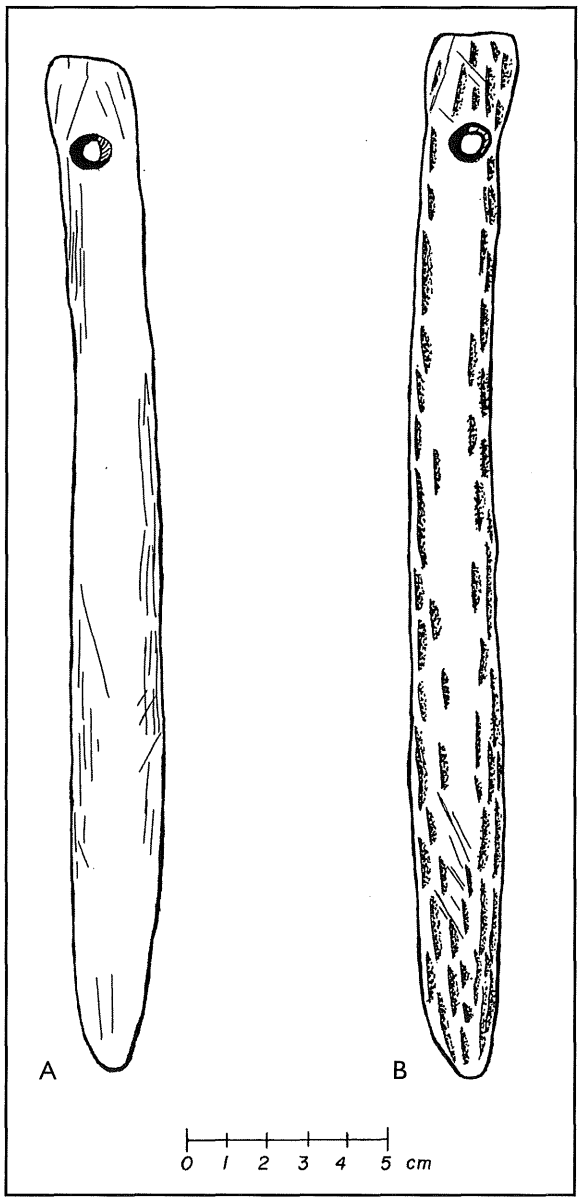

Figure 2. Grassing needle utilized during 1981 lodge replication. a) dorsal surface, b) ventral (cancellous) surface. (Brogan and Reynolds 1982a:42, Figure 1)

Brooks, Robert L.

1989 Village Farming Societies. In *From Clovis to Comanchero: Archeological Overview of the Southern Great Plains*, by Jack L. Hofman, Robert L. Brooks, Joe S. Hays, Douglas W. Owsley, Richard L. Jantz, Murray K. Marks, and Mary H. Manhein, pp. 71-90. Arkansas Archeological Survey Research Series No. 35. Submitted to U.S. Army Corps of Engineers, Southwestern Division.

This review of southern Plains village cultural complexes includes comments on the Pratt complex. See Ranney 1994 and Wedel 1959 for more on the Pratt complex.

Brooks, Robert L., and Robert Bell
1989 The Last Prehistoric People: The Southern Plains Villagers. *The Chronicles of Oklahoma* 67(3):296-319.

This is a non-technical survey of Southern Plains village cultural complexes, including Great Bend, which was informally designated as a "variant." For a more recent summary, see Bell and Brooks 2001.

Brower, Jacob V.
1898 *Quivira.* Memoirs of Exploration in the Basin of the Mississippi, vol. 1. H. L. Collins, St. Paul, Minnesota.

1899 *Harahey.* Memoirs of Explorations in the Basin of the Mississippi, vol. 2. H. L. Collins, St. Paul.

1903 *Kansas.* Memoirs of Explorations in the Basin of the Mississippi, vol. 7. H. L. Collins, St. Paul.

Jacob Brower, associated with the Minnesota Historical Society, makes his case in these monographs for the location of Quivira in the Kansas River valley near Junction City, Kansas. Although his thesis has been rejected, these do summarize early knowledge about the Wichita in Kansas. See Judge 1982; Richey 1900.

Brown, Kenneth L., and Alan H. Simmons (editors)
1987 *Kansas Prehistoric Archeological Preservation Plan.* Office of Archaeological Research, Museum of Anthropology and Center for Public Affairs, University of Kansas, Lawrence.

The authors present overviews, with extensive references, on all Native American cultural complexes identified (at the time it was compiled) in Kansas. Included are discussions of both Lower Walnut and Little River, as well potential antecedent cultures, such as the Pratt complex. See Lees, Reynolds, and Ridgeway 1989.

Butler, Susan E.
1997 Heat Treatment and Intended Tool Function as Seen from Sharps Creek. *The Kansas Anthropologist* 18(1):21-26.

Butler tests the hypothesis that Little River focus peoples preferentially thermally altered tools depending on the intended use of those tools.

Butler, William B., and J. J. Hoffman (assemblers)
1992 A Checklist of Plains Ceramic Types and Wares. *South Dakota Archaeology* 16:1-105.

As the title suggests, this is a compendium of Plains ceramic wares and types, including those of the Great Bend aspect and related cultures. The paper concludes with an extensive bibliography.

C

Cacioppo, Samuel T., and Arthur H. Rohn
1981 *Cultural Resource Monitoring of Inspection Trench at Larned, Kansas and Defining Surface and Subsurface Limits of Site 14PA306 (formerly designated 14PA308).* Archaeology Laboratory, Wichita State University, Wichita, Kansas. Submitted to U.S. Army Corps of Engineers, Albuquerque District.

This contract report describes efforts to define limits of Great Bend aspect site 14PA306 near Larned. The site lies in proximity to the Lewis site (14PA307).

Connelley, William Elsey
1918 Notes on the Early Indian Occupancy of the Great Plains. *Kansas Historical Collections, 1915-1918* 14:438-470.

Connelley discusses Native American populations on the Great Plains, especially in Kansas, and offers comments on the Wichita. He places Quivira north of the confluence of the Arkansas and Little Arkansas rivers.

1931 Archaeological Activities. In *Twenty-Seventh Biennial Report of the Board of Directors, Kansas State Historical Society*, pp. 29-30. Topeka.

This short note concerning investigation by Horace and Paul Jones of sites in Rice County discusses Frederick Webb Hodge's visit and comments on the sites.

Conrad, Mary
1993 June Excavations at Sharps Creek Site near Lindsborg, Kansas. *Kansas Anthropological Association Newsletter* 5(5):3-6.

This is a short review of the 1993 Kansas Archeology

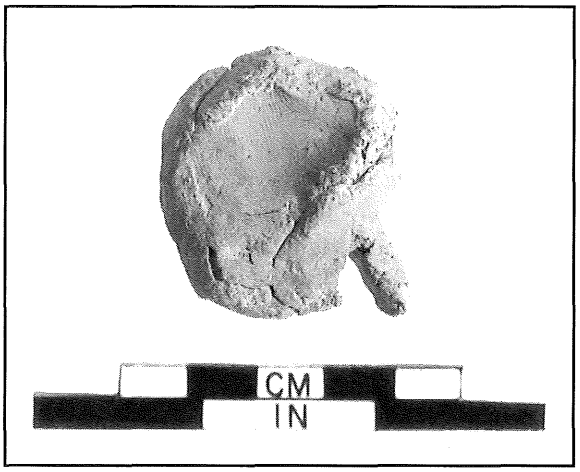

Figure 3. This unfired lump of clay bears the prehistoric potter's fingerprints. (Conrad 1993:5)

Training Program field school at the Sharps Creek site (14MP408) (Figure 3).

Cooper, Laverne Megee
1975 A Study of Kay County Chert: Prehistoric Quarrying, Typology and Utilization Trends. *Bulletin of the Oklahoma Anthropological Society* 23:185-192.

In this study on distribution of Kay County (Florence A) chert and quarries in southern Flint Hills, Cooper appears to combine two reports by Charles Gould, one on the Country Club site (14CO3) and the other on the Maple City quarries (14CO5) in southeast Kansas. See Vehik 1985, 1986, 1990; Wedel 1959.

Corbyn, Ronald C.
1976 *Archeological Photointerpretation of the Deer Creek Site, Kay County, Oklahoma.* Unpublished Master's research paper, Department of Anthropology, Pennsylvania State University, University Park.

The author presents an application of photointerpretation to the Deer Creek site (34Ka46), arguing that use of such methods is necessary to the planning of archeological investigations. There is extensive discussion of various mounds, depressions, and ditches defined through photointerpretation. Similar features are argued to be present at Bryson-Paddock (34Ka5).

Craine, Eugene
1955 Comments by Vernon Drake. *Newsletter of the Kansas Anthropological Association* 1(2):3-4.

Brief comments are offered concerning successful surface hunting of artifacts at the Saxman site (14RC301) in central Kansas, including several types of drills, other stone tools, redstone pipes, and large metates.

D

Dorsey, George A.
1904 *The Mythology of the Wichita.* Carnegie Institution of Washington, Washington, D.C.

Dorsey's book, reprinted by the University of Oklahoma Press in 1995, presents translations of numerous Wichita myths. The introductory section summarizes late-nineteenth-century Wichita culture.

Drass, Richard R.
1998 The Southern Plains Villagers. In *Archaeology on the Great Plains*, edited by W. Raymond Wood, pp. 415-455. University Press of Kansas, Lawrence.

This recent overview of southern Plains village cultures includes discussion of the Bluff Creek and Pratt complexes—possibly antecedent cultures—and the Great Bend aspect. The Henrietta complex is also discussed; it has been speculated that it, too, represents an ancestral Wichita population.

E

Eddy, John A.
1978 Archaeoastronomy of North America: Cliffs, Mounds, and Medicine Wheels. In *In Search of Ancient Astronomies*, edited by E. C. Krupp, pp. 133-163. McGraw-Hill Book Company, New York.

While the essay ranges widely over North America, Eddy does offer criticism of Wedel's hypothesis that the council circles of central Kansas may have been solstice markers. See Wedel 1967, 1977, 1990.

Eggan, Fred, and Joseph A. Maxwell
2001 Kinship and Social Organization. In *Plains*, edited by Raymond J. DeMallie, pp. 974-982. *Handbook of North American Indians*, vol. 13, pt. II, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

The section of this paper entitled "Prairie Plains" offers general comments on Wichita, Kitsai, and Pawnee kinship. See Lesser 1979.

Elam, Earl H.

1971a *The History of the Wichita Confederacy to 1868*. Unpublished Ph.D. dissertation, Texas Tech University, Lubbock.

1971b The Origin and Identity of the Wichita. *Kansas Quarterly* 3(4):13-20.

This short paper summarizes Wichita history from 1541 into the early twentieth century. See Newcomb 2001; Vehik 1992; M. Wedel 1988.

Emerson, Alice M.

1977 *Evidence for Floodplain Settlement in the Great Bend Aspect of Marion, Kansas*. Unpublished Master's thesis, Department of Anthropology, Wichita State University, Wichita, Kansas.

This thesis examines both upland and floodplain villages in the vicinity of Marion and concludes that they were functionally equivalent. See also Roper 2002.

F

Feagins, Jim D.

1996 The Bourbon Complex: A Late Prehistoric Plains Caddoan Subsistence Strategy Near the Kansas-Missouri Border. [Abstract]. *Program and Abstracts of the 54th Annual Plains Anthropological Conference*, Iowa City, Iowa.

Feagins reviews the data on short-term hunting-extraction sites in eastern Kansas. The evidence points to a connection with Great Bend. See Blakeslee and Rohn 1986; Howard 1964.

Flint, Richard

2002 *Great Cruelties Have Been Reported, the 1544 Investigation of the Coronado Expedition*. Southern Methodist University Press, Dallas.

Flint presents translations of Spanish documents from the official inquest into the Coronado expedition and its effects on Native American societies. Sprinkled among the reports are comments on the Wichita and other groups.

Flores, Dan L. (editor)

1985 *Journal of an Indian Trader, Anthony Glass and Texas Trading Frontier, 1790-1810*. Texas A&M University Press, College Station.

Flores presents the full journal of Anthony Glass, a trader who visited several Wichita villages on the Red River in the late-eighteenth and early-nineteenth centuries. For an excerpt of the journal, see John 1982.

G

Gagné, F. R., Jr.

1998 *Proposed Augusta Waste Treatment Plant, An Archaeological Investigation for the City of Augusta, Kansas, Surveyed October 24th and 25th of 1998*. Archaeology Laboratory, Wichita State University, Wichita, Kansas.

This reports a cultural resources survey of Great Bend sites near Augusta, Kansas in the upper Walnut River valley. See Keller 1961.

1999 *Proposed Augusta Waste Treatment Plant, Step II Archaeological Investigation for the City of Augusta, Kansas*. Archaeology Laboratory, Wichita State University, Wichita, Kansas.

This report on testing activities of a Great Bend site near Augusta (14BU387) has largely negative results.

Gerow, Jean

1989 Terrestrial Treasure. *Dialog* 13(1):8-11. Tulsa, Oklahoma.

This is a non-technical photoessay on Lasley Vore site (34Tu65) in Oklahoma. See Odell 2002.

Gould, Charles N.

1898a Prehistoric Mounds in Cowley County. *Transactions of the Kansas Academy of Science* 15:79-80.

This early report on excavations at the Arkansas City Country Club site (14CO3) includes brief description of artifacts and other materials found in subterranean storage pits.

1898b The Timbered Mounds of the Kaw Reservation. *Transactions of the Kansas Academy of Science* 15:78-79.

1899 Additional Notes on the Timbered Mounds

of the Kaw Reservation. *Transactions of the Kansas Academy of Science* 16:282.

Gould, later a noted geologist, was the first to report on the so-called "Timbered Mounds," actually aboriginal quarries near Maple City, Kansas. The paper was the first to link the quarries to the Lower Walnut sites near Arkansas City, though earlier populations also exploited the stone. See Vehik 1985, 1988; Wedel 1959.

Grosser, Roger D.
1993 *Kanopolis Lake, Kansas Historic Properties Management Plan.* U.S. Army Corps of Engineers, Kansas City District.

The management plan includes information on Great Bend sites, especially petroglyph sites, in the Kanopolis Basin. See O'Neill 1980, 1981; Smith 1949; Wedel 1959.

Gunnerson, James H.
1987 *Archaeology of the High Plains.* Cultural Resources Series No. 19. Bureau of Land Management, Denver.

Gunnerson reviews Great Bend aspect archeology, specifically the literature on council circles, domestic structures, and material culture. The summary leans heavily on the writings of Waldo Wedel and Earl Monger. For other reviews, see Bell and Brooks 2001; Brown and Simmons (editors) 1987; Hofman 1989.

Gunnerson, James H., and Dolores A. Gunnerson
1988 *Ethnohistory of the High Plains.* Cultural Resource Series No. 26. Bureau of Land Management, Denver.

The Gunnersons provide an overview of the ethnohistory of several tribes, including the Wichita. See Newcomb 2001; various papers by M. Wedel (collected in M. Wedel 1988).

H

Hamel, Dean
1959 Cultures and Culture Traits in Kansas Archaeology: Smokey [sic] Hill-Great Bend Aspect. *Kansas Anthropological Association Newsletter* 4(6):48-50.

Compiled in outline form, Hamel offers a list of traits for the Great Bend aspect, which is still referred to by Wedel's 1935 designation.

Hartley, John D.
1975 The Bryson Site: Ka-5. In *Kaw Reservoir-The Northern Section, North-Central Oklahoma*, edited by John D. Hartley, pp. 5-78. Oklahoma River Basin Survey Archaeological Site Report No. 30. University of Oklahoma, Norman.

This report describes test excavations in a midden and storage pit at the Bryson site (34Ka5), an eighteenth-century Wichita village on the Arkansas River in north-central Oklahoma. Hartley and Miller 1977 present much additional data.

Hartley, J. D., and A. F. Miller
1977 *Archaeological Investigations at the Bryson-Paddock Site, an Early Contact Period Site on the Southern Plains.* Oklahoma River Basin Survey Archaeological Site Report No. 32. University of Oklahoma, Norman.

In this report on excavations at the eighteenth-century Wichita site (34Ka5) in northern Oklahoma, the authors report on the discovery of three structures, numerous trash-filled pits, and both traditional and native tools and European trade goods. They also report two radiocarbon assays. See Bell 1981, 1983; Sudbury 1976a.

Hawley, Marlin F.
1994 Arkansas City Bypass Investigations: An Update. *Kansas Anthropological Association Newsletter* 6(5):5-6.

This note reports results of investigation at the Killdeer site (14CO501), where over 40 features were excavated.

1997 *A Report on Construction-Related Damages at 14CO382, Arkansas City, Kansas.* Submitted to Wichita and Affiliated Tribes, Anadarko, Oklahoma.

Hawley briefly reports on the investigation into the severity and extent of damage caused by borrow activity to Lower Walnut and earlier cultural deposits (including a feature in which human remains had been recovered) at site 14CO382 near Arkansas City.

2000 European-Contact and Southwestern Artifacts in the Lower Walnut Focus Sites at Arkansas City, Kansas. *Plains Anthropologist* 45(173):237-255.

A review of selected artifacts includes the European trade goods, Puebloan pottery, *Olivella* and *Conus* shell, obsidian, and cultural turquoise found during highway salvage investigations in Lower Walnut sites. It is suggested (following Vehik 2002) that these items were used to enhance the prestige of chiefs.

2002 "More's the Pity": The Short Archeological Career of J. A. Udden. *The Kansas Anthropologist* 23:23-34.

This paper reviews Udden's pioneering excavations at the Paint Creek site (14MP1) and the resultant 1900 monograph, *An Old Indian Village*.

2003 Early Investigations of Archeological Sites in the Lower Walnut River Valley. *The Kansas Anthropologist* 24:87-106.

Using stories from local newspapers and other primary documents, together with unpublished materials, this paper reviews the early investigations in the lower Walnut River valley of Kansas from ca. 1870s to Waldo R. Wedel's Smithsonian Institution excavations in 1940.

Hawley, Marlin F., and Cherie E. Haury
1994 Lower Walnut Great Bend: Investigations of Sites Near Arkansas City, Kansas, Background and Results. *The Kansas Anthropologist* 15(1):1-45.

This is a summary article on the test excavations conducted at the Radio Lane site (14CO385) and other Lower Walnut sites near Arkansas City.

Hawley, Marlin F., and Susan Holland
1996 Status Report on Archeological Field Work at Arkansas City. *Kansas Anthropological Association Newsletter* 8(1):7-11.

Brief update on Arkansas City highway project mitigation work at the Radio Lane site (14CO385).

Hawley, Marlin F., and Timothy Weston
1994 Research Design and Mitigation Plan for the Radio Lane Site (14CO385). *Kansas Anthropological Association Newsletter* 6(2):13-14.

This article briefly states the research goals for the upcoming Kansas Archeology Training Program to be held at the Radio Lane site (14CO385), although the Arkansas City field school was ultimately changed to the Killdeer site (14CO501).

Hawley, Marlin F., and Virginia A. Wulfkuhle
1994 KATP's Twentieth Season Spent in Arkansas City. *Kansas Preservation* 16(5):1-4.

An overview is presented of the 1994 Kansas Archeology Training Program field school at the Killdeer site (14CO501), a site affected by levee and highway construction activities.

Hawley, Marlin, Timothy Weston, Rolfe D. Mandel, Christopher M. Schoen, Sheryll White, Barry G. Williams, and Virginia A. Wulfkuhle
1993 *Cultural Resources Investigations for the U.S. Highway 166 Corridor: Results of Phase II Archeological Survey and Geomorphological Study in Cowley and Chatauqua Counties, Kansas.* Contract Archeology Publication No. 11. Archeology Office, Kansas State Historical Society, Topeka.

In this survey report, several additional Lower Walnut sites near Arkansas City, Kansas, are reported. See also Wulfkuhle 1993 for a report on testing at the Country Club site (14CO3) and Hawley et al. 1994 for a test report on some of the sites.

Hawley, Marlin F., Rolfe D. Mandel, Cherie E. Haury, Marsha King, and John D. Reynolds
1994 *Archeological and Geomorphological Investigations of Sites in the Vicinity of Arkansas City, Cowley County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report presents the results of test excavations, primarily at the Radio Lane (14CO385) and Larcom-Haggard (14CO1) sites, in the lower Walnut River valley. See Hawley and Haury 1994; Rohn 1994.

Hays, Joe S., Robert L. Brooks, and Jack L. Hofman
1989 Historical Archeology in the Southern Great Plains. In *From Clovis to Comanchero: Archeological Overview of the Southern Great Plains*, by Jack L. Hofman, Robert L. Brooks, Joe S. Hays, Douglas W. Owsley, Richard L. Jantz, Murray K. Marks, and Mary H. Manhein, pp. 101-110. Research Series No. 35. Arkansas Archeological Survey, Fayetteville. Submitted to U.S. Army Corps of Engineers, Southwestern Division.

This includes a brief discussion of historic Wichita

sites, such as the Lasley Vore (34Tu65) and Longest (34Jf1) sites in Oklahoma. For more on these sites, see Bell, Jelks, and Newcomb 1967 and John 1992 (for Longest) and various papers by Odell (for Lasley Vore).

Hickerson, Nancy Parrott
1994 *The Jumanos, Hunters and Traders of the South Plains.* University of Texas Press, Austin.

Hickerson investigates the Jumanos mentioned in early Spanish accounts of the Plains and concludes that, rather than being a catch-all term, they in fact were a distinct people whom she connects to the settlements of Quivira. See Newcomb 2001.

Hill, David V., and Donald J. Blakeslee
1983 *Archaeological Assessment of Some Great Bend Aspect Sites in Cowley County, Kansas.* Department of Anthropology, Wichita State University, Wichita, Kansas. Submitted to Northwest Central Pipeline, Inc.

This contract report presents data on non-ceramic Lower Walnut sites.

Hodge, F. W.
1900 Review of *An Old Indian Village* by John [sic] August Udden. *American Anthropologist* 2(4):749-751.

In this review of Johan Udden's monograph on the Paint Creek site (14MP1), Hodge attributes the chain mail to the failed Bonilla and Humaña expedition of 1593-1594, rather than the 1540-1541 Coronado entrada.

Hofman, Jack L.
1989 Protohistoric Culture History on the Southern Great Plains. In *From Clovis to Comanchero: Archeological Overview of the Southern Great Plains*, by Jack L. Hofman, Robert L. Brooks, Joe S. Hays, Douglas W. Owsley, Richard L. Jantz, Murray K. Marks, and Mary H. Manhein, pp. 91-100. Research Series No. 35. Arkansas Archeological Survey, Fayetteville. Submitted to U.S. Army Corps of Engineers, Southwestern Division.

Hofman provides an overview of Great Bend, the protohistoric Wichita, as well as potentially related complexes in the central and southern Plains. The volume has an extensive bibliography. For other reviews, see Brooks 2001; Brown and Simmons (editors) 1987; Gunnerson 1987.

Holland, Susan A.
1998 Evidence of the Spring Planting Ceremony to Evening Star and Her Sacred Garden. *Plains Anthropologist* 43(166):411-419.

Holland interprets a scratched design on a bison scapula hoe from the Lower Walnut Killdeer site (14CO501) excavations in Arkansas City, concluding that it is related to the spring planting ceremony.

Horr, David, and Alfred Johnson
1957 Petroglyphs of Central Kansas. Ms. on file, Kansas State Historical Society, Topeka.

Report contains drawings of numerous petroglyphs in central Kansas, many attributed to Great Bend peoples. See O'Neill 1980, 1981; Wedel 1959.

Howard, James H.
1964 *Archeological Investigations in the Toronto Reservoir Area, Kansas.* River Basin Survey Papers No. 38. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

In this report Howard presents data on eastern Kansas Great Bend hunting camps. Two sites contain petroglyphs that Howard, based on motifs, associated with Great Bend. See Feagins 1996; Rohn and Blakeslee 1987.

Hughes, Richard E., and William B. Lees
1991 Provenance Analysis of Obsidian from Two Late Prehistoric Archaeological Sites in Kansas. *Transactions of the Kansas Academy of Science* 40:297-307.

Obsidian from the Mem site (14MN328) near Marion and the Booth site (14CM406) is sourced using x-ray fluorescence. The material was found to come from flows in the Jemez Mountains of New Mexico.

I

Isely, Bliss
1933 The Grass Wigwam at Wichita. *Kansas Historical Quarterly* 2(1):66-71.

Isely recounts the story of the construction of a grass

lodge in a Wichita, Kansas, park in 1927 by a group of Wichita Indian women. A picture of the lodge appears in Isely's school text, *Early Days in Kansas*.

J

Jelks, Edward B.

1967 The Gilbert Site: A Norteño Focus Site in Northeastern Texas. *Bulletin of the Texas Archeological Society* 37:1-248.

This is a major report on a Norteño focus site (14RA13) in Texas. The complex is often regarded as ancestral to the Kichai (or Kitsai).

John, Elizabeth A. H.

1975 *Storms Brewed in Other Men's Worlds*. University of Oklahoma Press, Norman.

This is an encyclopedic history of the interaction of the Comanches with all of their neighbors, mostly with the Spanish in New Mexico and Texas, but also with the Wichitas.

1982 Portrait of a Wichita Village, 1808. *The Chronicles of Oklahoma* 60(4):412-437.

John presents an extract from the journal of Anthony Glass, a trader dispatched on a diplomatic mission to a large Wichita village on the Red River. The journal offers vivid glimpses of Wichita life in the early nineteenth century. For complete journal, see Flores (editor) 1985.

1992 A Case Study in the Interdependence of Archeology and History: The Spanish Fort Sites on the Red River. *Bulletin of the Texas Archeological Society* 63:197-210.

John reviews the ethnohistory of the substantial cluster of still largely uninvestigated historic Wichita sites that straddle the Red River in Oklahoma and Texas.

Johnson, C. P.

1897 Mound in Cowley County, Kansas. *The Antiquarian* 1:95-96.

This article briefly describes an excavation undertaken in low mounds on what is now the Arkansas City Club site (14CO3). See Gould 1897; Wedel 1959.

Jones, Bruce

1975 Puebloan Pottery Sherds from the Major Site 14RC2. *Kansas Anthropological Association Newsletter* 21(4):10-11.

This short paper reports identification of three seventeenth-century Puebloan sherds from the Major site (14RC2) in central Kasnas. See Hawley 2000; Rucker 1971; Thies 1987; Wedel 1982.

1977 *Archeological Investigations in the Upper Little Arkansas Watershed, Ellsworth, Rice, McPherson, Reno, and Harvey Counties, Kansas*. Archeology Office, Kansas State Historical Society, Topeka. Submitted to U.S. Army Corps of Engineers, Tulsa District.

Contract report with information on several previously unreported Great Bend sites.

Jones, Horace

1928 Quivira—Rice County, Kansas. *Kansas Historical Collections 1926-1928* 17:535-546.

An account of the investigations undertaken by Lyons, Kansas, newspaper men Paul and Horace Jones in Rice County sites, which they argue to be the location of Coronado's Quivira. See P. Jones 1929, 1937; Ross 1928; Zimmerman and Parks 1931.

1973 *Up from the Sod—the Life Story of a Kansas Prairie County*, 2nd edition. Rice County Historical Society, Lyons, Kansas.

Jones offers a conventional treatment of the Coronado entrada into central Kansas and the Wichita occupation of what later became Rice County, Kansas. The book contains numerous photographs of artifacts along with a few taken during Wedel's excavations in the 1960s.

Jones, Paul A.

1929 *Quivira*. 2nd ed. McCormick-Armstrong Company, Wichita, Kansas.

1937 *Coronado and Quivira*. Lyons Publishing, Lyons, Kansas.

Following the discovery of a pottery vessel in a field in Rice County, the Jones brothers conducted surveys and excavations. These volumes present the findings, set within the context of the Coronado entrada of 1541. The reprint, *Coronado and Quivira*, is substantially the same except that there is additional material on Coronado supplied by Mexican historians. Also, a

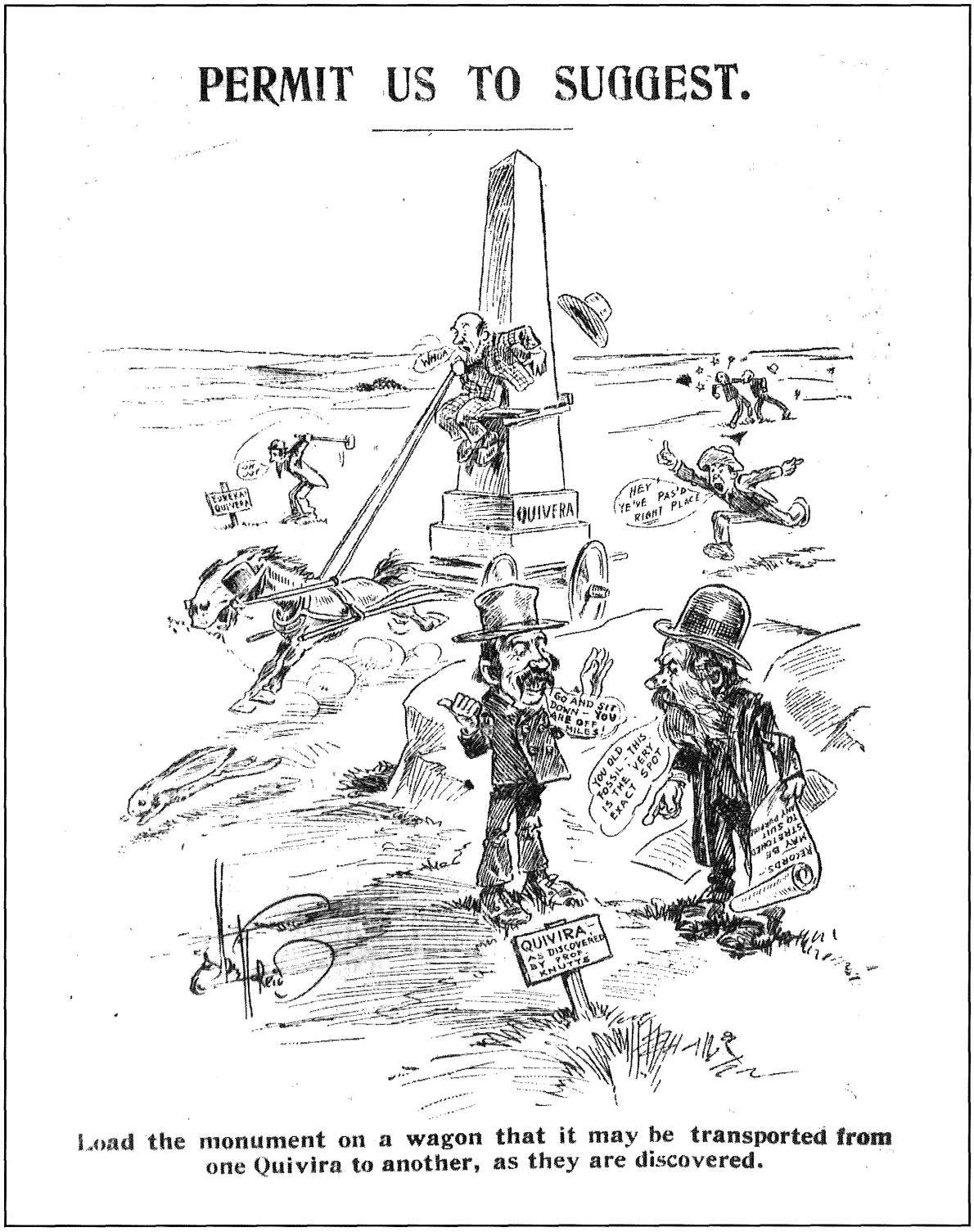

Figure 4. A cartoon by Albert T. Reid was published in an August 1902 issue of *Topeka Mail and Breeze* regarding the Brower and Richey controversy. (Judge 1982:197)

chapter in the earlier work regarding Prince Madoc and alleged Welsh penetration of the Great Plains prior to Columbus was dropped. See H. Jones 1928; Wedel 1942, 1959, 1990.

Judge, Sara

1982 Brower, Richey, and the Quivira Controversy. *Journal of the Kansas Anthropological Association* 3(6&7):187-200.

Judge reviews the controversy involving Jacob Brower and William Richey over the location of Quivira as they interpreted it based on archeology and historic documents. Both men placed Quivira in the Kansas River valley near modern-day Junction City (Figure 4).

K

Keller, Gordon N.

1961 *The Changing Position of the Southern Plains in the Late Prehistory of the Great Plains Area.* Unpublished Ph. D. dissertation, Department of Anthropology, University of Chicago.

Keller's dissertation is an important and often neglected discussion of Great Bend with much data on culture content and settlement. Keller proposed a revision of bipartite Great Bend taxonomy by proposing a third foci, the Ninnescah focus. Keller tested numerous south-central Kansas sites with Great Bend occupations, though he presents little of the actual data here.

Kivett, Marvin F.

1947 *Preliminary Appraisal of the Archeological and Paleontological Resources of Kanopolis Reservoir, Ellsworth County, Kansas.* Smithsonian Institution, River Basin Surveys, Missouri Basin Project, Lincoln, Nebraska.

This River Basin Survey report has information on Great Bend sites in Ellsworth County. See Smith 1949.

L

Leaf, Gary R.

1976 *Background Data for a Preliminary Shoreline Reconnaissance and a Management Plan for the Cultural Resources of the Kanopolis Lake, Ellsworth County, Kansas.* Museum of Anthropology, University of Kansas, Lawrence. Submitted to U.S. Army Corps of Engineers, Kansas City District.

1977 *A Preliminary Shoreline Reconnaissance for the Cultural Resources of the Kanopolis Lake, Ellsworth County, Kansas.* Museum of Anthropology, University of Kansas, Lawrence. Submitted to U.S. Army Corps of Engineers, Kansas City District.

These documents describe a variety of sites but include information on Great Bend sites in the Kanopolis Basin. See Grosser 1993; Smith 1949.

Lees, William B.

1985 *Results of a Cultural Resources Survey and Evaluation in the Vicinity of the Tobias (14RC8) and Thompson (14RC302) Sites, Little River Archeological District, Rice County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report contains information on two well-known Great Bend sites in central Kansas.

1987a An Open Letter on the Salvage Excavations at Marion, Kansas. *Journal of the Kansas Anthropological Association* 6(9):245-246.

1987b Highway Archeology Salvage Program Investigates Great Bend Aspect Site. *Kansas Preservation* 9(3):6-8.

These two brief papers review the then ongoing work at the Mem site (14MN328) near Marion. See Lees et al. 1989.

1988 Emergency Salvage Operations at Site 14MN328, A Great Bend Aspect Site at Marion, Kansas. *Journal of the Kansas Anthropological Association* 9(4):60-82.

This summary article on salvage excavations at the Mem site (14MN328) includes information about storage pits, structures, and artifacts.

1992 1992 Dig and Training Program. *Kansas Anthropological Association Newsletter* 4(3):3-9.

This notice of the pending Kansas Archeology Training Program field school at the Sharps Creek site (14MP408) in central Kansas includes a brief overview of the Great Bend aspect and the site.

1993 1993 Kansas Archeology Training Program. *Kansas Anthropological Association Newsletter* 5(2):2-11.

This announcement of the 1993 KATP at the Sharps Creek site (14MP408) reviews the 1992 season and the research questions.

Lees, William, and Rolfe Mandel
1993 Origin of the Mounds at Sharps Creek. *Kansas Anthropological Association Newsletter* 5(4):6-8.

This brief article resurrects the hypothesis, based on limited geomorphic work, that the mounds at the Sharps Creek site (14MP408) in central Kansas may mark the locations of houses or other structures.

Lees, William B., John D. Reynolds, T. J. Martin, Mary J. Adair, and Steven Bozarth
1989 *Final Summary Report: 1986 Archeological Investigations at 14MN328, A Great Bend Aspect Site along U.S. Highway 56, Marion County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

Although incomplete, this contract report offers important data on structures, as well as data on European contact, Native American trade, and plant use in Great Bend sites at Marion. The faunal, lithic, and ceramic analyses were not completed for this draft.

Lees, William B., John D. Reynolds, and Sondra Ridgeway
1989 *Kansas Preservation Plan Section on Historical Archeology.* Archeology Office, Kansas State Historical Society, Topeka.

The authors present synopses of investigations at those central Kansas Great Bend sites that have yielded items of European manufacture, as well as theoretical issues in historic archeology.

Lesser, Alexander
1979 Caddoan Kinship Systems. *Nebraska History* 60(2):260-271.

This paper considers the kinship systems of the Wichita, Pawnee, and Arikara.

Lindemuth, Tim
1990 Central Kansas Pre-Columbian Artifacts, Pottery Donated to Kansas State University. *Kansas Anthropological Association Newsletter* 2(2):4-5.

This is a press release concerning donation of the Ralph Bell Collection of artifacts to KSU, including many from Great Bend sites. See Roper 2000a on Pawnee ceramics from a central Kansas Great Bend site.

Logan, Brad (editor)
1997 *Archaeological Investigations at Kanopolis Lake, Kansas National Register Evaluation of 14EW3, 14EW6, and 14EW19 and Shoreline Survey (1463-1465 amsl).* Project Report Series No. 100. Office of Archaeological Research, University of Kansas, Lawrence.

This report includes information on the Thompson Creek site (14EW6). See Smith 1949.

Loosle, Byron N.
1991 *Social Interaction Among the Late Plains Village Populations in the Central Plains.* Unpublished Ph. D. dissertation, Department of Anthropology, University of Kansas, Lawrence.

Loosle reports on the excavations at the Major site (14RC2) and at 14RC306 in central Kansas. His discussion focuses on non-local materials, concluding that exchange was used to balance resource deficiencies and that exchange further indicates peaceful relations with many neighboring groups. See Spielmann 1983, 1991a; Vehik 2002.

M

Mallam, R. Clark
1984a Site of the Serpent: A Prehistoric Life Metaphor in South Central Kansas. *Occasional Publications of the Coronado-Quivira Museum* No. 1. Lyons, Kansas.

1984b The Serpent: A Prehistoric Life-Metaphor in South Central Kansas. *Journal of the Kansas Anthropological Association* 5(2):40-83.

These documents—the two are essentially identical—report Mallam's investigation of the figure of a serpent carved into a hillside in Rice County. He argues

that Great Bend people who lived in nearby villages created it.

Malone, Judith A., and Arthur H. Rohn
1981 *Survey and Assessment of the Cultural Resources, Marion Lake Project.* Archaeology Laboratory, Wichita State University, Wichita, Kansas. Submitted to U.S. Army Corps of Engineers, Tulsa District.

Manz, Kari L., Nancy E. Pearson, and Donald J. Blakeslee
1990 *Archaeological Survey and Testing, Rural Water District #1, Rice County, Kansas.* Department of Anthropology, Wichita State University, Wichita, Kansas. Submitted to Rural Water District #1.

This contract report contains information on numerous Great Bend sites in Rice County.

Mason, Otis T.
1881 Mounds in Cowley County. In *Annual Report of the Smithsonian Institution for 1880*, pp. 446. Smithsonian Institution, Washington, D.C.

Mason presents a summary of excavations by A. R. Reinsch in Lower Walnut sites.

Mead, James R.
1890 Camps of Prehistoric People in Sedgwick County, Kansas. *Transactions of the Kansas Academy of Science* 19:329-330.

An early explorer/trader reports on surface collection activities of Great Bend sites in the vicinity of present-day Wichita, Kansas.

1908 The Little Arkansas. *Kansas Historical Collections, 1907-1908* 10:7-14.

In this paper Mead provides a tantalizing, first-hand glimpse of the encampment of the Wichita and other tribes during the Civil War at the confluence of the Arkansas and Little Arkansas rivers in south-central Kansas.

Monger, Earl
1970 A Preliminary Report on the Larned Site. *Kansas Anthropological Association Newsletter* 15(8):1-15.

This is an important report by avocational archeologist Monger on the Larned or Lewis site (14PA307), which contained stratified Pratt and Great Bend components. There is much information on houses and site layout. See Gunnerson 1987; Ranney 1994.

Moorehead, William King
1931 *Archaeology of the Arkansas River Valley.* Yale University Press, New Haven, Connecticut.

Moorehead's volume is notable for the absence of detailed information on Great Bend sites concentrated on the Arkansas River and its tributaries.

Morris, Wayne
1970 The Wichita Exchange: Trade on Oklahoma's Fur Frontier, 1719-1812. *The Chronicles of Oklahoma* 9(2):79-84.

This short paper is about the Taovayas trade with the French in the eighteenth century.

Mudge, Benjamin F.
1873 Traces of the Mound Builders in Kansas. *Transactions of the Kansas Academy of Science* 2:5-6.

Mudge offers the first report of mounds, now known to mark Great Bend sites, up the headwaters of Cow Creek in Rice County. He attributes the mounds to the mound builders. (Editor's note: A popular belief throughout most of the nineteenth century was that a mysterious lost race, capable of great engineering feats, had created the thousands of earthen mounds that dotted the central United States. By the late 1880s it was becoming clear that the mounds were actually built by ancestors of the numerous American Indian groups that still inhabited the region.)

N

Nabokov, Peter, and Robert Easton
1989 *Native American Architecture.* Oxford University Press, New York.

Nabokov and Easton present a valuable and wide-ranging compendium of Native American architecture, including the Wichita grass house. The volume is well illustrated.

Neal, Larry
1974 Archaeological Investigations at the C. H. Stockton and Jim Butterfield Sites, Kay

County, North-Central Oklahoma. In *Kaw Reservoir—Central Section*, edited by Charles L. Rohrbaugh, pp. 77-110. Oklahoma River Basin Survey Archaeological Site Report No. 27. University of Oklahoma, Norman.

Although the ceramic evidence is ambiguous, Neal suggests that the Stockton site (34Ka99) may be related to Lower Walnut.

Newcomb, W. W.
1961 *The Indians of Texas from Prehistoric to Modern Times.* University of Texas Press, Austin.

Although dated, this book reviews the archeology and ethnohistory of Native Americans in Texas and includes considerable information on the Wichita and related groups. The volume has been reprinted several times without revision.

1976 *The People Called Wichita.* Indian Tribal Series, Phoenix, Arizona.

Perhaps the standard history and ethnohistory of the Wichita people from first contact into the twentieth century. See Elam 1971a, 1971b; other works by Newcomb; Smith 1996, 2000; papers in M. Wedel 1988.

1993 Historic Indians of Central Texas. *Bulletin of the Texas Archeological Society* 64:1-64.

Newcomb reviews historic Native Americans in central Texas and includes a lucid summary of the Wichita and related peoples throughout the southern Plains.

2001 Wichita. In *Plains*, edited by Raymond J. DeMallie, pp. 548-566. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

This review of Wichita ethnohistory and culture also contains a synonymy of names applied to the Wichita. Coverage is from 1541 into the 1990s. The paper does not appear to partake of recent studies, such as those by Vehik 1986, 1992, for instance.

Newcomb, W. W., and T. N. Campbell
1982 Southern Plains Ethnohistory: A Re-examination of the Escanjaques, Ahijados, and Cuitos. In *Pathways to Plains Prehistory, Anthropological Perspectives of Plains Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 29-44. Oklahoma Anthropological Society Memoir No. 3 and Cross Timbers Heritage Association Contributions No. 1. Duncan, Oklahoma.

This paper includes a discussion of Oñate's entrada into the Plains in 1601 and of a map drawn by a captured native, Miguel, of Tonkawa ethnicity. Although there is much information relevant to the ethnohistory of the Wichita, the paper is concerned with the identity of the "Escanjaque" encountered during the Oñate entrada. Vehik 1986 offers a reassessment. Warhus 1997 presents a brief discussion of the map as well, though in a different context.

O

O'Brien, Patricia J.
1984 *Archeology in Kansas.* Public Education Series No. 9. Museum of Natural History, University of Kansas, Lawrence.

This is a non-technical overview of Kansas archeology with information on Great Bend.

1994 The Central Lowland Plains: An Overview. In *Plains Indians, A.D. 500-1500*, edited by Karl H. Schlesier, pp. 199-223. University of Oklahoma Press, Norman.

O'Brien reviews cultural complexes in the Central Plains and proposes a revision of Great Bend taxonomy. She also offers the provocative hypothesis that the Pomona variant is ancestral Great Bend.

O'Bryant, Arch
1947 Differences in Wichita Indian Camp Sites as Revealed by Stone Artifacts. *Kansas Historical Quarterly* 15(2):143-150.

O'Bryant discusses some Great Bend and antecedent sites in south-central Kansas from the point of view of lithic resources. See Blakeslee and Hawley 2004b.

Odell, George H.
1988 *Archaeological Investigations at the Proposed Kimberly-Clark Tulsa Facility.* Department of Anthropology, University of Tulsa, Tulsa, Oklahoma. Submitted to Sirrine Environmental Consultants, Greenville, South Carolina.

1989 *Final Report on Archaeological Excavations Conducted Between May and July, 1988, at the Lasley Vore Site (34Tu65), Jenks, Oklahoma.* Department of Anthropology, University of Tulsa, Tulsa, Oklahoma. Submitted to Sirrine Environmental Consultants, Greenville, South Carolina.

These two contract reports present the results of excavations at the Lasley Vore (34Tu65), an eighteenth-century Wichita site.

1992 Bewitched by Mechanical Site Testing Devices. *American Antiquity* 57:692-703.

Odell reviews the use of a mechanical trenching tool to test the Lasley Vore site (34Tu65) and offers glimpses of an important site, occupied by several groups of Wichita during the early eighteenth century. See Odell 2002.

1998 The Protohistoric Period in Eastern Oklahoma: Evidence from Lasley Vore. *Bulletin of the Oklahoma Anthropological Society* 47:83-118.

In this article Odell reviews the 1719 journey of La Harpe and discusses the excavations at the Lasley-Vore site (34Tu65). See other papers by Odell, especially Odell 2002.

1999 The Organization of Labor at a Protohistoric Settlement in Oklahoma. *Journal of Field Archaeology* 26:407-421.

Odell analyzes the lithic use-wear patterns on tools from features at the Wichita Lasley Vore (34Tu65) site in Oklahoma. These reveal data on activity areas and the importance of hide processing at the site.

2001 The Use of Metal at a Wichita Contact Settlement. *Southeastern Archaeology* 20(2):173-186.

Odell discusses the acquisition, adoption, and frequent modification of metal trade goods from the point of view of the Wichita occupants of the Lasley-Vore site (34Tu65).

2002 *La Harpe's Post, a Tale of French-Wichita Contact on the Eastern Plains.* University of Alabama Press, Tuscaloosa.

The final report on the Lasley Vore (34Tu65) site, Odell presents a wealth of data on the site and its artifacts and reviews diplomatic travels of La Harpe, who may have visited the site in 1719. The volume offers a well-written look at Wichita life in the early eighteenth century and includes numerous appendices providing details on geomorphology, European-made artifacts, lithics, ceramics, animal bone, and botanical remains. For more on La Harpe, see M. Wedel 1971.

2003 Wichita Tools on First Contact with the French. In *Stone Tool Traditions in the Contact Era*, edited by Charles R. Cobb, pp. 29-50. University of Alabama Press, Tuscaloosa.

This paper discusses the Lasley Vore site (34TU65) stone tool assemblage at the time of contact with Europeans.

Odell, George H., John C. Dixon, Kent E. Dickerson, and Kenneth L. Shingleton, Jr.

1990 *An Archaeological Investigation of the Arkansas River Bluffline between Jenks and Bixby, Eastern Oklahoma.* Contributions in Archaeology No. 17. Department of Anthropology, University of Tulsa, Tulsa, Oklahoma.

This survey report provides additional data on Wichita sites in vicinity of the Lasley Vore site (34Tu65). See Odell 2002.

O'Neill, Brian

1980 The Kansas Petroglyph Survey. Ms. on file, Cultural Resources Division, Kansas State Historical Society, Topeka.

1981 *Kansas Rock Art.* Historic Preservation Department, Kansas State Historical Society, Topeka.

These two volumes survey of Native American rock art, including art related to the Great Bend-Wichita-speaking peoples. The latter is a slim, non-technical overview with many illustrations.

P

Parks, Douglas R.

1979 The Northern Caddoan Languages: Their Subgroupings and Time Depths. *Nebraska History* 60(2):197-213.

Parks reviews the North Caddoan languages and pro-

vides estimates of the time depth of their separation from one another.

2001a Caddoan Languages. In *Plains*, edited by Raymond J. DeMallie, pp. 80-93. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Parks reviews the North Caddoan languages: Arikara, Pawnee, Kitsai, and Wichita. Relationships among the Caddoan language family are also discussed.

2001b Kitsai. In *Plains*, edited by Raymond J. DeMallie, pp. 567-571. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Parks reviews the ethnohistory and culture of the Kitsai, speakers of a North Caddoan tongue that is similar to Wichita and Pawnee. The Kitsai were, in the eighteenth and nineteenth centuries, allied with the Wichita proper, Tawakoni, Waco, and others. See Rohrbaugh 1982.

2001c Enigmatic Groups. In *Plains*, edited by Raymond J. DeMallie, pp. 965-973. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Parks reviews references to a number of groups mentioned in documents of the sixteenth through nineteenth centuries. The reference is included here for comments on the Escanjaque or Aguacane and the Ahijados, groups mentioned by Oñate in 1601 and sometimes considered as Wichita or Wichita-related.

Peck, M. Michelle

2003 *A Study of Great Bend Aspect Hunting Camp Sites within the State of Kansas*. Unpublished Master's thesis, Department of Anthropology, Wichita State University, Wichita, Kansas.

Peck's study focuses on Great Bend aspect hunting campsites situated around the three major village complexes in Rice and McPherson, Cowley, and Marion counties. Seventeen sites were identified as probable campsite locations, based primarily on site size and diagnostic artifacts present in surface collections. Another 47 sites were recognized as possible campsite locations. Peck concludes that hunting camps exhibit distinctive characteristics that distinguish them from village sites.

Perttula, Timothy K., Myles R. Miller, Robert Ricklis, Daniel J. Prikyl, and Christopher Lintz

1995 Prehistoric and Historic Aboriginal Ceramics in Texas. *Bulletin of the Texas Archeological Society* 66:175-238.

A compendium of ceramic types found on Texas sites, the paper includes a section in which Prikyl and Perttula discuss Wichita ceramics.

Perttula, Timothy K, Marlin F. Hawley, and Frederick W. Scott

2001 Caddo Trade Ceramics. *Southeastern Archaeology* 20(2):154-172.

This report presents the results of instrumental neutron activation analysis, petrography, and macroscopic examination of Caddoan ceramics from Lower Walnut focus sites near Arkansas City in south-central Kansas.

Pratt, Larry

1957a Paint Creek. *Kansas Anthropological Association Newsletter* 2(7):2-3.

1957b Paint Creek: Part Two. *Kansas Anthropological Association Newsletter* 2(8):3-6.

These two short articles report on the Paint Creek site (14MP1) in central Kansas. Part one is an overview of work at the site by Udden and the 1934 Nebraska State Historical Society, and part two describes the ceramics and other artifacts recovered during the fieldwork.

Putnam, F. W.

1880 Report of the Curator. *Annual Report of the Peabody Museum of American Archaeology and Ethnology* 2(4):700-755. Peabody Museum, Cambridge, Massachusetts.

Putnam reports the acquisition of a small collection from Marion County, Kansas. Rohn and Emerson 1984 describe the artifacts more fully. See Wedel 1959.

R

Ranney, William H., Jr.

1994 *Redefining the Pratt Complex: Evidence from the Lewis Site*. Unpublished Master's thesis, Department of Anthropology, University of Kansas, Lawrence.

Avocational archeologist Earl Monger's work at the Larned or Lewis site (14PA307) is reported in this M.A. thesis. The thesis is important for information on houses, lithic economy, Great Bend settlement, and the hypothesis of cultural continuity of the Pratt complex and the Great Bend aspect. The provisional status of the complex was left, pending additional work. See Monger 1971.

Remsburg, George J.

1917 Miscellaneous Notes. *The Archaeological Bulletin* 8(1):8.

A brief note on excavations by Bert Moore, Harry Martin, and John Sterling at the later named Arkansas City Country Club site (14CO3). Although not mentioned in the report, a gunflint was recovered along with human remains. See Hawley 2000.

Reynolds, John D.

1982 *Phase III Archeological Study of Archeological Sites 14MN324, 14MN328, and 14MN331: Highway Projects 56-57-K-0561-01 and 56-57-K-0562-01, Marion County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This report presents survey efforts directed at Great Bend sites near Marion, potentially affected by highway realignment. See Lees 1987; Lees et al. 1989.

1985 Special Function Archeological Sites: Lithic Quarry and Collecting Stations and Workshop Sites. *Journal of the Kansas Anthropological Association* 5(3):91-100.

In this article on quarry and workshop sites, Reynolds proposes that Great Bend knappers selected certain stone according to the intended function of tools. See Butler 1997.

1993 19th Annual Kansas Archeology Training Program Scheduled for June. *Kansas Preservation* 15(2):1-3.

This notice announces the upcoming dig at the Sharps Creek site (14MP408) and reviews the previous (1992) field school at the central Kansas site.

Reynolds, John D., Harold Reed, and Greg Jackson

2001 Experiments in the Heat Treatment of Florence A Chert: A Preliminary Report. *The Kansas Anthropologist* 22:1-13.

The authors describe two thermal alteration experiments on Florence A chert carried out in conjunction with the 1994 Kansas Archeology Training Program field school at Arkansas City. The experiments bear on the use of Florence A chert from the extensive quarries in the southern Flint Hills by Lower Walnut populations. See Cooper 1975; Wedel 1959.

Richards, Dorothy D.

1956 Petroglyphs of Kansas and Colorado. *Kansas Anthropological Association Newsletter* 1(9):2-9.

This general report on petroglyphs contains some information on the Peverly Farm site (14RC10) in central Kansas. See O'Neill 1980; Wedel 1959, 1969.

Richey, W. E.

1900 The Real Quivira. *Kansas Historical Collections, 1897-1900* 6:477-485.

This dated discussion of historical documents locates Quivira near Junction City, Kansas. For the history of the controversy between Richey and Brower over the location of Quivira, see Brower 1898, 1899, 1903; Judge 1982.

1904a Early Spanish Explorations and Indian Implements in Kansas. *Kansas Historical Collections, 1903-1904* 8:152-168.

In this dated review of Spanish exploration in the Plains, Richey identifies several artifacts, including a sword, as possibly of Spanish origin and affirms the location of Quivira in north-central Kansas.

1904b Report of Committee on Mounds and Village Sites. *Kansas Historical Collections, 1903-1904* 8:135-136.

Richey offers brief comments on sites near Lindsborg in McPherson County.

Rohn, Arthur H.

1994 *Arkansas City Sites 14CO501, 1509, 1510: Survey and Testing.* Department of Anthropology, Wichita State University, Wichita, Kansas. Submitted to U.S. Army Corps of Engineers, Tulsa District.

Rohn reports on the results of archeological survey

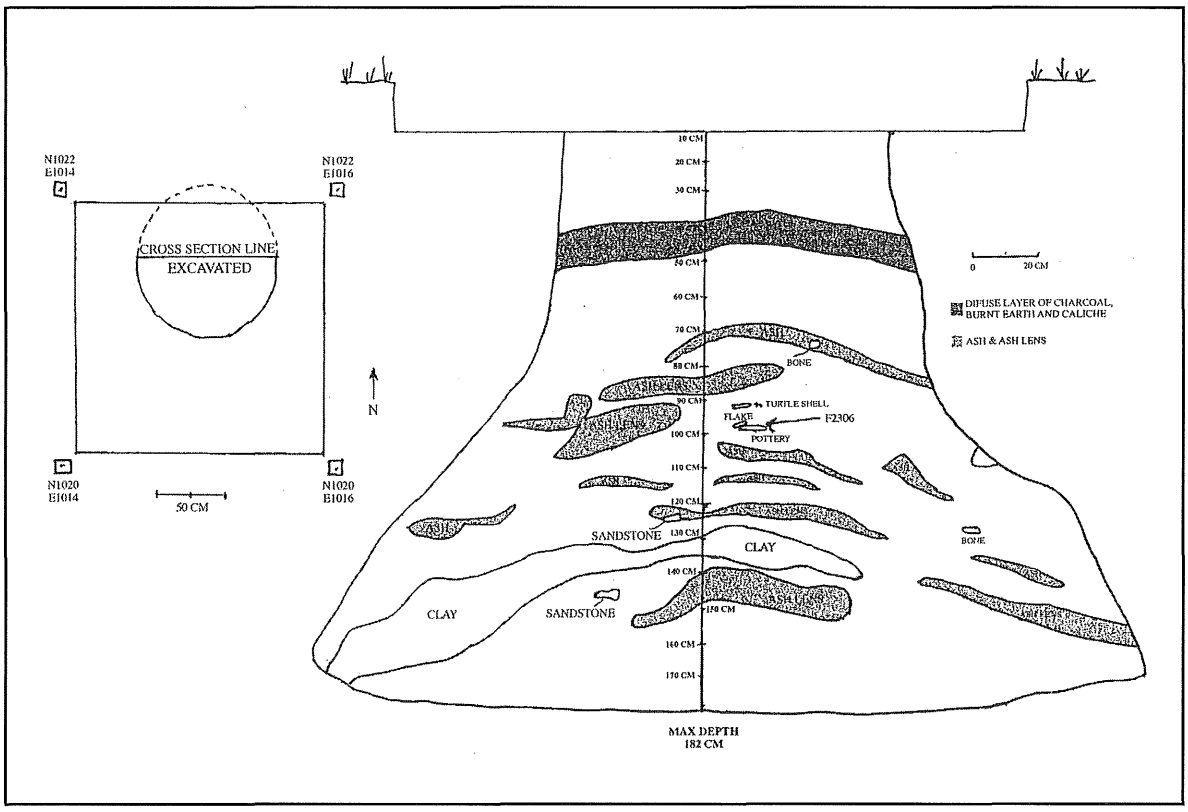

Figure 5. East to west profile of F454, facing north, N1020/E1014, 14MP408. From a drawing by William B. Lees, Lin Lohrmeyer, Cleve Mulder, June 14, 1993. (Romine 1997:29, Figure 2)

and test excavations at several sites within the large complex of Lower Walnut sites located north of the confluence of the Walnut and Arkansas Rivers, near Arkansas City, Kansas. See Hawley and Haury 1994.

Rohn, Arthur H., and Alice M. Emerson
1984 *Great Bend Sites at Marion, Kansas.* Publications in Anthropology No.1. Wichita State University, Wichita, Kansas.

This contract report summarizes the first extensive professional work in the Great Bend sites at Marion. It makes clear that they differ from both the Lower Walnut and Little River sites but does not propose any new classification scheme for them. See Emerson 1977; Lees et al. 1989.

Rohn, Arthur H., Beverly M. Larson, and Mark S. Davis
1982 *A Survey and Assessment of the Cultural Resources at Kaw Lake, Northern Section (Kansas).* Archaeology Laboratory, Wichita State University, Wichita, Kansas. Submitted to U.S. Army Corps of Engineers, Tulsa District.

In this contract report for survey in the Kaw Lake, the authors present additional data on Great Bend sites in the lower Walnut River valley.

Rohn, Arthur H., and Judith A. Malone
1980 *Cultural Resources Reconnaissance Survey, Marion County Lake Improvement District, Marion County, Kansas.* Archaeology Laboratory, Wichita State University, Wichita, Kansas. Submitted to U.S. Environmental Protection Agency.

This contract report discusses sites in the Marion, Kansas, area of Great Bend affiliation. See Emerson 1977; Rohn et al. 1982; Rohn and Emerson 1984.

Rohn, Arthur H., and Dennis R. Porter
1982 *Butler County Rural Water District Number*

Seven Cultural Resource Reconnaissance. Department of Anthropology, Wichita State University, Wichita, Kansas.

This contract report contains information on a cluster of Great Bend sites in the Whitewater River valley.

Rohrbaugh , Charles L.

1982 An Hypothesis for the Origins of the Kichai. In *Pathways to Plains Prehistory: Anthropological Perspectives of Plains Natives and their Pasts,* edited by Don G. Wyckoff and Jack L. Hofman, pp. 51-61. Oklahoma State Historical Society Memoir No. 3 and Cross Timbers Heritage Association Contributions No. 1. Duncan, Oklahoma.

Rohrbaugh hypothesizes that the Kichai (or Kitsai) may derive from the Fort Coffee phase of the Arkansas River valley and that Fort Coffee may be ancestral to the Norteño focus in Texas. See Vehik 1994.

Romine, John

1997 The Story Told by the Flotation Samples from Feature 454 at the Sharps Creek Excavations of 1992-1993. *The Kansas Anthropologist* 18(1):27-34.

Romine affirms the importance of flotation, highlighting the recovery of a chain mail ringlet, as well as floral and faunal material from a particular feature at the Sharps Creek site (14MP408) in central Kansas (Figure 5).

1998 Sharps Creek Site Arrow Point Analyzed. *Kansas Preservation* 20(3):14-16.

Romine reports the find of animal blood residues on a projectile point from the Sharps Creek site (14MP408).

Rood, David S.

1976 *Wichita Grammar.* Garland, New York.

This is a major study of the Wichita language, a North Caddoan tongue related to Kitsai and Pawnee. Rood provides references to a few earlier linguistic studies (mostly word lists). The volume concludes with a list of Wichita-English, English-Wichita morphemes (by Jean O. Charney). For additional references on Wichita language, see Parks 2001a; Rood 1996.

1996 Sketch of Wichita, A Caddoan Language. In *Languages*, edited by Ives Goddard, pp. 580-608. *Handbook of North American Indians*, vol. 17, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Rood discusses the phonology, grammar, and semantic and surface structures of Wichita. See Parks 2001a; Rood 1976.

Roper, Donna C.

1995a *An Archaeological Survey of a Proposed Gas Line Relocation, Marion County, Kansas.* Submitted to Gas Service, Western Resources, Topeka.

This contract report describes one new Great Bend site in the Cottonwood River valley.

1995b *An Archaeological Survey of the East Marion Interceptor Sewer Project, Marion, Kansas.* Submitted to City of Marion, Kansas.

1996 *Preliminary Report of Phase 3 Archaeological Investigations at 14MN515, Marion County, Kansas.* Submitted to City of Marion, Kansas.

Roper's 1995 and 1996 contract reports cover 14MN515, a Great Bend site near Marion.

1999 Arkansas City Overcomes Emergency Project Challenge. *Kansas Preservation* 21(1):2-3.

This article is a brief discussion of the emergency salvage of Great Bend materials from the proposed levee area at Arkansas City.

2000a *Archaeological Investigations on a Portion of 14MN515, a Great Bend Aspect Village Site, Marion, Kansas.* Submitted to City of Marion, Kansas.

This contract report continues to summarize work at 14MN515.

2000b Lower Loup Pottery in Great Bend Aspect Sites. *Plains Anthropologist* 45(172):169-177.

This article documents two Pawnee pottery sherds from Great Bend sites 14RC10 and 14MP2. Roper views the sherds within the historic context of friendly interaction between the Wichita and the Pawnee. See Blaine 1982; Udden 1900.

2000c Radiocarbon Dating Provides Clues to Early Settlement in Marion County. *Kansas Preservation* 22(5):8-9, 12.

Roper reviews the work at 14MN515 in Marion County and discusses of radiocarbon dates from the site.

2000d Investigations of Great Bend Aspect Sites in Marion and McPherson Counties. *Current Archaeology in Kansas* 1:31-36.

Roper reviews recent research at 14MN515 and the Ralph Bell collection. She reaffirms the divergence in lithic source areas between the Smoky Hill River sites and those in Rice County and indicates that the Smoky Hill River sites and those at Marion have a similar signature. Also, she concludes that the Smoky Hill River sites may post-date the Rice County occupation.

2002 The Marion Great Bend Aspect Sites: Floodplain Settlement on the Plains. *Plains Anthropologist* 47(180):17-32.

Roper discusses floodplain settlement, a pattern found in the Great Bend sites at Marion and in the Lower Walnut sites, contrasting it with the pattern evident in Little River. She concludes that land arable via bone-hoe technology is the key to understanding it.

2003 The Whiteford Family of Salina: Mid-Twentieth Century Avocational Archeologists. *Kansas History* 25(4):244-257.

This biographical study of noted Kansas avocationalists includes comments on work done at the Paint Creek site (14MP1).

Ross, E. C.

1928 The Quivira Village. *Kansas Historical Collections, 1926-1928* 17:514-534.

This is a review, occasionally rather imaginative, of Horace and Paul Jones' work in sites near Lyons, Kansas. See H. Jones 1928; P. Jones 1929, 1937.

Rowlison, Don

1981a KAA Dig Uncovers Pithouses Near Lyons. *Kansas Preservation* 3(6):1-2.

1981b KAA Dig and Kansas Archeology Training Program Uncovers Pithouses Near Lyons. *Journal of the Kansas Anthropological Association* 2(5 & 6):118-120.

These two documents report briefly on the 1981 KATP dig at 14RC306, where pit houses were found. See Loosle 1991.

1983a Plans for the Kansas Anthropological Association Annual Dig and Kansas Archeology Training Program. *Journal of the Kansas Anthropological Association* 4(6):87-92.

This announcement of the Kansas Archeology Training Program dig to be held at the Crandall site (14RC420) in central Kansas contains brief comments about the site.

1983b Central Kansas Site is Location of KAA Dig. *Kansas Preservation* 6(1):1-3.

This notice of the upcoming field school at the Crandall site (14RC420) in central Kansas contains an overview of the site.

Rucker, Marc D.

1971 Additional Puebloan Sherd Dates from Kansas. *Kansas Anthropological Society Newsletter* 17(4):1-6.

This article discusses the identification of Puebloan pottery from three central Kansas sites: the Malone site (14RC5) and two Pratt complex sites, 14PT1 and 14PT408. See Hawley 2000; Jones 1975; Ranney 1994; Thies 1987; W. Wedel 1982.

S

Schoen, Christopher M.

1992 *Phase III Investigations at the Saxman Site, 14RC301*. Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This is a report on archeological testing on a portion of the Saxman site (14RC301) in central Kansas. Although no subsurface remains were found, the report does include information about the site, including the recovery by two amateurs in 1974 of 13 pounds of chain mail. See Terry and Terry 1960, 1961.

1994 *Archeological Survey of a Proposed Gas Pipeline Route Near Little River, Rice County, Kansas*. Archeology Office, Kansas State Historical Society, Topeka. Submitted to Mid-America Pipeline Company, Tulsa, Oklahoma.

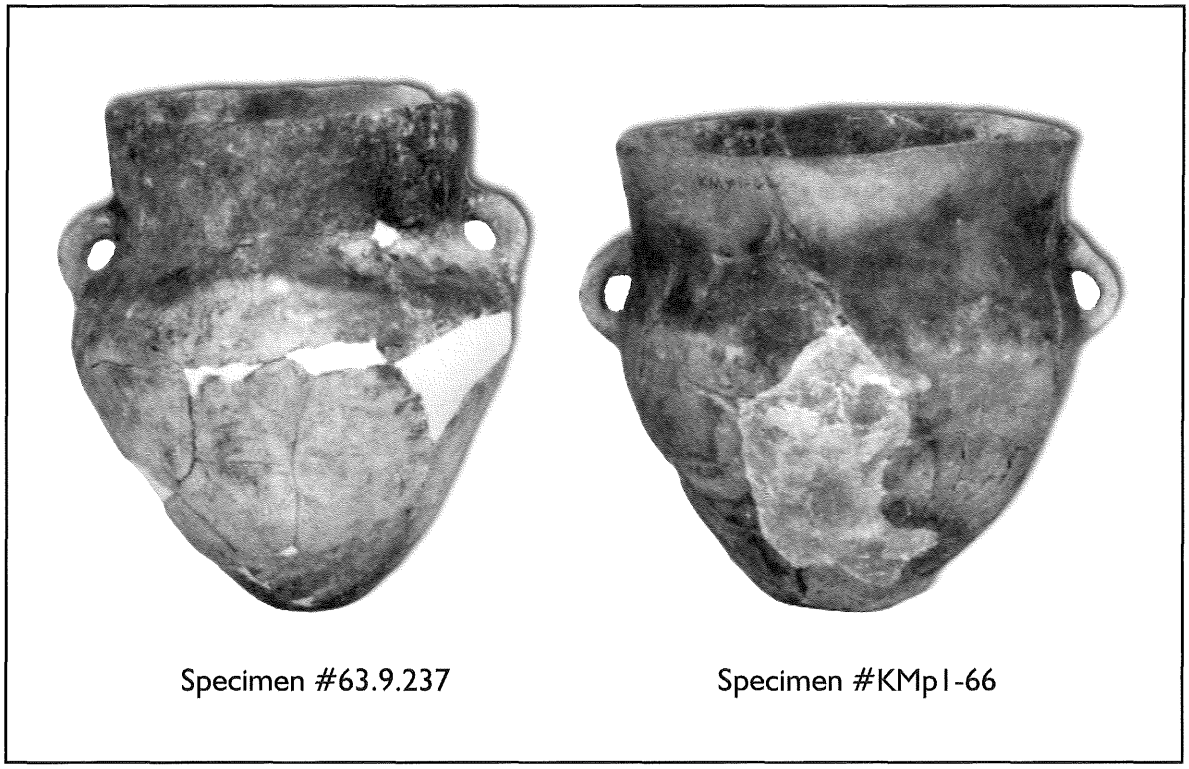

Figure 6. Reconstructed vessels from the Paint Creek site (14MP1). (Scott 1994:82, Figure 1 [continued])

This is a contract report on a pipeline survey in Rice County that passed near a newly recorded site with pottery identified as Little River Cordroughened and Pratt complex Ware A. The site had a diverse collection of tools and debitage made from a wide variety of materials, including chipped hematite.

Scott, Frederick W.
1994 Notes on Great Bend Aspect Ceramic Vessels in the KSHS Collections. *The Kansas Anthropologist* 15(1):70-88.

This paper discusses the various Great Bend ceramic types and illustrates the numerous reconstructed Lower Walnut and Little River pottery vessels at the Kansas State Historical Society (Figure 6).

Schlesier, Karl H.
1994 Commentary: A History of Ethnic Groups in the Great Plains. In *Plains Indians, A.D. 500-1500*, edited by Karl H. Schleiser, pp. 308-381. University of Oklahoma Press, Norman.

This wide-ranging summary and discussion of the culture history of the Great Plains includes the Wichita peoples. Schlesier argues that disease may have played a pivotal role in the development and movement of the Wichita.

Schmits, Larry J.
1989 *Archaeological and Geomorphological Survey and Testing at Kanopolis Lake, Ellsworth County, Kansas.* Environmental Systems Analysis, Inc., Kansas City. Submitted to U.S. Army Corps of Engineers, Kansas City District.

This report includes information on Great Bend sites, such as the Thompson Creek site (14EW6) and other petroglyph sites in the Kanopolis Basin.

Schmitt, Karl, and Iva Osanai Schmitt
1950s *Wichita Kinship Past and Present.* University Book Exchange, Norman, Oklahoma.

This monograph is the product of several years of fieldwork in the late 1940s and early 1950s. There is a detailed study of older and modern (1950s) kinship terminologies and practices along with a discussion of inferential, as well as documented, changes that have taken place.

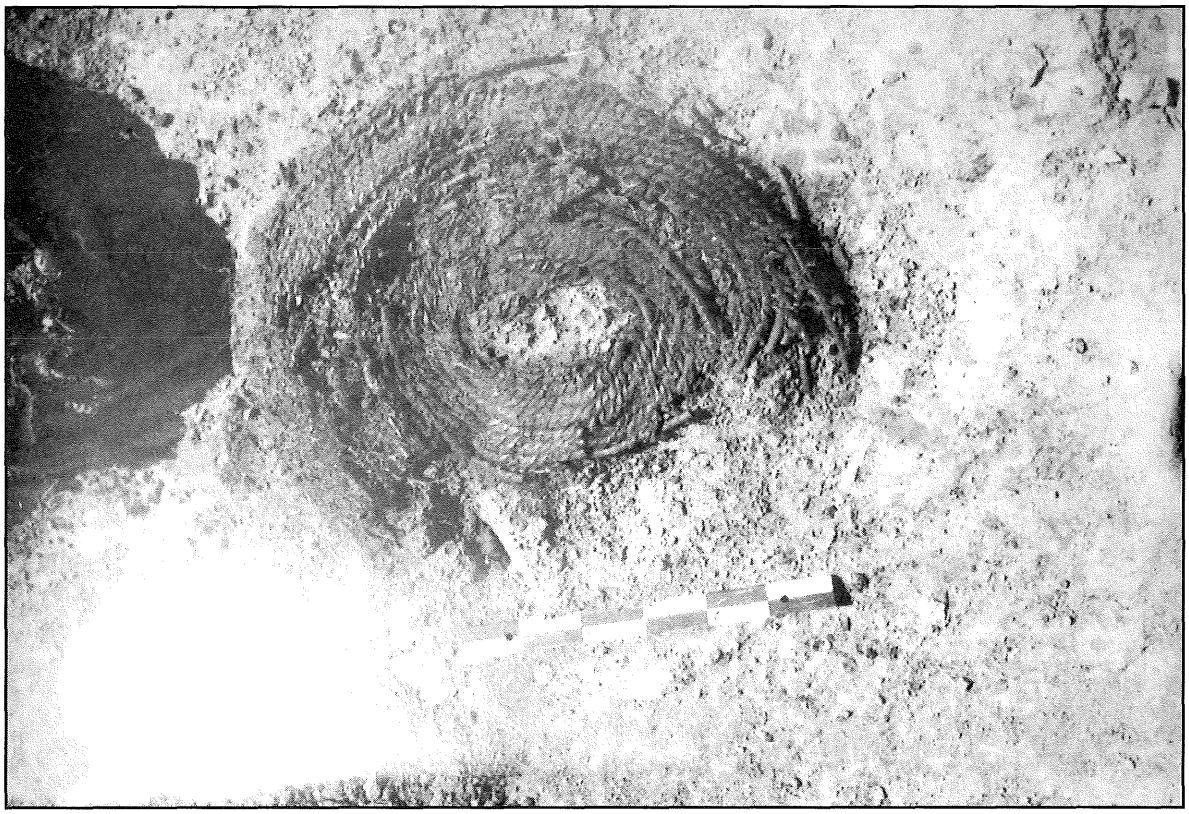

Figure 7. Charred basket in situ in Basin #2 at the Tobias site (14RC8), 1940. (Slattery 1995:21, Figure 25)

Shingleton, Kenneth L., Jr.
1991 *Pottery from the Lasley Vore Site, 34Tu65, in Eastern Oklahoma: Solving the Problem of Intrasite Spatial Ethnicity through Ceramic Analysis*. Unpublished Master's thesis, Department of Anthropology, University of Tulsa, Tulsa, Oklahoma.

Shingleton analyzes the ceramics from the Lasley Vore site (34Tu65) in Oklahoma, using both stylistic attributes and chemistry, and concludes that at least three different groups were responsible for making the pottery. See Odell 2002.

Shingleton, Kenneth L., Jr., George H. Odell, and Thomas M. Harris
1994 Atomic Absorption Spectrophotometry Analysis of Ceramic Artefacts from a Protohistoric Site in Oklahoma. *Journal of Archaeological Science* 21:343-358.

This is an analytical study of Lasley Vore site (34Tu65) ceramics. See Odell 2002; Shingleton 1991.

Skinner, S. Alan
1978 Historic Wichita Figurines from the Edge of the Llano Estacado. *Great Plains Journal* 17:40-48.

Several clay figurines, including human, horse, and dogs, were found on a site on the Colorado River in west Texas. The figurines are apparently similar to ones from the Spanish Fort site on the Red River.

Slattery, Richard G.
1995 Four Seasons in Pre-World War II Archeology. *The Kansas Anthropologist* 16(1):1-23.

This is a memoir by a crewmember on Wedel's 1940 expedition, which tested Great Bend sites in central and south-central Kansas (Figure 7). See Wedel 1940, 1959.

Smith, Carlyle S.
1949 Archaeological Investigations in Ellsworth and Rice Counties, Kansas. *American Antiquity* 14(4):292-300.

Smith's article summarizes excavations at the Major site (14RC2) and proposes a new ceramic type, Little

River Cordroughened, possibly an ancestral type. For an extended report on the Major site, see Loosle 1991.

Smith, F. Todd

1996 *The Caddos, the Wichitas, and the United States, 1846-1901.* Texas A & M University Press, College Station.

2000 *The Wichita Indians: Traders of Texas and the Southern Plains, 1540-1845.* Texas A & M University Press, College Station.

Together these two volumes present a history of the Wichita from first contact to the early twentieth century, focusing on external relations. The volumes are stronger for more recent history than for the early contact period. See Newcomb 1976, 2001; papers in M. Wedel 1988.

Smith, James E. II, with contributions by Jay C. Blaine, Kathleen Gilmore, R. King Harris, and Inus M. Harris

1993 The Vinson Site (41LT1): A Norteño Focus Indian Village in Limestone County, Texas. *Bulletin of the Texas Archeological Society* 64:65-162.

This is an excavation report on the Vinson site (14LT1), a Norteño focus site in Texas. The Norteño focus is believed to be an historic manifestation of the Wichita peoples. See Blaine 1993; Rohrbaugh 1982; Yates 1993.

Sollberger, J. B.

1971 A Technological Study of Beveled Knives. *Plains Anthropologist* 16(53):209-218.

Sollberger analyzes a tool form common to all Great Bend and other bison hunting cultures, demonstrating that their form is a product of use and resharpening.

Spielmann, Katherine C.

1983 Late Prehistoric Exchange Between the Southwest and Southern Plains. *Plains Anthropologist* 28(102, pt.1):257-272.

Spielmann argues that Plains-Pueblo exchange is reflective of the interdependence of horticultural and non-horticultural subsistence systems. In her discussion Spielmann does consider briefly the role of Great Bend within this ecological model. See Baugh 1984, 1991; Spielmann 1991a, 1991b; Vehik 2002a, 2002b; M. Wedel 1982b.

1991a *Interdependence in the Prehistoric Southwest.* Garland, New York.

In this published version of her 1982 dissertation, Spielmann constructs an ecological model for Plains-Puebloan interaction, including Great Bend. See Baugh 1984, 1991; Spielmann 1983, 1991b; Vehik 2002a, 2002b.

1991b Coercion or Cooperation? Interaction Among Nonhierarchical Societies. In *Farmers, Hunters, and Colonists*, edited by Katherine A. Spielmann, pp. 1-17. University of Arizona Press, Tucson.

In her introductory remarks to this volume, Spielmann discusses various types of interaction between Plains and Puebloan groups, including Great Bend. See Baugh 1984, 1991; Spielmann 1983, 1991a; Vehik 2002a, 2002b.

Spring, Otto F.

1967 Prehistoric Chert Quarries in Kay County: A Report. *The Chronicles of Oklahoma* 45(1):5-11.

This article reports on fieldwork, conducted in the 1920s, on quarries important to Great Bend peoples. See Vehik 1985, 1986, and 1988; for discussion of the Maple City quarries (14CO5), see Wedel 1959.

Stallard, Alvis, Sanford L. Maples, and Thomas A. Witty

1966 *The Use of Photo Interpretation in Archeological Salvage Programs in Kansas.* Special Report No. 2. State Highway Commission of Kansas Research Department, Photronics Department, Topeka.

This report summarizes efforts to use aerial photographs as an adjunct to archeological investigation and includes a study of Great Bend sites in McPherson County, Kansas.

Steen, Charlie R.

1953 Two Early Historic Sites on the Southern Plains. *Bulletin of the Texas Archeological Society* 24:177-188.

Steen briefly discusses the late Wichita Deer Creek and Spanish Fort sites in Oklahoma based on surface collections. See Sudbury 1976.

Stein, C. Martin

1980 State Formulates Plans for Future of Tobias Site. *Kansas Preservation* 2(6):4-5.

This article discusses the Tobias site (14RC8) in central Kansas, the investigations conducted over the years there, acquisition of the property by the state, and plans to construct an on-site research facility.

1981a KAA Plans Dig Near Lyons. *Kansas Preservation* 3(4):3.

This brief notice tells of plans for Kansas Archeology Training Program dig to be held at the Kermit Hayes site (14RC306).

1981b KAA Replicated Grass Lodge Near Lyons. *Kansas Preservation* 3(5):5.

This is a brief summary of an experimental archeology program replication of a grass lodge and various tools, such as bison scapula hoes. See Brogan and Reynolds 1982.

1983a *The Kansas Archeology Training Program Archeological Survey in Rice County: A Summary Report of Activities in 1983*. Historic Preservation Office, Kansas State Historical Society, Topeka.

This reports on surveys undertaken during the KATP field school that reports eight new sites.

1983b KAA Members Complete Survey in Rice County. *Kansas Preservation* 5(5):5.

A brief report on the survey associated with the KATP, based on Stein 1983a.

1986a KAA Archeological Survey Completed in McPherson and Rice Counties. *Kansas Preservation* 8(5):4.

This is a brief report of survey results in vicinity of C. F. Thompson (14RC9) and Saxman (14RC301) sites in central Kansas.

1986b Sites in South Central Kansas are Guides to Regional Diversity. *Kansas Preservation* 8(3):6-7.

This article discusses Middle Ceramic period cultures, including the Pratt complex.

1987 History Provides Glimpses of the Late Ceramic Period. *Kansas Preservation* 9(5):6-7.

Stein briefly discusses the Great Bend aspect and the value of historic documents, although attention is focused on structural types (i.e., pithouses, council circles) that receive no mention in early documents.

1988 The Search for Quivira Leads to Other Frontiers. *Kansas Preservation* 10(5):1, 3-4.

This is an overview of the Great Bend aspect.

1992a Lindsborg 1992: Report on the KATP and Dig. *Kansas Anthropological Association Newsletter* 4(4):7-9.

This brief article reports on a survey in the vicinity of the Sharps Creek site (14MP408), conducted in conjunction with Kansas Archeology Training Program field school.

1992b Kansas Archeology Training Program Investigates Site in McPherson County. *Kansas Preservation* 14(5):1-3.

This article reviews the Kansas Archeology Training Program dig at the Sharps Creek site (14MP408) in McPherson County.

2004 *Lower Walnut Archeology: Archeological Investigations in the Walnut River Valley (1994-1996)*. Archeology Office, Kansas State Historical Society, Topeka, in preparation. Submitted to Kansas Department of Transportation, Topeka.

This massive report summaries fieldwork that took place ahead of highway construction in the vicinity of Arkansas City, Kansas, from 1994 through 1996. Eight archeological sites that are part of the Lower Walnut settlement were investigated. Permanent features, including 419 bell-shaped, cylindrical, and basin-shaped pits, and artifacts are described. Special studies include floral, phytoliths, faunal, fresh water mussel, marine shell, obsidian, archeological turquoise, pipestone, Southwestern ceramics, glass beads, and archaeomagnetic dating. Radiocarbon dates indicate an occupation between about A.D. 1450 to A.D. 1700.

Stein, Martin, and John Reynolds

1994 Querying the Quarry: KATP Lithic Technol-

ogy Class at 14CO5. *Kansas Anthropological Association Newsletter* 6(4):7-10.

This is a summary of 1994 investigations at the Maple City quarries, important to Lower Walnut peoples.

Story, Dee Ann

1985 The Walton Site: An Historic Burial in McLennan County, Texas. *Central Texas Archeologist* 10:66-96.

This reports on a late-eighteenth-century burial in central Texas that appears related to the Stone site (41ML65), the probable Tawakoni village of Quiscat, occupied from ca. 1770 to 1786.

Sudbury, Byron

1976a KA-3, The Deer Creek Site: An Eighteenth Century French Contact Site in Kay County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society* 6(9):226-323.

Sudbury's paper presents a detailed analysis of an extensive surface collection from the Deer Creek site (34Ka3). See M. Wedel 1981; Wyckoff 1964. Hartley 1975 and Hartley and Miller 1977 report investigations at the nearby Bryson-Paddock site (34Ka5).

1976b Relationship of the Deer Creek (Ka-3) and Bryson (Ka-5) Sites to the Love Site (Ka-2). *Oklahoma Anthropological Society Newsletter* 24(5):3-4.

1982 Three Eighteenth Century Pottery Vessels from North-Central Oklahoma. In *Pathways to Plains Prehistory, Anthropological Perspectives of Plains Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 45-50. Oklahoma Anthropological Society Memoir No. 3 and Cross Timbers Heritage Association Contributions No. 1. Duncan, Oklahoma.

Sudbury presents a detailed description and analysis of three vessels from the Deer Creek site (34Ka3) in Kay County, Oklahoma.

T

Terry, Kenneth, and Ina Terry

1960 Chain Mail and Other Materials from South Central Kansas. *Kansas Anthropological Association Newsletter* 6(4):29-32.

1961 Chain Mail and Other Exotic Materials from South Central Kansas. *Plains Anthropologist* 6(12, pt. 2):126-129.

These papers by two avocational archeologists report the find of chain mail and Puebloan artifacts from the Saxman site (14RC301).

Thies, Randall M.

1983 *From K-150 North to Lincolnville: Results of an Archeological Survey of Highway Project K-0556, Marion County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report records a new Great Bend site, 14MN397, in the Clear Creek drainage.

1986 Plans for the 1986 Kansas Archeology Training Program and Annual Dig. *Journal of the Kansas Anthropological Association* 6(5):68-74.

This is the announcement of the upcoming KATP dig at the C. F. Thompson site (14RC9) in central Kansas.

1987 From the Pueblos to the Plains: Origins of Certain Southwestern Sherds Found at Saxman and Crandall. *Journal of the Kansas Anthropological Association* 6(9):226-232.

This article reviews recent finds of more than a dozen Puebloan sherds found during Kansas Archeology Training Program digs at the Crandall site (14RC420) and by local amateurs at the Crandall and Saxman (14RC301) sites in central Kansas.

1991a *Archeological Resources of Selected Portions of the Lower Walnut Valley: Results of the 1990 Investigations.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to U.S. Army Corps of Engineers, Tulsa District.

This report presents the results of survey work in the lower Walnut River valley near Arkansas City, Kansas. Several newly reported sites are discussed, as is the investigation of features at several, including a possible pithouse at 14CO102. See Hawley et al. 1993; Hawley and Haury 1994; Rohn 1994; Wulfkuhle 1993.

1991b *Results of an Archeological Survey of Certain Portions of the Northern Section of the Proposed Arkansas City Bypass Area: The 1990 Investigation.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report presents the findings of reconnaissance work conducted in advance of proposed highway construction in the lower Walnut River valley near Arkansas City, Kansas. See Hawley et al. 1993; Hawley and Haury 1994; Rohn 1994; Wulfkuhle 1993.

1993 Human Tooth Is Probably Coyote. *Kansas Anthropological Association Newsletter* 5(3):1-2.

A tooth found during Kansas Archeology Training Program investigations at the Sharps Creek site (14MP408) in central Kansas was found not to be human.

1995 *Waterways at the Malone Site, 14RC5: Archeological Survey of an NRCS* [Natural Resources Conservation Service] *Undertaking in Rice County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report contains information on the Malone site (14RC5).

2003 *Looking for 14RC307: Archeological Survey of KDOT Project C-4007, Rice County, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to Kansas Department of Transportation, Topeka.

This contract report contains information on Great Bend site 14RC307.

Thoburn, Joseph B.

1927 An Important Archaeological and Historical Discovery. *The Chronicles of Oklahoma* 5:407-413.

This paper offers Thoburn's comments on investigations in Rice County, Kansas, and contests the assertion that the central Kansas Great Bend sites represent Quivira. An untitled version of it was published in the *Twenty-Sixth Biennial Report of the Board of the Directors of the Kansas State Historical Society*, 1931, pp. 46-50.

Thode, Ralph C.

1961 Salvage Work at the Tobias Site. *Kansas Anthropological Association Newsletter* 7(3):1-3.

Thode discusses a local salvage effort that recovered artifacts, including Puebloan ceramics, from pits encountered by a county road construction crew at the Tobias site (14RC8) in central Kansas.

Thompson, Joe Bill

1995 *Ceramics from the Lasley Vore Site, 34Tu65: A Study in Types, Technology, Morphology, and Use.* Unpublished Master's thesis, Department of Anthropology, University of Tulsa, Tulsa, Oklahoma.

This thesis presents a detailed study of the ceramics from the eighteenth-century Lasley Vore site (34Tu65). See Odell 2002; Shingleton 1991.

Thoms, Alston V., and David V. Hill

1979 *A Cultural Resources Reconnaissance Survey and Assessment of the Arkansas City Local Flood Protection Project, Cowley County, Kansas.* Technology Research and Development, Inc., Oklahoma City.

This contract report on a survey in the upper reaches of Kaw Reservoir identifies several previously unreported Lower Walnut focus sites.

U

Udden, Johan A.

1900 *An Old Indian Village.* Augustana Library Publication No. 2. Augustana College, Rock Island, Illinois.

An early monograph reports on excavations at the Paint Creek site (14MP1) in McPherson County, Kansas. The report was reproduced in Volume 23 of *The Kansas Anthropologist.* See Hawley 2002; Vehik 2002b; Wedel 1934, 1959.

V

Vehik, Rain

1967 *An Archaeological Evaluation of South-Cen-*

tral Kansas. Unpublished Master's thesis, Department of Anthropology, Wichita State University, Wichita, Kansas.

This thesis primarily discusses the results of excavations at the Augusta site (14BU501) on the upper Walnut River along with surface collections from the Zyba (14SU501), Chikaskia (14KG501), and Furman (14SG501) sites. Only Augusta and Zyba have components definitely belonging to the Great Bend aspect.

Vehik, Susan C.

1976 The Great Bend Aspect: A Multivariate Investigation of its Origins and Southern Plains Relationships. *Plains Anthropologist* 21(73, pt. 1):199-206.

Employing a multivariate analysis of ceramic attributes, Vehik suggests an in situ cultural development for Great Bend, rather than migration.

1985 Late Prehistoric Settlement Strategy and Exploitation of Florence-A Chert. In *Lithic Resource Procurement: Proceedings from the Second Conference on Prehistoric Chert Exploitation*, edited by Susan C. Vehik, pp. 81-98. Occasional Paper No. 4. Center for Archaeological Investigations, Carbondale, Illinois.

In this paper Vehik argues that the exchange of Florence A chert in Late Prehistoric (Lower Walnut) times was so important that the Florence A quarries affected settlement, as sites were placed as close as possible to them, while also balancing subsistence needs.

1986a Oñate's Expedition to the Southern Plains: Routes, Destinations, and Implications for Late Prehistoric Cultural Adaptations. *Plains Anthropologist* 31(111):13-33.

This reassessment of historic data from the Oñate entrada, including a map drawn by a captive native, proposes two possible locations as termini for the 1601 expedition. Inter-group tribal relations, social complexity, and exchange are also considered. See Newcomb and Campbell 1982.

1986b The Effects of Trade on Resource Procurement Behavior: A Late Prehistoric Example from the Southern Plains. In *Current Trends in Southern Plains Archaeology*, edited by Timothy G. Baugh. Memoir No. 21. *Plains Anthropologist* 31(114, pt. 2):141-154.

Focusing on the exchange of Florence-A chert from the southern Flint Hills among Late Prehistoric populations, Vehik considers the effects of this exchange on procurement and settlement location.

1988 Late Prehistoric Exchange on the Southern Plains and Its Periphery. *Midcontinental Journal of Archaeology* 13:41-68.

An analysis of Florence-A chert from quarries in the southern Flint Hills at Spiro, Washita River phase sites, and Edwards complex sites suggests that exchange was organized differently in the Late Prehistoric than in the Historic period.

1990 Late Prehistoric Plains Trade and Economic Specialization. *Plains Anthropologist* 35(127):125-145.

This paper investigates Late Prehistoric exchange and finds that 1) Florence A chert was an important resource and 2) exchange of the chert, generally in the form of large bifaces, was substantial among Plains Village groups and between Plains Village groups and non-Plains villagers.

1992 Wichita Culture History. *Plains Anthropologist* 37(141):311-332.

Vehik reviews historic documents and concludes that Wichita groups at and prior to contact with Europeans were widely dispersed and socially, politically, and economically distinct populations.

1993 Dhegiha Origins and Plains Archaeology. *Plains Anthropologist* 38(146):231-252.

This discussion of Dhegiha (Siouan) occupation of the eastern Plains concludes that they were relative latecomers to the region. There is considerable information on the Wichita in the general use of the term.

1994 Cultural Continuity and Discontinuity in the Southern Prairies and Cross Timbers. In *Plains Indians: A.D. 500-1500: Archaeological Cultures to Historic Groups*, edited by K. H. Schlesier, pp. 239-263. University of Oklahoma Press, Norman.

This important review of cultures in the southern Plains presents interpretations of the Great Bend aspect and

the historic Wichita, Kichai, and other groups. Vehik also provides estimations of population sizes for the Wichita, Kichai, Caddo, Osage, and Apache and information on epidemics in the wake of contact with European societies.

2002a Conflict, Trade, and Political Development on the Southern Plains. *American Antiquity* 67(1):37-64.

With Little River at its heart, Vehik takes issue with both ecological and macroeconomic models of exchange, arguing instead that exchange was politically motivated. In the face of external conflict, newly aggregated populations were governed by chiefs who employed exotic goods to accrue and maintain their authority.

2002b Topics, Themes and Theories in Little River Focus Archaeology: Research After Udden. *The Kansas Anthropologist* 23:35-44.

This paper reviews the history of research on the Little River focus since 1900, touching on issues of taxonomy, ethnic identity, origins, trade, conflict, subsistence, craft specialization, council circles, and theoretical perspectives taken on Little River focus archeology. Among the conclusions is that the Little River focus was more complex than much research would suggest.

2004 Wichita Ethnohistory and Kansas. In *Kansas Archaeology*, edited by Robert Hoard and Will Banks. University Press of Kansas, Lawrence, in press.

This is a review of the current understanding of Wichita ethnohistory with direct reference to what is now the state of Kansas.

Vehik, Susan C., and Timothy G. Baugh

1994 Prehistoric Plains Trade. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathon E. Ericson, pp. 249-274. Plenum Press, New York.

Included in this broad discussion of trade in the Great Plains from the Archaic period onward is a discussion of Great Bend aspect and related cultures. See Baugh 1984, 1991; Boszhardt 2000; Spielmann 1991a; Vehik 1990, 2002a; M. Wedel 1982; W. Wedel 1959, 1982.

W

Warhus, Mark

1997 *Another America, Native American Maps and the History of Our Land.* St. Martin's Griffin, New York.

Warhus presents a broad discussion of maps drawn by Native Americans, including a map drawn by Miguel, a Native American captured by the members of the Oñate expedition in 1601. See Newcomb and Campbell 1982; Vehik 1986.

Watt, Frank H.

1969 The Waco Indian Village and Its People. *Central Texas Archeologist* 9.

Watt discusses the history and archeology of the Waco in the Middle Brazos River valley and in the vicinity of modern-day Waco, Texas. See Newcomb 1961, 1993.

Wedel, Mildred M.

1971 J.-B. Bénard, Sieur de La Harpe: Visitor to the Wichitas in 1719. *Great Plains Journal* 10(2):37-70.

Wedel reviews the diplomatic journey by La Harpe in 1719 to a Wichita village located in present-day Oklahoma. The paper, which offers considerable information on the Wichita in the early eighteenth century, is reprinted in M. Wedel 1988. See Odell 2002.

1972 Claude-Charles Dutisné: A Review of his 1719 Journey, Part I. *Great Plains Journal* 12(1):4-25.

1973 Claude-Charles Dutisné: A Review of his 1719 Journey, Part II. *Great Plains Journal* 12(2):147-173.

This compelling essay (presented in two parts and reprinted in M. Wedel 1988) discusses the diplomatic efforts of Dutisné to a Wichita village, believed by Wedel to have been located on the Verdigris River in southeast Kansas. Wedel squeezes detail on the Wichita and their external relations from the extant documents.

1973 The Identity of La Salle's *Pana* Slave. *Plains Anthropologist* 18(61):203-217.

This detailed study of the identity of a slave boy given to La Salle in 1680 concludes that the boy was Wichita.

The essay is reprinted in M. Wedel 1988.

1979 The Ethnohistoric Approach to Plains Caddoan Origins. *Nebraska History* 60(2):183-196.

This review of Wichita, Pawnee, and Arikara ethnohistory aims at elucidating subdivisions of these groups, particularly the Wichita.

1981 *The Deer Creek Site, Oklahoma: A Wichita Indian Village Sometimes Called Fernandina, An Ethnohistorian's View*. Series in Anthropology No. 5. Oklahoma Historical Society, Oklahoma City.

This report reviews all of the historic documents in French and Spanish sources relating to the Deer Creek village in Oklahoma. Wedel concludes that it was occupied by the Wichitas early in the eighteenth century and refutes the historical tradition that it was a place called Fernandina. An edited version of this report is included in M. Wedel 1988.

1982a The Wichita Indians in the Arkansas River Basin. In *Plains Indian Studies: A Collection of Papers in Honor of John C. Ewers and Waldo R. Wedel*, edited by Douglas H. Ubelaker and Herman J. Viola, pp. 118-134. Smithsonian Contributions to Knowledge No. 30. Smithsonian Institution, Washington D.C.

A consummate ethnohistorian, Wedel summarizes Wichita culture as it can be deduced from a variety of Spanish and French documents. As with her other essays on the Wichita, this one is reprinted in M. Wedel 1988. See Gunnerson and Gunnerson 1988; Newcomb 1993, 2001; Vehik 1992.

1982b The Indian They Call *Turco*. In *Pathways to Plains Prehistory, Anthropological Perspectives on Plains Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 153-162. Oklahoma Anthropological Association Memoir No. 3 and the Cross Timbers Heritage Association Contributions No.1. Duncan, Oklahoma.

This paper presents Coronado's native guide, the Turk, as an itinerate trader, familiar with the chiefdoms of the southeastern United States.

1988 *The Wichita Indians 1541-1750: Ethnohistorical Essays*. Reprints in Anthropology No. 38. J. and L. Reprints, Lincoln, Nebraska.

This volume reprints Mildred Wedel's papers on the Wichita, which are listed separately in this bibliography.

Wedel, Waldo R.

1935 Salina 1: A Protohistoric Village in McPherson County, Kansas. *Nebraska History Magazine* 15(3):238-250.

The beginning of systematic archeology on Great Bend, this report covers the 1934 excavations at the Paint Creek site (14MP1) by the Nebraska State Historical Society.

1935 Preliminary Classification for Nebraska and Kansas Cultures. *Nebraska History Magazine* 15(3):251-255.

This is the paper that established the Smoky Hill-Great Bend aspect.

1938 Some Problems and Prospects in Kansas Prehistory. *The Kansas Historical Quarterly* 7(2):115-132.

Wedel offers a few comments on the Wichita occupation of the central Plains and external relations in the context of this wide-ranging survey of Kansas archeology as it was then understood.

1940a Culture Sequence in the Central Great Plains. *Smithsonian Miscellaneous Collections* 101(3):291-352.

Among other things, this paper offers a refinement of Great Bend cultural sequence.

1940b In Search of Coronado's "Province of Quivira". *Explorations and Field-Work of the Smithsonian Institution in 1940*. Smithsonian Institution, Washington, D.C.

This short paper is a summary of fieldwork conducted in 1940 in central and south-central Kansas. Wedel reviews artifacts and evidence of long distance exchange and very hesitantly endorses the possibility that the sites in central Kansas might represent Quivira.

1942 Archeological Remains in Central Kansas and their Possible Bearing on the Location of

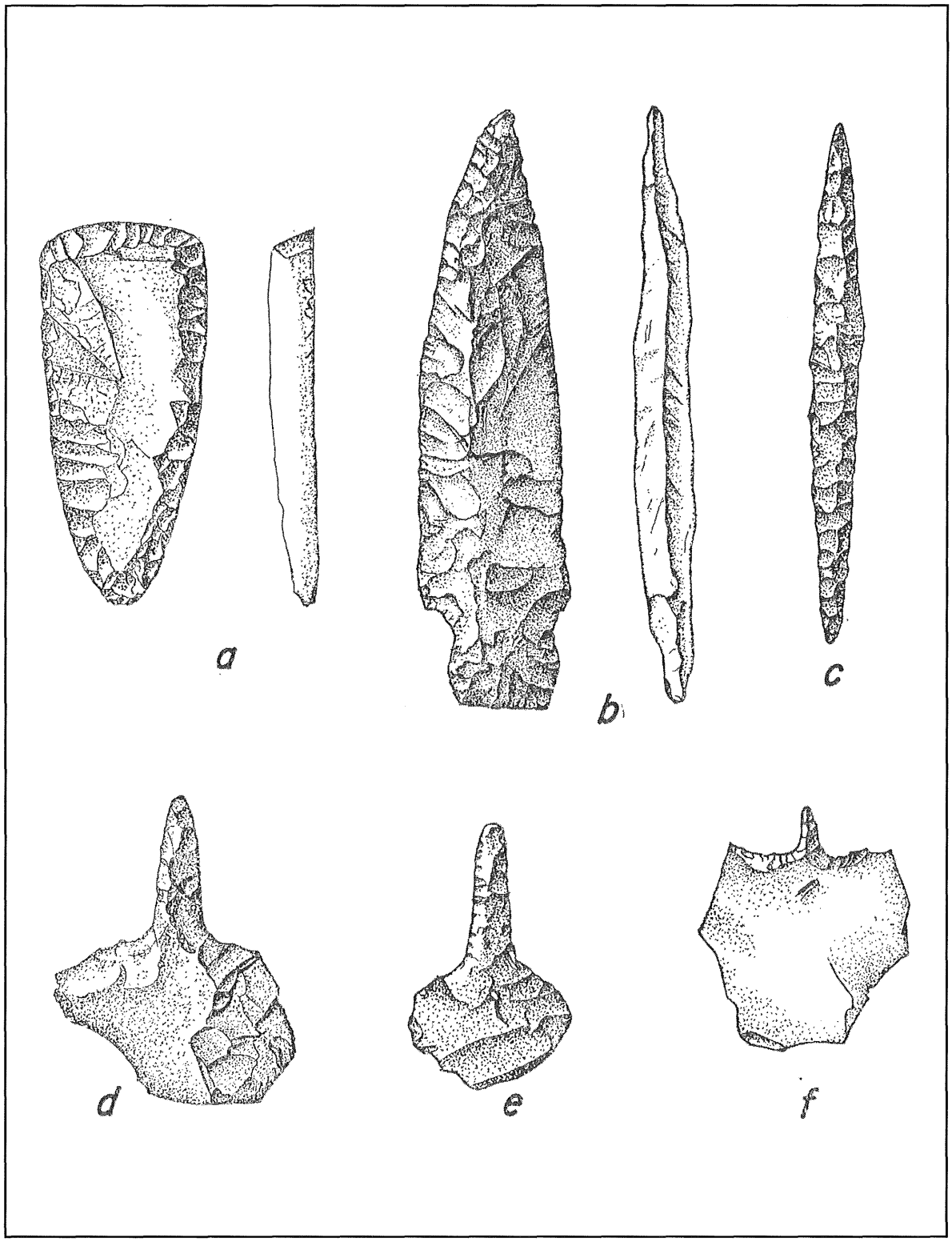

Figure 8. a) End scraper; b) stemmed knife; c) straight-shafted drill; d-f) expanded base drills, from Larcom-Haggard site. (Wedel 1959:369, Figure 72)

Quivira. *Smithsonian Miscellaneous Collections* 101(7).

This report on Smithsonian Institution investigations at sites in Rice and Cowley counties proposes that Juan de Oñate's route in the Great Plains took him to Lower Walnut focus sites.

1947 Cultural Chronology in the Central Great Plains. *American Antiquity* 12(1):148-156.

This important paper refines cultural sequences in the Central Plains; it includes additional modification of Great Bend systematics.

1949 Some Central Plains Sherd Types from Kansas. *Proceedings of the Fifth Plains Conference for Archeology*, assembled by John L. Champe, pp. 86-90. Note Book No. 1. Laboratory of Anthropology, University of Nebraska, Lincoln.

The ware and type definitions for ceramics from Little River and Lower Walnut sites are presented in this paper. See Butler and Hoffman (assemblers) 1992; Wedel 1959.

1950 Notes on Plains-Southwestern Contacts in the Light of Archaeology. In *For the Dean: Essays in Honor of Byron Cummings on his 89th Birthday, September 20, 1950,* edited by Erik K. Reed and Dale S. King, pp. 99-116. Hohokam Museums Association and the Southwestern Monuments Association, Tucson.

Wedel reviews Puebloan artifacts from Kansas sites, including those of the Great Bend aspect. Ceramics, in particular, were important for establishing chronological control of the sites.

1959 *An Introduction to Kansas Archeology.* Bureau of American Ethnology Bulletin No.174. Smithsonian Institution, Washington, D.C.

Wedel's volume includes lengthy discussions of Great Bend aspect site investigations in central and south-central Kansas and analysis of artifacts to that time (Figure 8). Wedel laid the foundations of present understanding of Great Bend, defining it and two subunits, Little River and Lower Walnut. He further discusses related sites and complexes, such as sites near Marion, Neodesha Fort, and the Pratt Complex; possible antecedent cultures; and exchange with other societies, such as the eastern Pueblos of New Mexico.

1961 *Prehistoric Man on the Great Plains.* University of Oklahoma Press, Norman.

This book is a well-written but now outdated summary of the archeology of the whole Great Plains. It offers a general discussion of Great Bend archeology as it was then understood.

1967 The Council Circles of Central Kansas: Were They Solstice Registers? *American Antiquity* 32(1):54-63.

Wedel shows that two of the council circles in Rice County are aligned with the sun at the solstice, while those in McPherson County could not have functioned in the same way.

1968a After Coronado in Quivira. *Kansas Historical Quarterly* 34(4):369-385.

This synopsis of archeology and ethnohistory of Great Bend culture, particularly Little River, contains an overview of investigations undertaken in the mid-1960s by the Smithsonian Institution.

1968b Some Thoughts on Central Plains-Southern Plains Archaeological Relationships. *Great Plains Journal* 7(2):53-62.

Wedel reviews investigations by the Smithsonian Institution-Office of Anthropology in central and southwest Kansas in the 1960s, offering comments on Great Bend antecedents, culture chronology, and exchange. The paper presents four radiocarbon dates from the Tobias site (14RC8) in central Kansas.

1970a A Shield and Spear Petroglyph from Central Kansas: Some Possible Implications. *Plains Anthropologist* 14(44):125-129.

This is a brief discussion of a petroglyph of a figure with a large shield and spear found at the Peverly Spring site (14RC10). Such shields appear to have been favored among some non-horticultural groups encountered by the Spanish in the late seventeenth century.

1970b Coronado's Route to Quivira 1541. *Plains Anthropologist* 15(49):161-168.

In this discussion of Coronado's route into the central Plains, Wedel reaffirms central Kansas as the likely terminus of the 1541 Coronado entrada.

1970c Some Environmental and Historical Factors of the Great Bend Aspect. In *Pleistocene and Recent Environments of the Central Great Plains*, edited by W. Wakefield Dort, Jr., and J. K. Jones, Jr., pp. 131-140. University Press of Kansas, Lawrence.

This review of Great Bend archeology and subsistence implicates climate change as a possible factor in the abandonment of the sites in central Kansas and movement of populations to the Arkansas River and later to the Red River.

1975 Chain Mail in Plains Archaeology. *Plains Anthropologist* 20(49):187-196.

Wedel reviews the finds to 1975 of chain mail in the central Kansas Great Bend sites, suggesting that it derives not from the Coronado entrada but most likely from the failed Bonilla and Humaña expedition of the early 1590s.

1977 Native Astronomy and the Plains Caddoans. In *Native American Astronomy*, edited by Anthony Aveni, pp. 131-145. University of Texas Press, Austin.

This review of Pawnee and Wichita star lore covers both ethnography and archeology. For the Wichita, Wedel's study focuses on the council circles as possible solstice registers. See Eddy 1978; Wedel 1967.

1979 Some Reflections on Plains Caddoan Origins. *Nebraska History* 60(2):272-293.

Concerned more with the Pawnee, Wedel does offer a few comments on the Wichita in this paper.

1982 Further Notes on Puebloan-Central Plains Contacts in Light of Archaeology. In *Pathways to Plains Prehistory, Anthropological Perspectives of Plains Natives and Their Pasts*, edited by Don G. Wyckoff and Jack L. Hofman, pp. 145-152. Oklahoma Anthropological Society Memoir No. 3 and Cross Timbers Heritage Association Contributions No. 1. Duncan, Oklahoma.

Wedel discusses Puebloan trade items, including pottery, pipes, and ground stone artifacts that came to light since his 1950 paper. Trade goods appear to show a long interaction between Wichita and eastern Puebloan societies.

1990 Coronado, Quivira and Kansas: An Archaeologist's View. *Great Plains Quarterly* 10(3):139-151.

This article reviews Wedel's long involvement with the central Kansas Great Bend aspect sites and also discusses the evidence of Spanish contact with occupants of the sites.

1994 Coronado and Quivira. In *Spain and the Plains, Myths and Realities of Spanish Exploration and Settlement on the Great Plains*, edited by Ralph H. Vigil, Frances W. Kaye, and John R. Wunder, pp. 45-66. University Press of Colorado, Niwot, Colorado.

This paper reviews evidence of Spanish contact with the Wichita of central Kansas. The paper is almost identical to Wedel 1990.

2001 Plains Village Tradition: Central. In *Plains*, edited by Raymond J. DeMallie, pp. 173-185. *Handbook of North American Indians*, vol. 13, pt. I, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

This survey of Plains Village Tradition in the central Plains includes a summary of Great Bend, which is inexplicably referred to as the Great Bend "phase."

Wedel, Waldo R., and A.T. Hill

1942 Scored Bone Artifacts of the Central Great Plains. *Proceedings of the United States National Museum* 3141(92):91-100.

This is a general review of scored bone artifacts, some of which came from Great Bend sites.

Wedel, Waldo R., and Mildred M. Wedel

1976 Wichita Archeology and Ethnohistory. In *Kansas and the West, Bicentennial Essays in Honor of Nyle H. Miller*, edited by F. R. Blackburn, E. Langsdorf, R. W. Richmond, J. W. Snell, and H. E. Socolofsky, pp. 8-20. Kansas State Historical Society, Topeka.

The Wedels review Wichita archeology and

ethnohistory—particularly in the period from 1600 to the 1750s—and conclude that cultural collapse and population reduction in the late 1700s make connecting archeology and ethnohistory difficult.

West, Judge E. P.
1880 A Buried Race in Kansas. *The Kansas City Review of Science and Industry* 4(2):86-90.

This is an early report on Great Bend sites in the Marion, Kansas, area.

Weston, Timothy, and William B. Lees
1994 History and Status of an Earthwork Known as "Neodesha Fort," Kansas. *Plains Anthropologist* 39(150):415-428.

This paper reports on Neodesha Fort (14WN1) and concludes that site disturbance has resulted in its destruction. It includes remarkable historic photographs by local oilman and amateur archeologist Thomas Galey.

Wettstaed, James R.
1987 *An Intensive Archaeological Survey of a Proposed Force Main Near Marion, Marion County, Kansas.* Department of Anthropology, Wichita State University, Wichita, Kansas.

This report on a survey in the Cottonwood River valley identifies two Great Bend sites, 14MN539 and 14MN540.

Weymouth, John, and Rob Huggins
1981 *Final Analysis of a Magnetic Survey at the Deer Creek Site (34Ka3), Kaw Lake, Oklahoma.* Submitted to U.S. Army Corps of Engineers, Tulsa District.

This report on a magnetometer survey of the Deer Creek site (34Ka3) is aimed at mapping surface and sub-surface features.

Wilcox, Ken
1981 *A Descriptive Analysis of the Pratt Ceramics.* Kansas Working Papers in Anthropology No. 6. Department of Anthropology, University of Kansas, Lawrence.

Wilcox employed a Principal Components Analysis of Pratt complex ceramics, concluding that they are more similar to Upper Republican than to later Great Bend pottery wares. See Ranney 1994; Vehik 1976.

Willits, Ramona J.
1997 Grass House. In *A Place to Call Home*, compiled by Ramona J. Willits, pp. 1-38. Popular Report No. 3. Archeology Office, Kansas State Historical Society, Topeka.

This attractive document is an educational packet on Great Bend and Wichita prepared in conjunction with the 1994 Kansas Archeology Week.

Witty, Thomas A., Jr.
1966 Larned Field School. *Kansas Anthropological Association Newsletter* 11(8):7-8.

This brief summary of the Kansas Anthropological Association field school at the Larned or Lewis site (14PA307) notes that two houses were identified and several Puebloan sherds recovered.

1977 1977 Kansas Anthropological Association Dig and Kansas Archeology Training Program. *Kansas Anthropological Association Newsletter* 22(7):1-13.

This announcement of upcoming field school in central Kansas contains comments about the Tobias site (14RC8) and the history of excavations there.

1977 The 1977 Kansas Anthropological Association Dig and Kansas Archeology Training Program, The Tobias Dig. *Kansas Anthropological Association Newsletter* 23(1):1-7.

Witty reviews the KATP dig at the Tobias site (14RC8), which focused on two low mounds. Several post molds and many artifacts of local and non-local manufacture were recovered.

1978a Plans for the 1978 Kansas Anthropological Association Dig & Kansas Archeology Training Program. *Kansas Anthropological Association Newsletter* 23(7):1-6.

This notice of field school at the Tobias site includes a brief overview of the central Kansas site.

1986 1986 Society Dig Held at C. F. Thompson Site in Rice County. *Kansas Preservation* 8(6):5-6.

This article comments on the KATP field school at the C. F. Thompson site (14RC9) where pits and two possible structures were investigated.

1992 *Archeological Investigations in the Upper Little Arkansas Watershed, Rice and McPherson Counties, Kansas.* Archeology Office, Kansas State Historical Society, Topeka. Submitted to U.S. Army Corps of Engineers, Tulsa District.

This contract report on a survey in central Kansas in proximity to numerous Great Bend sites, includes 14RC303, 14RC311, the Peverly Farm site (14RC10), and the serpent intaglio site (14RC102).

Wortman, Richard K., and Mary Ann Wortman
1996 *History of Cowley County, Kansas, Volume 1—the Beginning.* Arkansas City Historical Society, Arkansas City, Kansas.

The Wortmans provide newspaper transcripts of several late-nineteenth-century excavations in Lower Walnut sites near Arkansas City, Kansas. See Hawley 2003.

Wulfkuhle, Virginia
1993a Phase III Investigations on East Kansas Avenue in Arkansas City, Cowley County, Kansas. In *Cultural Resources Investigations for the U.S. 166 Highway Corridor*, compiled by Marlin F. Hawley, Appendix A. Contract Archeology Publication No. 11. Archeology Office, Kansas State Historical Society, Topeka.

This contract report on test investigations at several Lower Walnut sites includes the Arkansas City Country Club site (14RC3) near Arkansas City, Kansas.

1993b KATP Returns to Sharps Creek. *Kansas Preservation* 15(6):1-3.

This article reviews two seasons work at the Sharps Creek site (14MP408) in central Kansas, including excavation of part or all of seven deep storage pits with recovery of local and exotic artifacts.

Wulfkuhle, Virginia A., and Thomas A. Witty, Jr.
1992 *Archeological Reconnaissance of a Proposed LPG Pipeline Route in the Vicinity of the Little River Archeological District, Rice County, Kansas.* Submitted to Mid-America Pipeline Company. Tulsa, Oklahoma.

This short contract report of a survey in the vicinity of Little River sites in Rice County contains descriptions of artifacts found (including a sherd of non-local Caddoan pottery in a private collection) and background on Little River archeology.

Wyckoff, Donald G.
1980 *Caddoan Adaptive Strategies in the Arkansas Basin, Eastern Oklahoma.* Unpublished Ph. D. dissertation, Department of Anthropology, Washington State University, Pullman.

This is a cultural-ecological study of the Caddoan occupation of the Arkansas River basin in eastern Oklahoma. Wyckoff suggests that Great Bend society may have originated from migrations onto the Plains by some Caddoan populations.

Y

Yates, Bonnie C.
1993 Faunas from House 5 at the Vinson Site. *Bulletin of the Texas Archeological Society* 64:187-226.

The Vinson site (41LT1) in north-central Texas is a Norteño focus site. The faunal assemblage is characterized by diversity. Large game animals apparently were killed in relative proximity to the sites, based on minimal processing of the carcasses. See Smith et al. 1993.

Young, W. C.
1978 *Kaw Reservoir-the Northern Section: Part II.* Oklahoma River Basin Survey Archaeological Site Report No. 33. University of Oklahoma, Norman.

Young reports on several sites in the Kaw Reservoir basin in north-central Oklahoma; the Bryson Homestead site is a mound burial believed related to the protohistoric Wichita occupation of the area. Several other sites have Late Prehistoric (A.D. 1000-1650) components, some of which are potentially related to Lower Walnut.

Z

Zehnder, Jon P.
1998 *Relationships Between Two Little River Focus Sites in McPherson and Rice Counties of Central Kansas Based on Excavated Lithic Debitage.* Unpublished Master's the-

sis, Department of Anthropology, Wichita State University, Wichita, Kansas.

This M.A. thesis examines lithic debitage from the Tobias (14RC8) and Sharps Creek (14MP408) sites, concludes that the two village populations used distinct hunting territories, and suggests the need for a Lindsborg focus to reflect differences between Rice and McPherson County sites. See Blakeslee and Hawley 2004a,2004b; Vehik 2002b.

Zimmerman, Mark E.
1928 Circular Shrines in Quivira and the Jehovah of the Ohio Mound Builders. *Kansas Historical Collections, 1926-1928* 17:547-557.

This is an eccentric appraisal of the so-called "council circles" in Rice County.

Zimmerman, Mark E., and Edward Park
1931 An Archaeological Survey and Investigation of Old Indian Village Sites in Rice County, Kansas. In *Twenty-Sixth Biennial Report of the Board of Directors of the Kansas State Historical Society*, pp. 12-20. Topeka.

This is an account of survey and excavations in several low mounds and storage pits in Rice County. See H. Jones 1928; P. Jones 1928; Ross 1928.

Acknowledgments. We gratefully acknowledge the encouragement, comments, and assistance of Timothy Perttula, Susan Vehik, George Odell, and Sam Wilson. Virginia Wulfkuhle and Martin Stein deserve special thanks for tracking down information from numerous CRM reports and early Kansas Anthropological Association documents.

NOTES

Book Reviews

Telling Stories the Kiowa Way

Telling Stories the Kiowa Way. GUS PALMER, JR. University of Arizona Press, Tucson, 2003. xxx + 146 pp., pronunciation guide for Kiowa, appendix, notes, works cited, index. Cloth $35.00 ISBN 0-8165-2277-4; paper $17.95 ISBN 0-8165-2278-2. *Reviewed by* Jim D. Feagins.

Telling Stories the Kiowa Way is a collaborative ethnography, a cooperative effort between Kiowa elders and Gus Palmer, Jr., himself an anthropologist and a Kiowa. Palmer grew up hearing Kiowa stories from his grandfather, Henry Tanedooah, and other tribal members and relations. However, it was not until recent years that he started analyzing the nature of Kiowa stories and how they were told.

Palmer, an assistant professor of anthropology at the University of Oklahoma, is interested in keeping the ancient Kiowa storytelling tradition alive and in helping to save the endangered language of this important Plains Indian tribe. As an insider and active participant, he describes in a very personal way the essences of Kiowa storytelling. It is important to know when and how to tell stories. Listener participation is an important component. Palmer describes telling stories within stories and fitting old stories into new stories and new contexts. He describes Kiowa humor—the teasing, joking, and telling fibs—and how much of this humor is best presented and sometimes can only be fully understood when spoken in the Kiowa language.

Palmer indicates that many of the previously published Kiowa tales, stories, and myths contained errors or were embellished with incorrect interpretations by earlier anthropologists. These past researchers would have benefited by having a better understanding of the nature of Kiowa storytelling and by spending more time with individual Kiowa storytellers. More relaxed but careful fieldwork would have been advantageous.

This book also includes background on the Kiowa and on a few selected Kiowa texts. Not surprisingly, storytelling—along with everyday conversation—is the means by which Kiowa cultural values and beliefs are passed on to new generations. These stories remain an important part of the Kiowa culture. The Kiowa pronunciation guide will be of value to some readers, especially those interested in the Kiowa language. In general *Telling Stories the Kiowa Way* will be of interest to the Kiowa people, anthropologists, and those simply wanting to gain a better understanding of the nature of storytelling by one of Native America's more colorful tribes.

This volume may be obtained through your local bookstore or from the University of Arizona Press, 355 S. Euclid, Suite 103, Tucson, Arizona 85719-6654. The web site is www.uapress.arizona.edu.

Plains Indian Rock Art

Plains Indian Rock Art. JAMES D. KEYSER and MICHAEL A. KLASSEN. University of Washington Press, Seattle and UBC Press, Vancouver, 2001. $24.95 (paper). ISBN 0-295-98094-X. *Reviewed by* Jim D. Feagins.

Petroglyphs and pictographs, collectively called rock art, have long held a fascination to modern people who found them many years or even centuries later. Undoubtedly there are many reasons for this fascination, but perhaps the best is that they inspire a feeling of connection between us and individuals from long-ago cultures. Ideas and beliefs from the past, represented by carvings or paintings on stone, remain for our study and interpretation. As the authors state, "Rock art ... is one of those rare archaeological artifacts whose form, structure, and location derive almost solely from the inner mind of its maker" (p. ix).

However, while rock art sites have long been of interest, mainly as curiosities, professional archeologists generally have shied away from their serious study, that is until more recent decades. Many have long believed that it was almost impossible to confirm various rock art interpretations, and there would not be much individual advancement in the profession if the best that one could do with rock art studies was to generate weakly supported speculations. That type of thinking has been changing with more comparative studies of rock art sites, improved rock art taxonomy, advancements in scientific technology useful for rock art studies, and increased usage of ethnographic information.

The volume's title, *Plains Indian Rock Art*, implies that rock art will be described from all over the Great Plains. However, the title is misleading, as

the rock art from the northeastern, southern, and central areas of the plains region is essentially ignored. The authors focus only on the geographic area for which they are most expert—from northern Colorado to Alberta and from the Rockies to the western Dakotas. In spite of this limitation, archeologists working in the remainder of the plains can obtain much useful comparative rock art information from this volume. Keyser and Klassen state, "Although we know the northern Plains rock art best, we believe that the descriptions and interpretations in this book can be applied equally to much in the southern region" (p. vii).

The region's native tribes and archeological cultural history are described in two well-written chapters. Thus, a background is presented for a better cultural understanding of the rock art. The Northwestern Plains–the land of the Sioux, Crow, Cheyenne, Arapaho, Blackfoot, and other tribes–contain rock art representing a long history, hunting ceremonies, religions, and other cultural aspects from a diverse and undoubtedly colorful people extending back in time for thousands of years. The authors state that more than 90 percent of the rock art in this region is of prehistoric origin.

The history of rock art studies and the methods utilized are presented. Of special interest are the sections on various ways rock art can be interpreted. Keyser and Klassen note the close relationship between rock art and sacred landscapes. They discuss six ways that rock art can be dated: association with dated archeological deposits, similarities with dated portable art, portrayal of datable subject matter, superimposition of designs, patination and weathering, and chronometric dating. The latter category is concerned with ways for directly dating the rock art itself, i.e., accelerator mass spectrometry (ASM) radiocarbon dating and cation ratio (CR) dating. In the case of rock art, both methods are still somewhat problematic.

The heart of the publication is concerned with various traditions of rock and, in one case, other Native American art in the region. A chapter is devoted to each of the 11 traditions presented; these traditions (or stylistic relationships) include: Early Hunting, Columbia Plateau, Dinwoody, En Toto Pecked, Pecked Abstract, Foothills Abstract, Hoofprint, Ceremonial, Biographic, Robe and Ledger Art, and Vertical Series. Each chapter contains a map showing the location where a particular tradition of rock art is found. From an artistic and interpretive standpoint, the Dinwoody tradition is among the most unique to this reviewer, in spite of having observed it in the Southwest. Some of the Early Hunting tradition rock art may date as far back as 7,000 years ago. Much later in time is the intriguing Vertical Series tradition. The authors suggest the possibility that this tradition represents a type of ideographic writing. To date, little research has been conducted on sites of this tradition in the Northwestern Plains. Of course, the Ceremonial and the Biographic traditions are common but interesting and extend over a wide geographic region. Readers familiar with Kansas and other Central Plains rock art will note many similarities with quite a few of the traditions described by Keyser and Klassen.

One tradition included by the authors is primarily based on the materials on which the drawings are rendered—the Robe and Ledger Art tradition. By definition this tradition is not rock art at all. However, it is most appropriate to include this chapter on "robe art" (images painted on objects and clothing made of hide or cloth) and "ledger art" (images painted or drawn on paper) for comparison with the area's petroglyphs and pictographs. The authors have written an excellent chapter on the subject. Robe and Ledger Art has and continues to provide much useful information to aid in dating and interpreting rock art.

Scattered among the chapters are several somewhat independent case studies concerned with the interpretation of specific sites or specific subjects. A few examples of these interpretive studies are War Bridles and Otter Bundles; Superimpositioning at a North Cave Hills Site; Medicine Rocks; Bear Power, Bear Dreamers; Counting Coup at Crossfield Coulee; Saahkomappi and the Big Dogs; "All Kinds of Spirits Dwell Up There;" and The Battle Scene. These minisections of interpretive studies add interest to an already interesting volume.

The authors devote one chapter to "Sites Developed for the Public." The rock art sites available for viewing by the general public are described according to state or Canadian province. Of course, rock art site protection, respect for private and public landowners, and a consideration for the spiritual beliefs of Native Americans are extremely important visitor ethics.

Plains Indian Rock Art is a well-written volume on a subject that is clearly "near and dear" to Keyser and Klassen. Even though the volume is specifically concerned with the Northwestern Plains, there is much to recommend it to researchers and the general public interested in rock art from adjacent areas, including the remainder of the Great Plains. A great many of the rock art styles or traditions described by the authors are also found southward. This volume is quite worthy of space in one's library. It may be obtained from your local book vender or from the University of Washington Press, P. O. Box 50096, Seattle, Washington 98145-5096; online at www.washington.edu/uwpress/.

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Feagins' primary area of research interest is in the prehistory of the eastern Central Plains. He is especially interested in evidences of trading during the Late Prehistoric and early Historic periods, cultural resource management, ledger art, and ceramic technology.

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Marlin Hawley is a native Kansan, now living in Wisconsin. He and his wife Amy have a son Benjamin, who started to first grade this fall, and a two-year-old daughter Rachel. The family has no pets, but Marlin once caught a 13-pound king salmon in Little Traverse Bay. He is a member of the KAA, a regular contributor to KAA publications, and served as guest editor of Volume 23 of *The Kansas Anthropologist*. He is senior archeologist for the Museum Archaeology Program, State Historical Society of Wisconsin.

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Brad Logan (M.A., University of Nevada-Reno, 1977; Ph.D., University of Kansas, 1985) is a research associate professor at Kansas State University. From 1985 to 2003, he was director of the Office of Archaeological Research at the Museum of Anthropology, University of Kansas. He has archeological experience in the Great Plains, Rocky Mountains, and Great Basin, as well as in southern France and central Austria. A native of Clay Center, Kansas, he is a member of the KAA and recipient of the KAA Certificate of Appreciation in 2003.

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Harold Reed was born in Salina, Kansas, and lived there all his life except for four years of service in the U.S. Air Force. He has always been interested in Kansas history and became involved in the KAA and Kansas archeology in 1967. He and his wife Margie have attended most of the KAA field schools (even before the Kansas Archeology Training Program) and have enjoyed working in various field positions. They both completed all of the requirements for certification in 1997. Harold is also a life member of the Kansas State Historical Society.

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Roper is heavily engaged in research on several aspects of Middle and Late Ceramic period prehistory in Kansas and Nebraska. Among her current projects, she is completing a detailed analysis of the Salina Burial Pit; to put this work in perspective, she has been working with collections from the Smoky Hill phase living sites. She seeks to understand the lifeways of those who were interred in the burial pit cemetery and in broader perspective how lifeways in central Kansas at that time compared and contrasted with those of their contemporaries on the edge of the High Plains to the west. She has been a KAA member for over a decade.

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Wilson-Agin received a B.A. degree in archeology from the University of Kansas in 2000. In summer 2003 she earned a M.S. degree in earth science with an emphasis in geophysics from Emporia State University. Her master's thesis research focused on determining the feasibility of locating unmarked graves in Kansas soils with geophysical technology. She plans to enter a Ph.D. program at the University of Arkansas in Fayetteville. Her dissertation research will undertake a more in-depth project to develop a set of geophysical techniques that can successfully identify and locate both archeological sites and unmarked graves throughout the Midwest, despite soil conditions that yield ambiguous geophysical data.

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NOTES

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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.

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