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The KANSAS Anthropologist
Journal of the Kansas Anthropological Association

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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In 1998 members will receive at least four issues of the *Kansas Anthropological Association Newsletter* (ISSN 1069-0360) and one journal, *The Kansas Anthropologist* (ISSN 1069-0379). They will 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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Wm. Duncan Strong and Nebraska Archeology in the 1930s

Waldo R. Wedel
Smithsonian Institution

Kansas Anthropologist 19:1–6

William Duncan Strong (1899-1962) taught at the University of Nebraska from 1929 to 1931 and made a lasting impression on Nebraska and Plains archeology. This paper, originally presented at the 50th Plains Anthropological Conference in Lincoln, Nebraska, on November 12, 1992, offers a few recollections, archeological and non-archeological, of Nebraska archeology during Strong's brief stay in Nebraska. It recalls something of the atmosphere in which archeology and certain other activities were carried on and what Strong was up against.

In another place I have recorded some of my recollections and impressions of Duncan Strong during the Nebraska days, as I recall them from my brief years of association with him professionally in Nebraska and in Nebraska archeology (Wedel 1977, 1981, 1982) and from subsequent contacts with him in California and in Washington.

When Strong arrived at the University of Nebraska in Lincoln in the summer of 1929, he quickly befriended several other young faculty members who were equally restive under some of the constraints and restrictions of the academic life. These included John D. Hicks and Bob Reynolds in the history department and others in political science and various liberal arts departments. When and as circumstances permitted, these men lunched together and sometimes partied at one another's houses. Here there were opportunities for Strong to voice his irritations over a Teacher's College memo requesting a list of the books he was planning to use as text and library references ("What the hell do they know about Anthropology?"), and he could complain about the seeming futility of seeking lab space for processing collections.

In 1929 these students launched a mimeographed campus news sheet, provocatively titled "With Fire and Sword." Contributing to this organ was what some called investigative reporting of high quality; to others it was yellow journalism of the most reprehensible sort. Among its many readers, who included both students and faculty, it was widely held that at least one administrative personnel change at a high level resulted from certain disclosures involving vehicle purchases by the university. At irregular and unpredictable intervals, stacks of the sheet appeared at various points around the campus and at fast-food establishments, barber shops, and the like as far from the campus as O Street, usually preceded by carefully planted rumors as to where copies could be picked up.

In 1930 a Pinkerton detective was brought into the case in a determined attempt by the university to track down the perpetrators. He stayed for several weeks at one of the better hotels in Lincoln, but was no more successful than the university administrators had been. It was a tribute to the skillful planning and modus operandi of the students responsible that, while their identities were mostly well known, confirming evidence that would provide a basis for disciplinary action was conspicuously absent. By putting their own "tail" from Russian Bottoms on the detective and keeping posted on his whereabouts, the students were able to stay well out of his clutches.

Duncan Strong's only involvements in "With Fire and Sword" were indirect. The detective took one obvious approach by instituting a check of the typewriters in the social science building, including those in Room 202, which Strong shared, and those in the offices of other young Turks in the professorial ranks. This check provided no useful clues, though it did take in most or all of the machines used in preparing the master copy for duplicating. What it couldn't disclose was the fact that the master copy had been composed on a typewriter whose keyboard had been made up from parts of several machines and that this keyboard was afterward disassembled and the keys returned to their original typewriters.

On one occasion word reached the detective and/or the administration that another edition of the sheet was about to be released for distribution from an address on Arapahoe Street, which chanced to be the home of Duncan and Jean Strong. The detective, I was told, waited through a good part of a dark and

stormy night in a weedy vacant lot across the street for the delivery, while Strong and a number of his faculty and graduate student friends regaled themselves indoors with reading from *John Brown's Body* by Stephen Vincent Benét and quaffing beer.

In the field Strong was singularly stimulating and effective. I was with him during the summer of 1930, headed his field party in 1931 while he moved from Lincoln to Washington, and was a member of his 1932 expedition for the Bureau of American Ethnology at Signal Butte and the Leavenworth site. In all of these, the work was done from a tent camp and usually by a relatively small party. The fare was often lean but always adequate, and there were few frills (Figure 1). Strong did his share of the most unrewarding and soul-trying exercise in field archeology, backfilling the excavations by hand.

When heavy or protracted rains held us in camp during normal working hours, and after notes, records, accounts, and shopping lists were complete, Strong was always ready to while away the remaining time with stories of his experiences among the Indians of southern California and the Southwest, or drinking tea and eating moose meat with the Naskapi in Labrador (Leacock and Rothschild 1994), or on a World War I destroyer doing escort service across the Atlantic.

At the Hill site in 1930 (Figure 2), he stood with A. T. Hill and me on the burial hill immediately to the south from which Lt. Zebulon M. Pike in 1806 had first looked down at the Republican Pawnee village on the river terrace below. He recalled with an obvious thrill of pleasure the spectacle of Pike and his little band, weapons at the ready and prepared to fight to the death if Pike drew his sword, facing down the massed military might of the Pawnee warriors, bows strung, who threatened to bar the Americans' progress past the village.

Strong's work in Nebraska archeology ruffled a few feathers, professional and otherwise. I have already noted his ongoing difficulty in getting adequate laboratory quarters in a building so long dedicated to paleontological rather than archeological research. There were other problems. In his first year at the Bureau of American Ethnology, as Archaeological Minute Man for Science Service, Strong provided an analysis and evaluation of recent discoveries of artifacts associated with extinct animals in Nebraska (Strong 1932). At two of these finds, he was inclined to accept the claimed associations — Cumro in Custer County and the Meserve bison quarry in Hall County. In both instances the initial discoveries involved specimens that were not seen in situ by professional observers.

The third site was the Angus mammoth in Nuckolls County. Here the *Hastings Daily Tribune* on August 20, 1931, reported the discovery by A. M. Brookings of the Hastings Museum of a "Folsom type arrowpoint" beneath the scapula of a Columbian

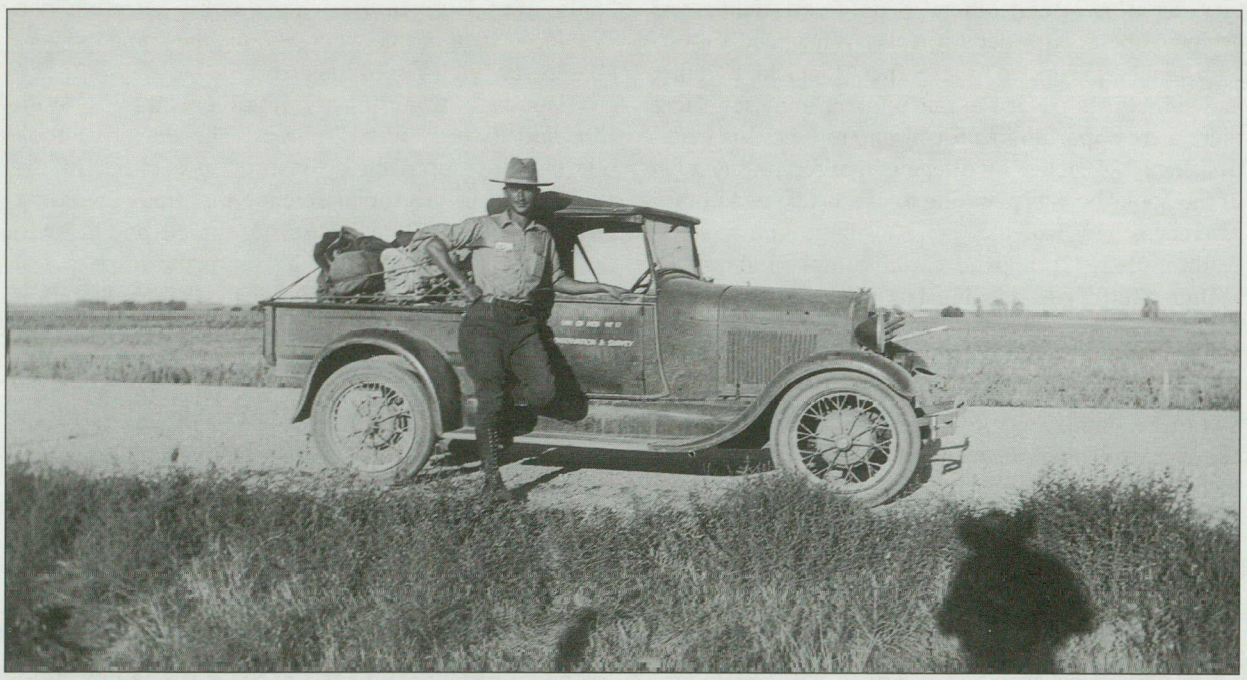


Figure 1. Waldo R. Wedel with University of Nebraska Conservation and Survey truck, ca. 1931.

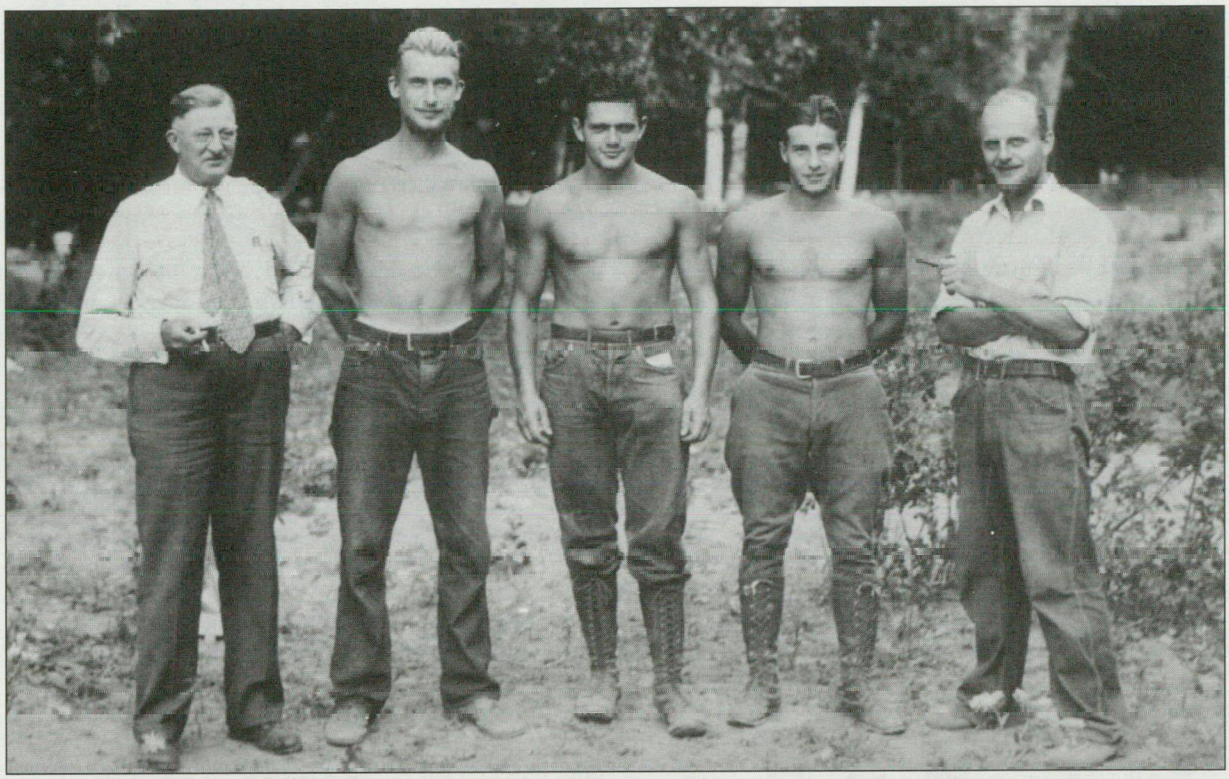


Figure 2. A. T. Hill, Waldo R. Wedel, Michael O'Heeron, Frank Morrison, W. D. Strong, the field crew of the University of Nebraska Archeological Survey in camp at the Hill Pawnee site, Webster County, Nebraska, August 1930. Photo (catalogue number RG3562, Group 4, Photo 4) is reproduced with the permission of the Nebraska State Historical Society.

mammoth. On Friday, August 21, Strong, A. T. Hill, Michael O'Heeron, and I visited the site. Present also was J. D. Figgins, Director of the Colorado Museum of Natural History in Denver, which had just taken charge of the work of excavation. We were shown the point that had been turned over to Figgins for deposit and preservation in the Colorado Museum. We were then allowed a close look at the find spot and told about the circumstances. In Strong's words:

> The chipped point was found under the horizontal scapula, the point itself being at right angles to the plane of the scapula and the silt layers in which it occurred. It was encountered by Junior Brooks while digging a tunnel under the shoulder blade for binding it prior to removal. The latter, on striking the artifact, called Mr. Brooking who immediately dug out and removed the point.

(These statements were made to the author, August 21, 1931. Also see *Daily Tribune*, Hastings, Nebraska, Thursday, August 20, 1931. Figgins 1931:23, however, states that the artifact was removed before its nature was discovered, presumably by Brooks.)

> At the time of my visit, August 21, all the immediate matrix material from which the point had been taken had already been removed and the hole under the scapula was being enlarged by Mr. Brooking at that time. Mr. Brooking stated that he was so unprepared for such a find that, when his assistant reported striking a hard object in the silt, he never thought of leaving it in situ or afterward of preserving the imprint from which it came. Since Mr. Brooking was obviously aware of the Folsom finds, to the best of my knowledge was also aware of the recent Nebraska discoveries of Mr. Schultz, and, only a few days before, had questioned Mr. A. T. Hill regarding the possibility of human workmanship on a smooth, red, waterworn boulder found near the mammoth bones, this complete destruction of all secondary evidence seems strange.

On July 11 Figgins wrote Strong, taking exception to some of the latter's remarks and particularly to the paragraph quoted above. Thus,

> I personally interpret that section of your report as something more than a suggestion that Mr. Brooking may have introduced the artifact and then willfully destroyed all "secondary evidence" . . . as you must have substantial grounds to support the conveyed impression that Mr. Brooking may have practiced a fraud, you will doubtless appreciate my further interest.

To this Strong replied on July 23, 1932, from his field camp at the Leavenworth Arikara site near Mobridge, South Dakota, in part:

> The statement in the Science Service report to which you refer has no implications beyond those explicitly stated. To me, the fact that within 24 hours all traces of the contact area or immediate matrix around the artifact at Angus had been removed by a man of Brooking's collecting experience does seem strange. The fact that you were due the next morning, and that he knew I was close at hand and would gladly come to examine a find of such seeming importance makes this especially true . . . . I also find it strange that the account of the discovery given to you and corroborated by Brooking should differ from that given to the *Hastings Tribune* reporter the day before and to myself in the presence of three witnesses the day after . . . . Since the Colorado Museum has for some time cooperated with Mr. Brooking in scientific work, as you state, and as you have already endorsed his integrity in scientific matters, I feel that you must have already satisfied yourself in this regard.

The exchange of letters ended with Figgins' reply on August 10 in which he implied that Strong's doubts were baseless and disavowed that the Colorado Museum had "cooperated with Mr. Brooking in scientific work" or had "already endorsed his integrity in scientific matters." He registered other points of difference with Strong's expressed views and apparently remained unconvinced that the alleged man-mammoth association at Angus was heavily clouded by unanswered and unanswerable questions. Subsequent developments have done nothing to weaken Strong's arguments or to strengthen Figgins' position.

Strong's (1933, 1935) operations at Signal Butte, which he had been invited to undertake by Thomas L. Green, a Scottsbluff banker, were also distasteful to Figgins and his associates. In the presence of Green, Figgins argued in private that at the first Plains Conference in Vermillion, South Dakota, in 1930, western Nebraska had been "assigned" to Dr. E. B. Renaud for archeological exploration. Strong and his crew from the Bureau of American Ethnology and the Laboratory of Anthropology in Santa Fe were regarded as interlopers and trespassers. In a spirited defense of Strong's right to work at Signal Butte, Green pointed out that he had been directly and personally responsible for initiation of the BAE dig at the site, that any further work there would be under Strong's direction and with his consent, and that if necessary he (Green) would personally enlist the landowner's support in closing both Signal Butte and the nearby bison quarry to further organizational investigation if someone not of Strong's choosing were to try to carry on serious digging on the butte. He noted further that Strong had been at Vermillion, that no exclusive territories had been assigned to anyone, and that the institutional investigators from Colorado and their western Nebraska supporters had known nothing of Signal Butte and its archeological potential until Strong's preliminary work there began in 1930 at Tom Green's urging.

While it can be correctly argued that the backbiting and malicious gossip that took place here were by no means unique in American science, the performance reflects no credit on the participants, most of whom have passed to their reward.

Signal Butte has left other memories for its survivors, beyond the ceaseless winds, the dust, and other natural phenomena. Two of these concern our top shovel hand and camp manager, Mike O'Heeron. Mike had a fondness for hard work, especially with pick and shovels, and he believed in giving full measure of service. As our excavations on the butte went forward, it became clear to us that we needed to have more details regarding the stratigraphy of the soil cap on the main Wildcat escarpment a few hundred yards south of the outlier butte. To this end Mike was sent to the escarpment with instructions to dig a 5- by 12- foot test trench to the caprock. He spurned Strong's offer of a helper; "I work fastest by myself," he explained. All day long Mike worked furiously, for once untrammeled by the need to be on the alert for specimens or other features. As the afternoon wore on, Mike was no longer visible from the butte, though flying shovelfuls of dirt could be seen above the rising dirt heaps. At quitting time the crew from the butte gathered at the truck, but there was no sign of Mike. Finally, worried that some accident might have befallen him, Strong and I climbed the escarpment to check. We found

Mike sitting and resting quietly on a small banquette, his feet on the caprock underlying the soil, and his assignment finished. As usual, he had consistently undercut his trench walls so that the pit was larger in floor area than at the ground surface, and he had left no steps or footholds by which to get out. We had to call for a rope from the truck to liberate him.

The 1932 field party at Signal Butte and Leavenworth included four students on Laboratory of Anthropology fellowships, and the Laboratory had furnished a station wagon to the expedition to help with transportation in the field. When work at Leavenworth terminated in late summer, Mike volunteered to drive the station wagon back to Santa Fe on his way home to Texas. He routed himself through the Black Hills and through Scottsbluff. Here he had an additional charge from Strong to dig a small test trench on Signal Butte and make a few good photos of the stratification at that point. What followed is best recounted in Tom Green's 10-page handwritten letter of October 20:

> The Sunday Mike went to the Butte with [Ray] Swanson he wanted me to come out and see their trench. I had other business but said I would try to be out there late in the afternoon. About 5:30, about two miles from the Butte, Ethel [Mrs. Green] and I met Mike, Swanson, and a boy hitch hiker whom Mike brought down from the Black Hills, returning from the Butte. Mike insisted on going back and showing me their trench. I demurred but finally consented. As we approached the Butte we saw Mat B & his wife coming off the Butte, & they drove away as we drove up. When we arrived at the trench we found the sides dug out & dirt thrown in. Mike was furious and outraged. Explaining that nobody could treat "Smithsonian property" that way, and [he] was going to punch him, he started on a dead run down the Butte. I called and yelled for him to come back but could not stop him until he started to get into the truck to go in pursuit. Then I got his attention and insisted on his coming back: That it would cause trouble, etc. Reluctantly he came back to the top and we spent several minutes talking & examining the trench. When we got to the foot of the Butte, Mike noticed that B had stopped down on the [Kiowa] creek and was shooting his bow. Mike insisted on going to him and talking to him & telling him what he thought of him. I insisted on his staying with us & Mike begged to go & said, "I promise you I won't lay a finger on him." I still told him not to go. But I did think B needed talking to, and possibly my voice was not as emphatic as it had been. Also I was possibly affected by Mike's promise not to fight, and while I still said don't go, I may not have said it so loud. When B saw Mike coming, or at least when Mike started, B at once got into his car & started home.
>
> I suppose the excitement of the chase got into Mike's blood because he kept right on after him, both car and truck at high speed. I did not think Mike would keep after him & so did not hurry at first but realizing Mike was trying to catch him, I then drove as fast as I could. But when I got over Roubideaux Pass, I met Mike coming back right by Oberlander's house. Mike told me the story, corroborated by the hitch hiker. He overtook B, drove across the road & stopped him, got out & demanded what he meant by destroying a Smithsonian trench. B denied it, Mrs. B said she did it. Then B said he did it. Mike said something about hiding behind a woman's skirt. Mrs. B said Mike was no gentleman. Mike said, "Lady, I don't pretend to be." A few more words passed and B called Mike a name. Then Mike gave him one in the jaw making him spit blood. Then B pulled a gun. Mike jumped in front of the car where he couldn't be hit through the windshield. Mrs. B got possession of the gun, and Mike came back to [the] side of the car. A few more words passed. B threatened to report him to the Smithsonian. Mike told B some more what he thought of him. B said he couldn't stand that & got out of the car. Mike made for him and B jumped back into the car and drove off. Mike was terribly disturbed and ashamed. He seemed particularly worried because he had broken his word to me, "not to lay a finger on him . . . ."
>
> I think Mike had very great provocation. All his ideas of propriety, sportsmanship were outraged. And while terrified at what might have happened to Mike, I got some pleasure out of the fact that Mr. B was hit (seeing that he had to be hit) hard enough to have him spitting blood, though Mike assured me he didn't hit him very hard . . . .

On September 12, Mike had reported to Strong his arrival in Waco and briefly acknowledged the

unpleasantness at Signal Butte. On October 12, probably because of prompting by Green, he wrote Strong again from Dallas, where he was furthering his preparation for a distinguished professional career in urology, and included a longer account of the fight, which we shall not report here but which confirms the Green account.

More than 50 years have passed since that afternoon in early June of 1930, when I stepped off the bus in Lincoln and first met Duncan Strong. Less than two months later I met A. T. Hill. It was my great privilege to share the friendship and close working relationship that developed between these two remarkable personalities, one a trained and thoroughly professional anthropologist and the other a self-trained businessman turned into a student of archeology. Much has happened in the years since — in Lincoln, at the University of Nebraska, and in Plains archeology generally. The indispensable role of archeology in correcting the misconceptions about pre-white Plains culture history derived from ethnological studies has been convincingly demonstrated. We know now that the environment did not prevent human occupation before the horse was introduced.

Inevitably, as my thoughts travel back through the years, I am led to wonder at this point what might have been the course of archeology at Lincoln, and indeed in the Great Plains, had Strong resisted the blandishments of the Bureau of American Ethnology and the implicit approval of his mentor at Berkeley, Professor A. L. Kroeber, and elected to stay on at the University of Nebraska. But whatever, he, like A. T. Hill, has left a deep and lasting impression on the field, and that is surely accomplishment enough.

Editor's note: The cooperation of Waldo M. "Wally" Wedel, son of Waldo and Mildred Wedel, is gratefully acknowledged. He provided the text of this paper and the previously unpublished photograph of Dr. Wedel. He read this paper for his father as part of a Special Retrospective Session, chaired by W. Raymond Wood, at the 1992 Plains Anthropological Conference.

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Cultural Resource Investigations at the Lower Cimarron (Wagon Bed) Spring Camp Site (14GT101), Grant County, Kansas

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The Kansas Anthropologist 19:7–35

Lower Cimarron Spring (14GT101) was designated as a National Historic Landmark (NHL) in 1960 under the name Wagon Bed Springs. The present project was conducted in order to better identify the actual boundary of the NHL and to clarify the historic location of the spring. On August 6, 1998, as a result of this project, Secretary of Interior Bruce Babbitt approved changing the name of the NHL to "Lower Cimarron Spring." He also approved the expansion of the NHL boundary to include the historic campground associated with the spring. Located in southwestern Kansas, the Lower Cimarron Spring NHL is a historical archeological site that encompasses approximately 195 acres in an agricultural area about 12 miles south of the farming community of Ulysses in Grant County, Kansas. The site includes the Lower Cimarron Spring, which is now dry, its associated campground, and several remnants of the Santa Fe Trail. The Cimarron River formed a natural boundary for the historic camping area associated with the spring, and archeological investigations have revealed a high concentration of Santa Fe Trail-related artifacts within the site boundary.

Introduction

In 1993 the Southwest Regional Office of the National Park Service requested that the Rocky Mountain Regional Office undertake a boundary study of the Wagon Bed Springs National Historic Landmark (NHL), which is located in Grant County, Kansas (Whitacre et al. 1994). The Secretary of the Interior designated Wagon Bed Springs as a NHL in 1960 because of the site's association with the Santa Fe Trail (Mendinghall 1960). In recent years the NHL had become a source of considerable controversy, as the local chapter of the Santa Fe Trail Association disagreed with the landmark boundary designated in 1960. In 1989 the Wagon Bed Springs Chapter of the Santa Fe Trail Association relocated the NHL plaque to a new location approximately one-quarter mile north of the NPS-designated site. The Southwest Regional Office of the National Park Service, which is responsible for managing the Santa Fe National Historic Trail, funded the NHL study in an effort to ascertain the actual location of the spring, to resolve the boundary controversy, and to consider, in light of recent archeological discoveries in the area, the expansion of the NHL boundary to include the historic camp site associated with the spring. Congress designated the Santa Fe Trail, including both the Mountain and Cimarron Routes, as a National Historic Trail in 1987 (Figure 1).

The locations of historic trails and trail-related sites often prove elusive to modern researchers. Trails that once may have been well-defined paths become obliterated through erosion, highway and building construction, and crop cultivation. Rivers change course, flooding alters the landscape, and natural and cultural landmarks that once marked the trails disappear. Also, trail travelers never followed just one path. Depending on weather and soil conditions, the formation of the wagon caravans, the need to find water and forage, and the ever-present desire to find a better or shorter path, Santa Fe Trail travelers created numerous trail routes and variations, which could be several yards or even miles apart. In addition, the journals and diaries of Santa Fe Trail travelers often provide only sketchy and/or contradictory information regarding the locations of trails and camping sites.

In the case of the Lower Cimarron Spring, the task of finding the historic location was made all the more difficult because it is no longer a running spring. In 1914, a flood destroyed the spring site and greatly altered the Cimarron River channel bed in the vicinity of the spring. In addition, deep-well pump irrigation had dramatically lowered the water table and eliminated all possibility of the spring running

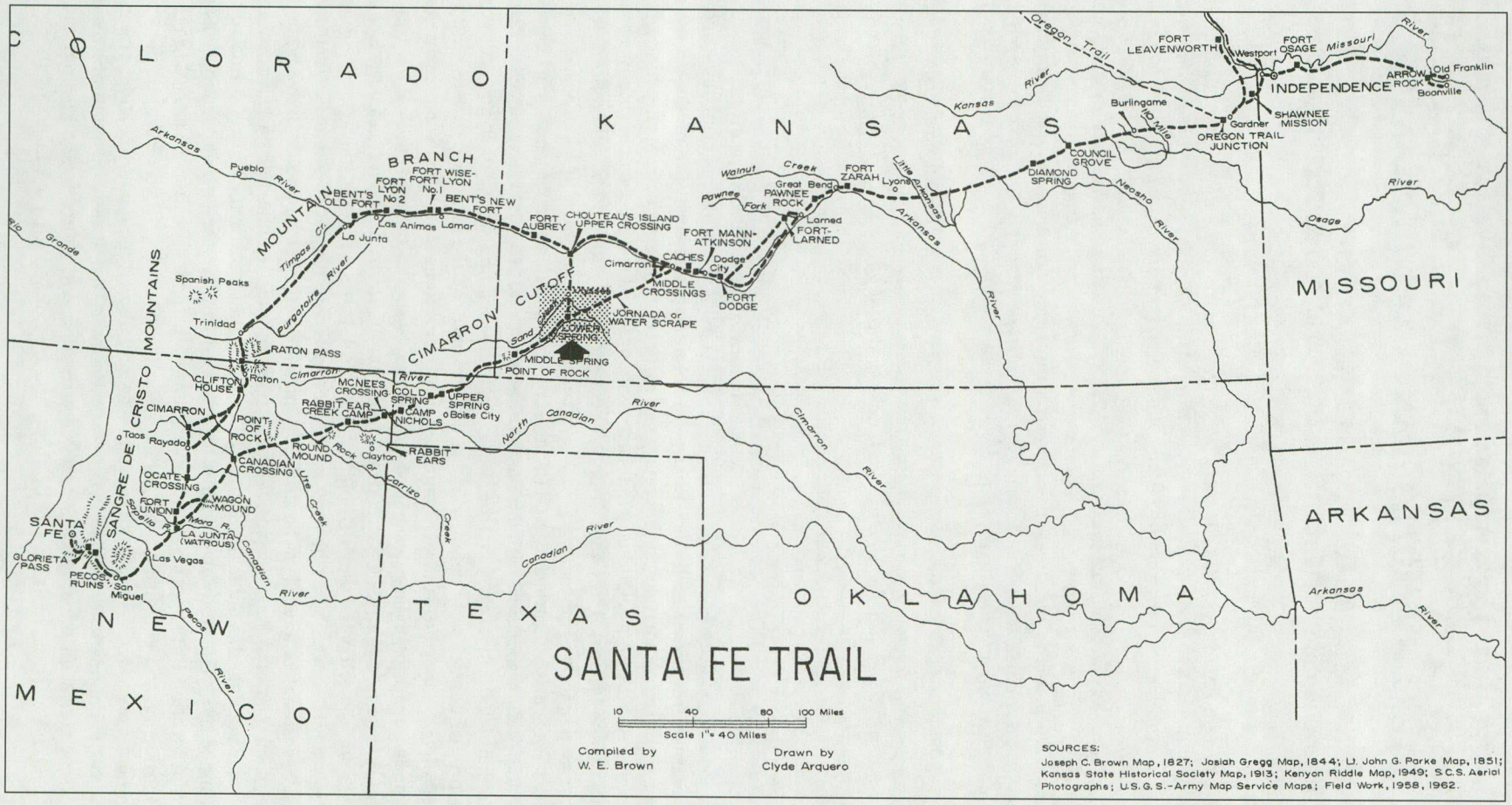


Figure 1. The route of the Santa Fe Trail (adapted from National Park Service 1963:1-I).

again. Since the spring is no longer extant, the National Park Service drew upon a variety of sources for information relating to the spring's historic location. These sources included published histories of the trail, the accounts of Santa Fe Trail travelers and early Grant County residents, historic maps, aerial photographs, interviews with long-time residents, early newspaper accounts, and an analysis of the geological and hydrological characteristics of the area. The National Park Service also examined archeological artifacts that were found in the vicinity of the spring site and illustrate the area's use as a camp site for Santa Fe Trail travelers.

Environmental Description

Walter Prescott Webb (1931) in his classic history of western settlement, *The Great Plains*, observed that practically every institution that was carried across the Great Plains "was either broken and remade or else greatly altered. The ways of travel, the weapons, the method of tilling the soil . . . and even the laws themselves were modified." It was the arid environment of the western plains that forced these changes. Westbound travelers following the Santa Fe Trail were physically and psychologically affected once they entered the High Plains. To many Santa Fe traders the treeless, flat, windswept plains of southwestern Kansas were more an obstacle to progress than any imagined or real Indian threat.

In 1848 a Santa Fe Trail traveler described the route between the Arkansas and Cimarron Rivers as "the most desolate part of the whole Santa Fe Road." Adolphus Wislizenus (1848) also observed, "The soil is generally dry and hard: the vegetation poor, scarcely anything grows there but short and parched buffalo grass and some cacti. Though the horizon is very distant, there is no shrub or tree to fix your eye upon . . . ." Today, although a few more cottonwood trees line the banks of the Cimarron River, the area surrounding the Lower Cimarron Spring still generally matches Wislizenus' description.

The Lower Cimarron Spring camp site is in an agricultural area approximately 12 miles south of the farming community of Ulysses, Kansas. Most of the land surrounding the spring site is used for cattle grazing; the land west of the site is under pump irrigation. Historically the Lower Cimarron Spring and its associated marsh were located adjacent to the Cimarron River, which formed a natural boundary for the camping area related to the spring. Today both the spring and marsh are dry, but the Cimarron River remains the predominant landscape feature (Figure 2).

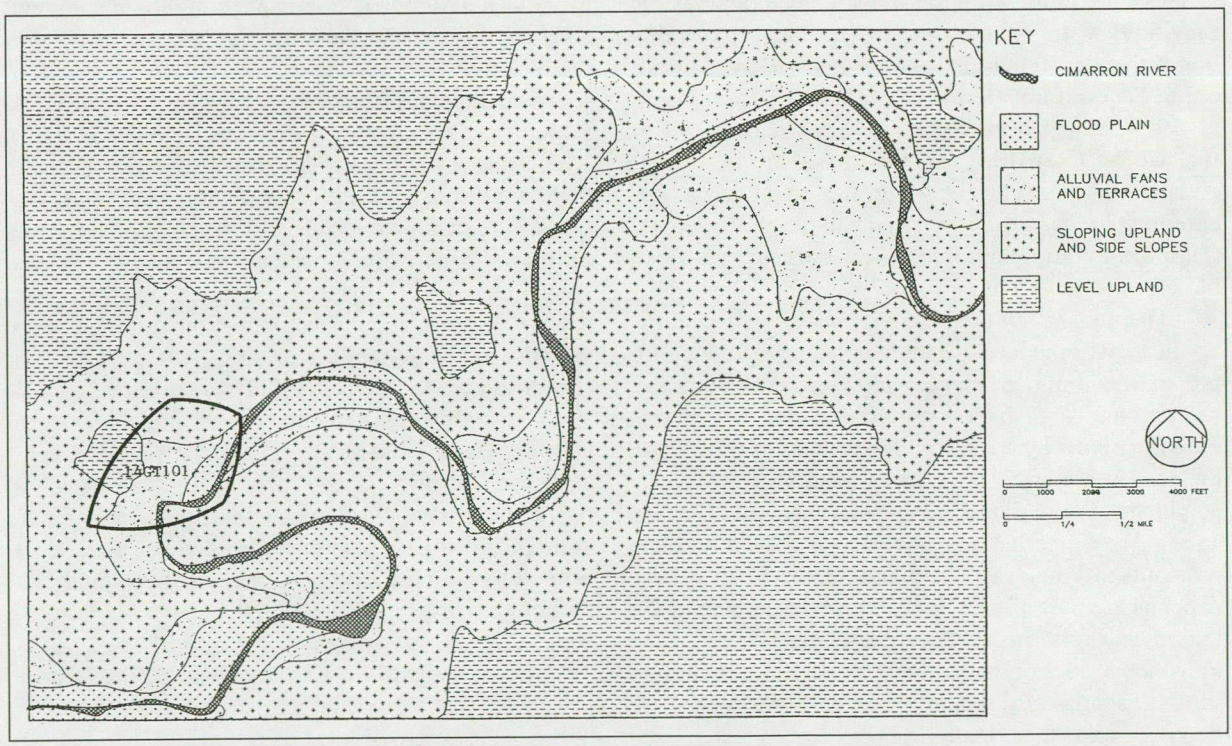


Figure 2. Soil pattern and topography in the vicinity of the Lower Cimarron Springs camp site (14GT101).

The Cimarron River originates in New Mexico near Raton. From the New Mexico tablelands the river flows east into Oklahoma, north into Colorado and Kansas, then back into Oklahoma, where it discharges into the Arkansas River and finally into the Mississippi River. In the vicinity of the Lower Cimarron Spring camp site, the Cimarron River is an intermittent stream, historically prone to flooding. In the neighborhood of the spring, the river valley has sloping walls, and the gently undulating river bed is nearly level. Elevation of the valley ranges from approximately 2,080 feet above mean sea level (amsl) along the river to 3,100 feet amsl on the uplands. Located within the rain-shadow of the Rocky Mountains, the climate is semi-arid. The region has little precipitation, abundant sunshine, moderate winds, and low humidity. The summers tend to be hot; the winters are cold. Both daily and annual temperatures exhibit wide variation.

The Lower Cimarron Spring camp site lies in the High Plains section of the Great Plains physiographic province in southwestern Kansas (Fenneman 1931; Hamilton et al. 1969:1). With the exception of the major drainages of the Arkansas and the Cimarron rivers, the region has poorly developed surface drainage. The uplands surrounding Lower Cimarron Spring camp site are fairly smooth, large expanses of land with broad gentle swales and shallow depressions. These depressions may hold water for days or weeks after heavy rains, which, under the right conditions, offered thirsty Santa Fe Trail travelers welcome relief (Hamilton et al. 1969:45; O'Brien 1984:21). The area lies within the Colby-Otero-Bayard soil association, which consists of "deep, gently sloping to sloping, calcareous, loamy soils on fans and in the uplands" (Hamilton et al. 1969:5-6). These soils are susceptible to water and wind erosion.

The geology of the area represents the evolutionary history of the Rocky Mountains. During the uplifting of the mountain system in the Tertiary period, large volumes of rock were eroded and transported onto the plains by the rivers. By the end of the period, the eroded materials covered an area from the Rocky Mountains to the Flint Hills in central Kansas (Wilson 1984:33). Western Kansas is part of the non-eroded remnants of this vast sand-and-gravel plain. These deposits are part of the Ogallala Formation, one of the major aquifers in the central Great Plains. Late Pleistocene loess mantles the upland regions. Eolian sand deposits also occur over earlier Pleistocene deposits and the Ogallala Formation in localized areas. In addition, erosional and depositional episodes in the Pleistocene created terraces along the major rivers, including the Cimarron River.

During the Nebraskan and Kansan glacial stages, terrace deposits were laid down along the Cimarron River. Erosion during the Late Pleistocene resulted in the exposure of sand and gravel sediments on these terraces. This activity formed flanking pediments along the Cimarron River valley. In areas where the river and its tributaries have cut through the unconsolidated sediments into the underlying rock formations, seeps and permanent springs occurred, such as Lower Cimarron Spring (Frye et al. 1959; Frye and Smith 1942:215-221; Hamilton et al. 1969:44).

Located within the rain-shadow of the Rocky Mountains, the climate is semi-arid (Brown 1969:47; Hamilton et al. 1969:44-45; Robb 1941:873-883; Trewartha and Horn 1980:360-364). The region has little precipitation, abundant sunshine, moderate winds, and low humidity. The summers tend to be hot; the winters are cold. Both daily and annual temperatures exhibit wide variation. The majority of the precipitation generally falls as rain between April and October. Average annual precipitation is 16.95 inches, with the months of May through August averaging more than 2 inches of rainfall per month. Thunderstorms during these four months produce much of the annual precipitation. Heavy downpours with hail and high winds occasionally occur, as do tornadoes. Extended periods of drought are common, with the longest and most damaging one occurring in the 1930s.

The Lower Cimarron Spring camp site also lies within the Kansan biotic province (Dice 1943:26-27), which consists of the short-grass region that covers the southern part of the Great Plains. Native vegetation in the spring area consists of blue grama, buffalo grass, perennial three-awn, broom snakeweed, sand paspalum, sand sagebrush, small soapweed, sand dropseed, western ragweed, side-oats grama, western wheatgrass, switchgrass, and little bluestem (Hamilton et al. 1969:27-28). The short grass association is highly resistant to drought and grazing. In addition these grasses, especially the grama grasses and the buffalo grass, produce nutritious and palatable forage for domestic livestock and native herbivores. Prickly pear cactus and yucca also occur, especially along the rougher valley margins. Although trees are rare, cottonwoods occur along the banks of the Cimarron River (O'Brien 1984:22).

Just as the landscape changed during the Historic period, so has the wildlife. Bison was the dominant herbivore prior to Euro-American settlement. Early explorers and travelers reported herds of 1,000,000 or

more animals. The pronghorn antelope and wapiti (elk) also inhabited the region in large numbers. Both white-tail and mule deer may still be found along the major streams. Carnivores included the plains grizzly bear and gray wolf. Small mammals included the coyote, black-footed ferret, swift fox, badger, prairie dog, white-tailed and black-tailed jackrabbits, western cottontail rabbit, skunks, raccoon, beaver, and numerous species of small rodents. Birds included several small ground-nesting species as well as the larger bald eagle, raven crow, several hawks and owls, sharp-tailed grouse, and prairie chicken. Migratory fowl included golden eagles, morning doves, ducks, and geese. The plains garter snake, the western rattlesnake, and the bullsnake, as well as several species of lizards and turtles, constituted the reptilian species common to the region. Numerous invertebrate species were also common (Brown 1984:62-63; O'Brien 1984:22; Shelford 1963:344-347; Walstrom 1969:30).

Santa Fe Trail, 1821-1880

The Santa Fe Trail, which extends between Franklin, Missouri, and Santa Fe, New Mexico, was one of the most important overland trails in the history of the United States and played a critical role in the nation's westward expansion. The trail linked various routes that first were followed by American Indians, then by Spanish, Mexican, and American frontiersmen. Between 1821 and 1848 the Santa Fe Trail served as an international trade route, transporting goods between Mexico and the United States. After the United States acquired Mexico's northern provinces in 1848, the Santa Fe Trail continued as a major commercial link between regions, fostering an exchange among Spanish, Indian, and American cultures.

Prior to the Mexican Revolution of 1821, Spain had forbidden foreign trade in Mexico's northern provinces. Although Santa Fe residents wanted the manufactured goods and textiles available in the United States and Americans had long desired the furs and silver available in Santa Fe, such commercial exchange was prohibited. Northern Mexico's authorized trade routes were to the south, along the road between Santa Fe and Chihuahua. Still, Santa Fe residents had become increasingly familiar with the numerous trails on the eastern slopes of the Rocky Mountains and the western Great Plains. Euro-American explorers, traders, and trappers traveled on portions of what became the Santa Fe Trail at least two centuries before the Mexican Revolution; native Indian peoples traveled these roads many centuries earlier. Indian trade fairs at Pecos and Taos among the Pueblo and Plains Indians also introduced northern Mexico's residents to native products, and the possibility of a broader range of trade goods (Billington 1974:388; Brandon 1990:2-17; National Park Service 1990:8).

Led by Augustin de Iturbide, the Mexican Revolution of 1821 gave Mexico its independence and eliminated Spain's earlier opposition to foreign trade in the northern provinces. Missouri trader William Becknell was the first American trader to benefit from Santa Fe's new-found independence. On November 13, 1821, a small trading expedition led by Becknell encountered Mexican troops near present-day Las Vegas, New Mexico, and learned of the Mexican Revolution. Three days later, Becknell's party arrived in Santa Fe. While earlier foreign traders who had ventured into Santa Fe were jailed and had their trade goods confiscated, Becknell found an eager and ready market. When Becknell returned to Missouri, he carried a message from New Mexico Governor Facundo Melgares that American traders now were welcome in Santa Fe. Although Becknell was the first American trader to enter an independent Santa Fe, others soon followed. On December 1, 1821 (only two weeks after Becknell's arrival), Thomas James brought a cargo of textiles into Santa Fe. Another trading expedition, led by Hugh Glenn and Jacob Fowler, arrived on December 29, 1821 (Moorhead 1954:13; Beachum 1982:21,29; Oliva 1967:7-8; Olsen and Myers 1992).

During the 1820s both Mexican and American officials actively promoted trade between their nations. In 1823 New Mexico Governor Bartolome Baca sent a delegation of merchants to Washington, D.C., to negotiate commercial trade agreements. In May 1824 America's first commercially organized trade caravan to Santa Fe departed from Franklin, Missouri. Led by Augustus Storrs, the caravan comprised 81 men, 156 horses and mules, 23 wagons, and 1 cannon. The Storrs expedition set the pattern for future caravans by electing officers and formally adopting a set of rules at the beginning of the journey, including regulations regarding "the conduct of the members towards each other, and their intercourse with the Indians" (Hulbert 1933:78-79). The Storrs caravan carried approximately $30,000 worth of goods to Santa Fe. On September 24, 1824, the caravan returned to Missouri with almost $190,000 in silver and furs (Billington 1974:390; Hulbert 1933:78; Oliva 1967:10).

The success of the Storrs expedition, the results of which were reported to a U.S. Senate committee,

only furthered American interest in trade with Santa Fe. On March 3, 1825, President James Monroe signed a bill that established a commission to negotiate treaties with Indians along the Santa Fe Trail. The bill also authorized a U.S. government-sponsored survey to mark the trail route. Commissioners Benjamin H. Reeves, George C. Sibley, and Thomas Mather headed the survey; Joseph C. Brown was appointed chief surveyor. Conducted between 1825 and 1827, the survey of the original Santa Fe Trail delineated what later became known as the Cimarron Route. From its eastern terminus in Missouri, the trail followed the Arkansas River across central Kansas, crossed the waterless plains of the *jornada* to the Cimarron River, and then coursed through what is now the Oklahoma Panhandle and entered New Mexico. The later Mountain Route (also known as the Bent's Fort Route and the Raton Route) followed the Arkansas River to Bent's Old Fort in Colorado before heading south over Raton Pass toward Santa Fe (Hulbert 1933:107; National Park Service 1990:14).

The Santa Fe Trail soon became a lucrative trade route, adding to a broader network of international trails and the wealth of both Mexico and the United States. Trade caravans along the Santa Fe Trail became an annual event. Around the first of May, Santa Fe-bound traders would gather in Missouri to make preparations for the journey, which included procuring wagons, buying food and supplies, and organizing into teams. The wagons began rolling toward Santa Fe in mid- to late May, as soon as the spring grass was high enough to support draft animals. According to Missouri trader Josiah Gregg whose 1834 caravan had 160 men, 80 wagons, and $150,000 worth of goods about half of the wagons were pulled by mules, the other half by oxen. Horses were used only during the earliest stages of the trail's commercial use when mules were not readily available. Depending on the route chosen, as well as weather and trail conditions, most Santa Fe-bound travelers reached their destination at the end of July or first part of August and returned to Missouri before the onset of winter. The major point of rendezvous for eastbound travelers was the area near La Junta (later Watrous), New Mexico (Moorhead 1954:23-25,213; National Park Service 1990:9).

By 1844 Gregg observed that the Pittsburg wagon, a variation of the Conestoga wagon that was usually pulled by eight mules or oxen, was the most-used vehicle on the Santa Fe Trail (Moorhead 1954:24n). The lucrative Santa Fe Trail trade soon induced wagon makers to build even bigger wagons specifically for Santa Fe Trail use, often pulled by 10 or 12 draft animals. In 1861 Santa Fe Trail freighter D. M. Draper (1861:2) noted:

> Our wagons were the huge, old-fashioned kind, nicknamed "Santa Fe Schooners." Of miscellaneous freight they held about 6,000 pounds, a fair load for those days. I am about five feet six high, and when standing on the wagon tongue could just reach the top of the front endgate. The wagon covers were made of heavy twilled cotton and doubled.

America's major trade good to Mexico was cloth, much of it imported from England and Europe. Cotton cloth was the most popular, followed by silks and linens. Mexican residents also were eager for dry-goods items, such as hardware, cutlery, jewelry, and notions. The major items returned to the United States through trade were gold and silver Mexican dollars, silver bullion, and gold dust, as well as mules and donkeys, furs, buffalo rugs, wool, and Mexican blankets (Oliva 1967:19).

In 1846, when America entered into war with Mexico, the Santa Fe Trail also became a major route for soldiers and government supply trains. In that year alone, an estimated $1,000,000-worth of merchandise and army supplies went over the trail. During the war Brig. Gen. Stephen W. Kearny followed what later became known as the Mountain Route of the Santa Fe Trail as he led the Army of the West from Fort Leavenworth, Kansas, to Las Vegas, New Mexico. The Mormon Battalion and other elements of the army followed the original (Cimarron) route. At the conclusion of the war, New Mexico belonged to the United States and Santa Fe trade was no longer foreign commerce. Although the days of the "old" Santa Fe Trail were over, the trade route continued to thrive.

The volume of traffic on the Santa Fe Trail rose considerably after the war. The California Gold Rush of 1849, as well as the Colorado Gold Rush a decade later, increased the use and importance of the route. In 1850 mail and stage service began over the trail. Although emigrants traveled the Santa Fe Trail into America's new Southwest, the trail remained primarily a commercial trade route. The U.S. Army, which was responsible for protecting the region, established several military posts along the trail, including Fort Mann (1847), Fort Atkinson (1850), Fort Union (1851), Fort Larned (1859), and Fort Lyon (1860). During the U.S. Civil War, additional posts were established at strategic points (Oliva 1967:22; National Park Service 1990:10; Taylor 1971:1).

During the Civil War years the Mountain Route gained in popularity as Union authorities in New

Mexico feared that Confederate soldiers from Texas might cut the supply and communication lines along the trail's Cimarron Route. Although that threat never materialized, some traders also avoided the Cimarron Route because of escalating confrontations with American Indians. In 1861 the commanding officer at Fort Larned directed all wagon trains to use the Mountain Route. In 1866 one traveler noted that "the usual Route is by the Raton Pass and the Arkansas River" (National Park Service 1963:63-I; Meline 1867:261).

Eventually it was the railroad that ended the use of both the Mountain and Cimarron Routes of the Santa Fe Trail. In 1863 the Union Pacific Eastern Division, which later became the Kansas Pacific Railroad, began laying tracks westward from Kansas City. As the railroad moved westward, so did the eastern terminus of the Santa Fe Trail. Beginning in 1868 at Topeka, the Atchison, Topeka & Santa Fe Railroad reached Dodge City in 1872. One year later, the Atchison, Topeka & Santa Fe arrived in Granada, Colorado, and the Santa Fe Trail's Cimarron Route was virtually abandoned. On February 9, 1880, the first train steamed into Lamy, New Mexico, and reached Santa Fe on February 16, bringing an end to nearly 60 years of overland traffic on the Santa Fe Trail (Oliva 1967:23; Rittenhouse 1971:27).

The Cimarron Route of the Santa Fe Trail

For westbound travelers the Santa Fe Trail originated at various locations in Missouri. During the earliest years of trail trade, the caravans usually departed from Arrow Rock or Old Franklin, Missouri. Fort Osage, where the 1825 government survey began, also served as a point of debarkation, as did Blue Mills. By the late 1820s the primary point of departure had moved westward to the town of Independence, Missouri. Westport, located within present-day Kansas City, and Fort Leavenworth, Kansas, also served as points of origins (National Park Service 1990:14; Oliva 1967:13-14).

Santa Fe-bound wagoneers made the first part of the journey independently, as they followed the well-marked trail west of Independence. At Council Grove, about 150 miles west of Independence, the traders made final equipment adjustments and structured themselves into caravans. It was also at this point that the travelers elected one of their group, usually the most experienced trader, as the head of the caravan, and the wagons divided into groups. A lieutenant, also an experienced trader, headed each group (Billington 1974:390).

Near Great Bend, Kansas, which was approximately 270 miles west of Independence, the caravans reached the Arkansas River. Near present-day Larned the Santa Fe Trail temporarily split into two branches. Caravans could choose either the more northern "Dry Route," which was shorter and faster, or the southern "Wet Route," which had available water. A short distance east of Dodge City, these two routes converged. It was at this point that the Santa Fe trade caravans could choose to make the first of the three major crossings of the Arkansas River that led to the Cimarron River. Prior to the Mexican War the Arkansas River in this area also marked the boundary between American and foreign soil. It should be noted that the travelers followed different Santa Fe Trail routes, depending on the season and whether the year had been wet or dry. These variations resulted in routes that could be several yards or several miles apart. Well-traveled routes also often became "braided" because of mud holes, excessive rutting, insufficient forage for draft animals, or difficult stream crossings. In addition, more adventurous travelers tried alternative routes to either find water, avoid encounters with Indians, or shorten travel time (National Park Service 1990:14).

The Lower Arkansas Crossing, also known as the Mulberry Creek Crossing, began at that point where Mulberry Creek enters the Arkansas River. The Middle Arkansas Crossing, also known as the Cimarron Crossing, was located approximately 40 miles upriver (west) from the Lower Arkansas Crossing, near the present town of Cimarron, Kansas. The Upper Arkansas Crossing, located at Chouteau's Island on the Arkansas River near the present town of Lakin, Kansas, was the most direct southern route and was the one taken by the 1825 government survey. According to Santa Fe Trail historian Hobart E. Stocking (1971:160), the trip from Chouteau's Island to Lower Cimarron Spring was approximately 25 hours by ox-cart. Of these three crossings the Middle Arkansas (Cimarron) Crossing was the most popular (Oliva 1967:17). All of the crossings led to Lower Cimarron Spring (Figure 3).

For travelers who used the Cimarron Route, which was the primary route during most of the commercial years of the trail, it was approximately 753 miles from Independence to Santa Fe. The Mountain Route, which followed the northern bank of the Arkansas River into Colorado before heading south over Raton Pass to Santa Fe, measured 797 miles. With Santa Fe Trail caravans averaging 10 to 15 miles a day, the Cimarron Route could eliminate at least 3 days of travel time. In addition, the Cimarron

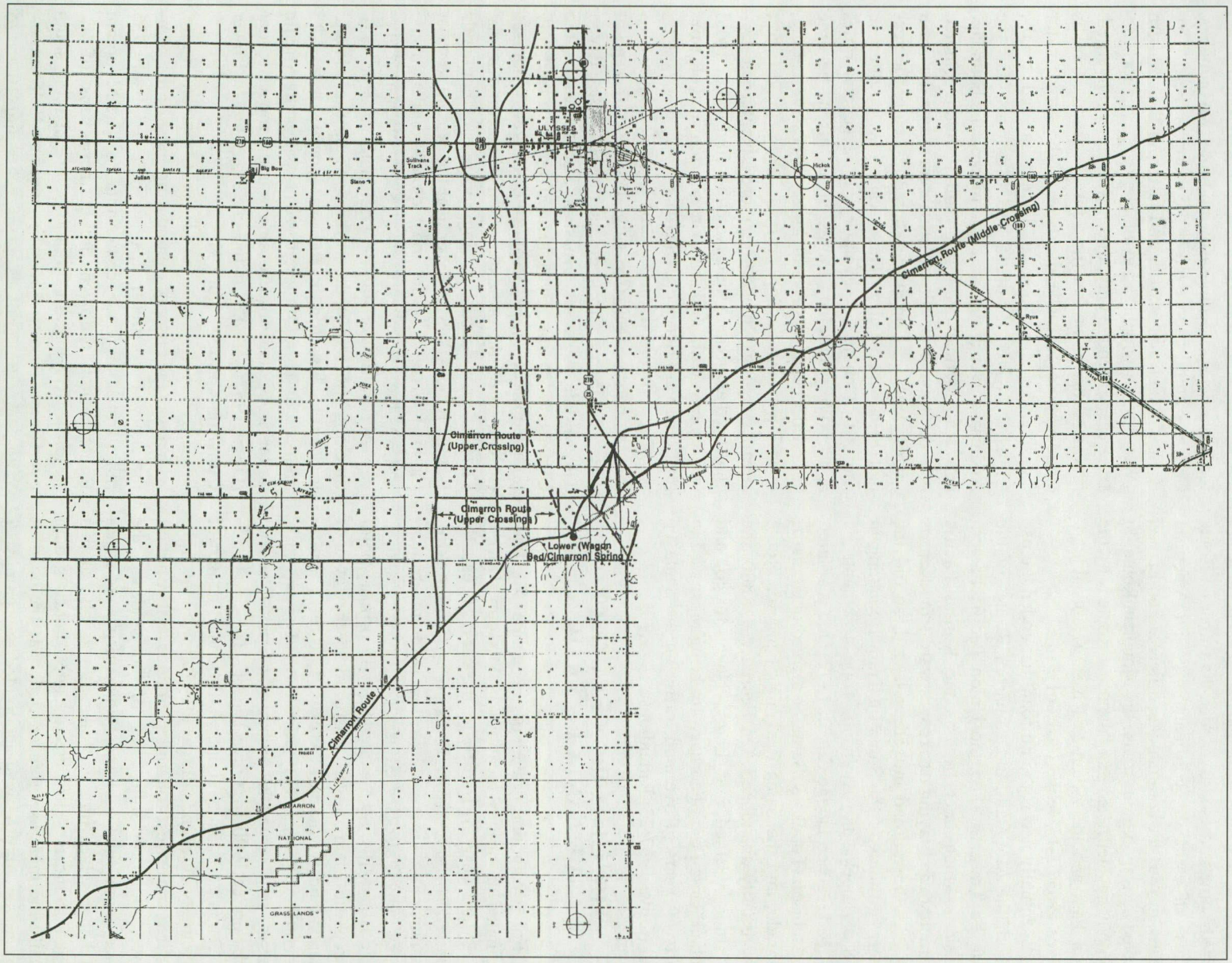


Figure 3. Santa Fe Trail in the vicinity of the Lower Cimarron Springs site (adapted from National Park Service 1990:Maps 53, 56, and 57).

Route also avoided the difficult trek over Raton Pass, which required additional travel time (Rittenhouse 1971:15; National Park Service 1990:14).

Although the Cimarron Route was at least 40 miles shorter than the Mountain Route, it was considered to be a more dangerous journey as it necessitated crossing the *jornada*, the desert land between the Arkansas and Cimarron rivers. According to Stocking (1971:149, 160), *jornada* is idiomatic for a "journey" that it is hoped will be completed in one day. On the *jornada* water was scarce, and travelers often reported seeing mirages of water pools during the scorching heat of the day. Despite the daytime heat, night temperatures dropped drastically, and firewood was almost as hard to find as water. One traveler recalled, "Tons of iron strewed the road, remnants of scenes when for temporary relief freezing men burned the woodwork of their wagons" (Brake 1896:130).

Trade caravans also were wary of encountering the many American Indians who traveled the Santa Fe Trail's Cimarron Route. Native Americans hunted buffalo in the area and congregated along the trail in anticipation of receiving annuities and trading with the caravans. However, as increasing numbers of trade wagons began to disrupt tribal life and encroach on traditional lands, the trail became the site of several conflicts between traders and Indians. Despite their apprehensions, caravan travelers also frequently relied upon the Indians to guide them through the region, particularly in the early years of the trail. In 1831, when Josiah Gregg's caravan got lost on the "inhospitable desert" of the *jornada*, the group encountered Indians who led them to Lower Cimarron Spring (Moorhead 1954:55-57).

Before leaving the Arkansas River to cross the *jornada*, travelers often spent a day or so of rest on the Arkansas River, where they filled water barrels and prepared for the journey. Lower Cimarron Spring was approximately 58 miles southwest of the Middle Crossing, and travelers tried to cross this stretch of trail as quickly as possible. Santa Fe- bound travelers often began their *jornada* crossing in the afternoon and traveled through the night, stopping for only a few hours rest. With perseverance and luck, they reached Lower Cimarron Spring the next day. Aerial photographs, taken by the U.S. Department of Agriculture, of the Lower Cimarron Spring vicinity show numerous trail ruts leading to the spring site, underscoring its importance as a destination stopping point for Santa Fe Trail travelers (Moorhead 1954:55-57; Stocking 1971:160).

Many travelers had difficulty finding the trail to Lower Cimarron Spring. In Gregg's classic 1844 account of the Santa Fe Trail trade, *Commerce of the Prairies*, the trader observed that the arid plains between the Arkansas and Cimarron rivers were furrowed with buffalo paths, which made the route "exceedingly perplexing to the bewildered prairie traveler." The buffalo paths, wrote Gregg, "have all the appearance of immense highways, over which entire armies would seem to have frequently passed. They generally lead from one watering place to another; but as these reservoirs very often turn out to be dry, the thirsty traveller who follows them in search of water, is liable to constant disappointment" (Moorhead 1954:64-65).

On his first journey to Santa Fe, Becknell followed the Arkansas River into what is now Colorado before heading south into New Mexico. In 1822 on his second trip to Santa Fe, Becknell crossed the *jornada* between the Arkansas and Cimarron rivers. Becknell's expedition consisted of 21 men and 3 wagons, which reportedly marked the first use of wagons for commercial trade on the trail (Beachum 1982:34). Becknell did not detail his crossing of the Cimarron desert in his journal of the expedition, but Gregg described the hardships that reportedly were endured by the Becknell party. Santa Fe Trail scholars have since questioned Gregg's accuracy in attributing the following tale to the Becknell party. However, even if fictionalized, this often-told tale only increased traders' trepidations about crossing the *jornada*.

> . . . the [Becknell] party embarked upon the arid plains which extended far and wide before them to the Cimarron River. The adventurous band pursued their forward course without being able to procure any water, except from the scanty supply they carried in their canteens. As this source of relief was completely exhausted after two days march, the sufferings of both men and beasts had driven them almost to distraction. The forlorn band were at last reduced to the cruel necessity of killing their dogs, and cutting off the ears of their mules, in the vain hope of assuaging their burning thirst with the hot blood. This only served to irritate the parched palates, and madden the senses of the sufferers (Moorhead 1954:14).

Finally, according to Gregg (Moorhead 1954:15), "just as the last rays of hope were receding from their vision," the traders came upon a buffalo "fresh from the river's side, and with a stomach distended with water . . . . The hapless intruder was immediately dispatched, and an invigorating draught procured from its stomach" (Moorhead 1954:15).

After this "refreshment," the Becknell party was able to reach Taos and, eventually, Santa Fe.

Two years later in 1824, Augustus Storrs also chose to cross the *jornada*. M. M. Marmaduke, a member of that expedition who later became governor of Missouri, described the suffering endured by the traders and their animals on the Cimarron Route. "I have never in my life experienced a time when such general alarm and consternation pervaded every person on account of the want of water," Marmaduke wrote in his trip diary (Hulbert 1933:73). Marmaduke's diary held another vital piece of information about the Cimarron Route. The Cimarron River was usually dry, noted Marmaduke, and the water it occasionally did hold was "remarkably bad." But Marmaduke, like future travelers on the trail, quickly discovered that good water could be found by digging holes into the river bed (Hulbert 1933:73).

Gregg, who made four trips between Santa Fe and Missouri, also noted the characteristics of the Santa Fe Trail's many "dry streams" that, like the Cimarron River, had "remarkably shallow channels, which, during droughts, sometimes go dry in their transit through the sandy plains." In these rivers, noted Gregg, "travelers procure water by excavating basins in the channel, a few feet deep, into which the water is filtrated from the saturated sand" (Moorhead 1954:358,359n). As a result, Santa Fe Trail travelers who did not find Lower Cimarron Spring could still obtain water by digging in the Cimarron River channel, which may account for the many conflicting early descriptions of the spring site.

Early Descriptions of the Lower Cimarron Springs

Journals and diaries of travel on the Santa Fe Trail offer various and often contradictory descriptions of the Lower Cimarron Spring. James A. Little (1904:41), who traveled the Cimarron Route in 1854, remembered, "The first [good] water that we reached was the Cimirone [sic] Spring on a stream by that name . . . . We were almost perishing for water. With our tin cups in hands we surrounded the springs where the cold, sparkling water was gushing from under the bank." Julius Froebel (1859:280) in his 1852 crossing also found the spring on the bank of the river and noted that the spring water was sweet, while the river water was stagnant and brackish. By contrast other travelers, such as John McCoy, who traveled the route in 1848, recalled, "Approaching the Lower Cimarron Spring we hoped to obtain an abundant supply [of water], but it was only by digging in the bed of the stream water enough for drinking, much less in sufficient quantities for the stock was to be had" (McCoy 1924:22-23).

It is likely that travelers, such as McCoy, thought they had reached the Lower Cimarron Spring, when they had only encountered the Cimarron River. As noted above, travelers could always obtain water in the often-dry Cimarron River bed by digging down a few feet. Yearly variations in weather and rainfall also would have changed the characteristics of the spring and the river. In addition, the fact that ground water probably surfaced in more than one location over the years — which is supported by a hydrological study of the area, as well as by the accounts of long-time local residents — also may account for the variety of descriptions regarding the Lower Cimarron Spring.

The records of the U.S. government-sponsored survey of the Santa Fe Trail offer some of the earliest descriptions of the Lower Cimarron Spring. The spring was described in survey commissioner George Sibley's journal of the expedition, as well as in the "Field Notes of Joseph C. Brown, United States Surveying Expedition, 1825-1827." Sibley's journal reports that the survey party began its expedition across the Cimarron desert at 8:35 a.m., September 27, 1825. The survey party crossed the Arkansas River at the Upper Crossing at Chouteau's Island and headed almost directly south toward the Cimarron River. While other travelers were humbled by the *jornada* crossing, Sibley seemed unfazed. "So much for this Bugbear," he commented in his journal (Gregg 1952:87-88).

On the evening of September 28, the expedition reached the "famous Semerone [Cimarron] Spring," which Sibley noted had a north latitude of 37° 24' 00", which was "well ascertained by observations of the [constellation] Aquilae." At noon the next day, surveyor Joseph Brown confirmed the accuracy of that latitude (Gregg 1952:88). Although Brown's survey notes do not include the longitude at the Lower Cimarron Spring site, his maps of the Santa Fe Trail show it as being immediately west of the 101° west longitude mark (Baughman 1961:30; *Kansas City Star*, 4 August 1925). In addition, Brown's maps show the Lower Cimarron Spring as being almost directly south of Chouteau's Island on the Arkansas River (Wood 1983:Sheets 8 and 9). Gregg's 1844 map of the Santa Fe Trail also shows the Lower Cimarron Spring site as being at approximately the same latitude and longitude as given by the Sibley-Brown party. In his journal Sibley also noted that the Lower Cimarron Spring

> issues from a Hollow near the So[uth] E[ast] Extremity of the large Valley that it waters.

> The Valley is in area probably 300 acres, & is for the most part well set with good grass . . . . The Springs, as I saw it, appeared small, probably because an immense herd of Buffalo had just been treading about it. It no doubt afford an abundant supply of Water when properly opened, as it always is when the Indians camp near it. Its water is cool, sweet and good (Gregg 1952:88-89).

Brown's field notes of the journey also describe the spring site. Brown recorded that 480 miles from Fort Osage the expedition reached "Lower Semaron [sic] Spring," which he described as being at "the west edge of marsh green with bulrushes. The marsh is north of the creek and near it. The spring is constant, but the creek is sometimes dry . . ." (Hulbert 1933:122). Brown's description of the spring site as a marshy area coincides with other descriptions of the site. A member of the Doniphan Expedition of 1846 described the spring as an "oasis in the desert," with rushes growing on the banks. James C. Hall, who took the Cimarron Route in 1863, described the Lower Cimarron Spring as a "wide marshy plat" (Hall 1911; Wislizenus 1848:49-55).

The Doniphan Expedition encountered a large group of Cheyenne camped near the Lower Cimarron Spring, reflecting the historic use and importance of the spring site for American Indians. As trail traffic increased, the relationship between the Indians and the caravan travelers deteriorated, and the Lower Cimarron Spring became the site of several violent encounters. By 1863 hostilities had escalated to the point that Brigadier General James H. Carleton, Commander of the Department of New Mexico, recommended placing a cavalry regiment at a number of strategic points along the Santa Fe Trail, including the Lower Cimarron Spring. The following year was the most violent in the trail's history. On August 13, 1864, Comanche Indians killed five traders near the Lower Cimarron Spring and stampeded the caravan's cattle. Six days later, another battle near the spring left ten men dead. In 1865 the federal government took several measures to ensure safer travel for trade caravans, including a new system of military escorts for caravans, the establishment of additional military posts, and renewed efforts to negotiate a peace settlement with the Indians (Oliva 1967:146,154-155,160-161).

Homesteading and Agricultural Settlement in Grant County

Agricultural settlement of Grant County began in the late 1870s. In 1879 Richard H. Joyce filed the county's first homestead claim (14GT104), and his land included the Lower Cimarron Spring site. By this time the spring site was popularly known as Wagon Bed Springs, as a result of a wagon bed having been placed in the spring. Early journal accounts by Cimarron Route travelers make no mention of the wagon bed, and the stories regarding the placement of the wagon bed are largely anecdotal. Local resident E. F. Towler, who lived in the vicinity of the spring (14GT105), reportedly said that he was told by William Boyd of Missouri that an 1849 caravan placed a bottomless wagon bed into the spring as a casing to collect water. Another popular story is that an 1871 cattle drive placed an abandoned government wagon in the spring to serve as a water collector (*Ulysses News* 1992:16).

J. W. Dappert, who served as Grant County surveyor, gave the earliest recorded account of finding a wagon bed in the spring. In a 1944 letter to the *Ulysses News*, Dappert recounted how he and Azel Cook, another local resident, "dug out the old Wagon Box in Wagon Bed Spring in January 1886" so that they could water their livestock. Dappert, who homesteaded in the area and was living approximately 2,400 feet northwest of the spring, recalled "that one or two of the [wagon bed] boards were of a yellowish-red color and I thought POPLAR [sic] wood and still had strips of flat iron 'Straps' nailed upon top edge of plank" (Dappert 1944).

In November and December of 1887, Dappert and Joyce built an icehouse on the north bank of the Cimarron River near the site of the Lower Cimarron Spring. (The remains of this icehouse were identified during these investigations.) According to Dappert's diary, the icehouse was located

> on the north bank of the Cimarron river, just alongside a deep hole in the river below [presumably downstream from] Wagon Bed Springs . . . . We made the ice house of sod two feet thick, made a door at the north end, placed sills on top of the walls, and a frame and plank roof, covered with tar paper, cut a ton of slough grass for use instead of sawdust to place under and around the ice to keep out the heat and thus preserve the ice (Wilson and Sears 1950:242).

The following January, when the ice in the Cimarron River froze to a thickness of 8 to 10 inches thick, Dappert and Joyce began putting up the ice. As Dappert described it,

> I cut the ice into blocks about 18 inches square and Mr. Joyce used a rope with a noose to lasso the chunks out of the water

and skidded them up to the ice house door . . . The dimensions inside being 16 by 18 by 6 feet, which as I figured it would contain 48 tons of ice . . . (Wilson and Sears 1950:242).

Another source of information on the characteristics and location of the Lower Cimarron Spring at least how it appeared in the early twentieth century was provided by local resident, Lucille Towler Lewis, who was born in Ulysses in 1901. In 1902 her family moved to a ranch (14GT105) located north of the Cimarron River in the vicinity of the Lower Cimarron Spring. Mrs. Lewis lived at the site until 1941, at which time the ranch was destroyed by a flood.

Mrs. Lewis recalled that the Lower Cimarron Spring was located north of the Cimarron River near the northwest corner of the bend in the river. Similar to the accounts of several Santa Fe Trail travelers, Mrs. Lewis noted that the spring site was a large marshy area, approximately 40 feet across, filled with cat tails and rushes. The presence of such a large marsh indicates a long-term, reliable source of water rather than an intermittent discharge of ground water. Mrs. Lewis also recalled that the spring water ran through the winter, providing a continuing source of ice. Because of changes to the river channel, that site is today located in the river bed (Lucille Towler Lewis, personal communications 1993; *Ulysses News* 1941).

Historical Designation of the Lower Cimarron Spring

In 1907 E. F. Towler (Lucille Towler Lewis' father) petitioned the Daughters of the American Revolution (DAR) to place a Santa Fe Trail marker at the Lower Cimarron Spring (Figure 4). The DAR, in conjunction with the Kansas State Historical Society, agreed to the request, and Towler's correspondence indicates that the marker was located in "about the center of the section in the NW corner of the quarter," noting that the stone "is also about 50 yards of the wagonbed." At Towler's recommendation the stone was engraved with the words "Wagonbed Springs." The granite marker was placed by Towler and his brother-in-law, Richard Joyce (Ed Lewis, personal communications 1993; Towler 1907a,1907b,1907c). Although the marker is engraved with the year 1906, Towler's correspondence with the DAR and the State of Kansas indicates that it was placed at the site in 1907. Lucille Towler Lewis stated that the spring was almost directly south and slightly east of the marker. According to Mrs. Lewis, it would have been impossible to have placed the marker much closer to the spring without getting into the swampy marsh land (Lucille Towler Lewis, personal communications 1993).

In 1914 the first of a series of devastating floods struck the area and dramatically altered the spring site. Dappert, who returned to the area in 1916 after an absence of several years, was shocked by the way in which the 1914 flood had changed the Cimarron River. He (Dappert 1944) wrote,

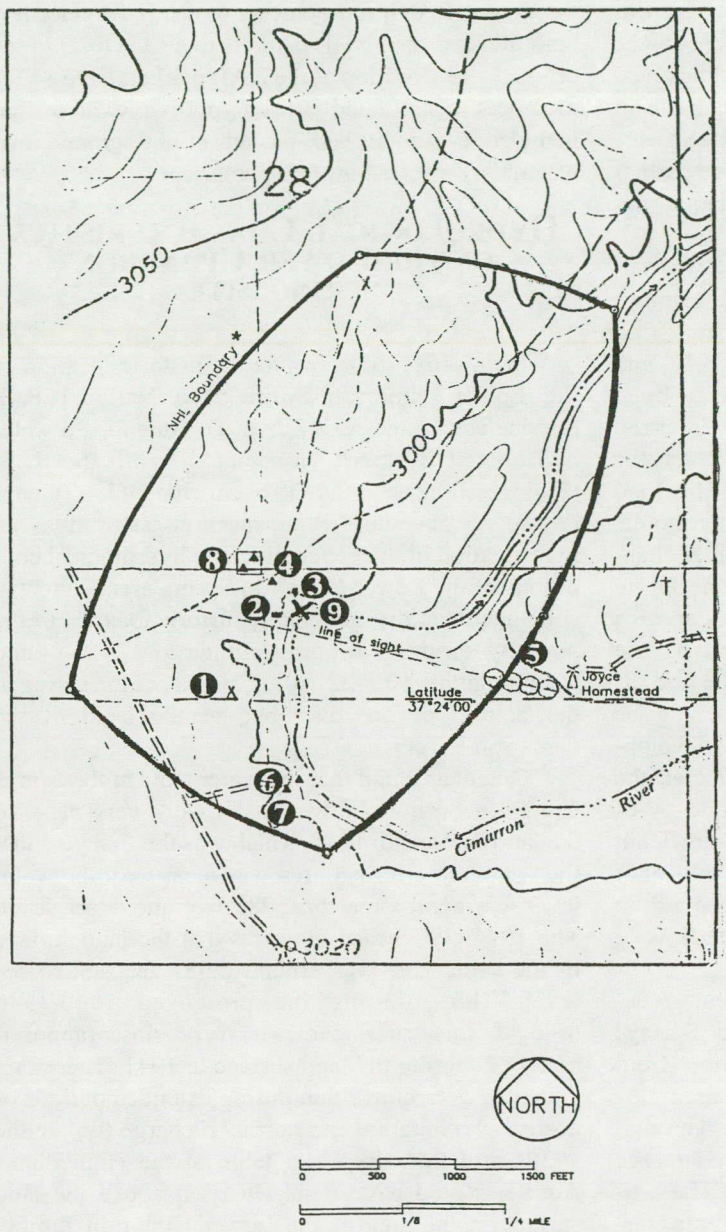
> . . . right at Wagon Bed Springs, the river had receded some hundreds of feet farther to east, thus shortening the quite abrupt bend . . . much of the area formerly growing "Cattails (Flags) was now covered with sand; but the most noted change was that of the width and size of the bed of the Cimarron River from a brook which I could easily jump across to a Sandy River 400 to 600 Feet from bank to bank.

Dappert later drew a map of the site, showing how the river channel had changed, which included the location of the Lower Cimarron Spring as he had found it in 1886. The 1914 flood effectively destroyed the spring site and its associated marsh, although spring water continued to surface in the general area (Dappert 1944).

In 1937 the local 4-H club, in cooperation with the Joyce family, moved the DAR marker to a site approximately 1,200 feet to the south. According to Harry Joyce, the present owner of the property and the grandson of homesteader Richard Joyce, the marker was moved because the 1907 marker location had eroded away. The new marker site was also closer to a road (no longer extant) and was more accessible for visitation. The new location, which was located in a shaded bend of the river, also offered better picnic facilities. The 4-H club built a brick cistern at the new location; the cistern filled with water and served as a representation of the Lower Cimarron Spring (Harry Joyce, personal communications 1993).

Harry Joyce, who was interviewed by the National Park Service in 1993, refuted a popular misperception that the historical marker was moved because the Joyce family believed the more southern (1937) marker site was the spring's historic location. Joyce, who was born in 1918, confirmed that the 1907 marker site was historically correct. Joyce also stated that the historic spring site generally lined up with a row of trees located on the Joyce property. The row of trees, which still stands, lines up with the 1907 DAR-designated site.

Although the DAR marker was moved for practical reasons to avoid erosion and provide better picnic facilities the 1937 marker site was eventually accepted



❶ **1825: SIBLEY-BROWN SURVEY OF LOWER CIMARRON SPRING.** On September 25, the government-sponsored surveyors of the Santa Fe Trail note that the spring is at north latitude 37°24'00".

❷ **1886: DAPPERT FINDS WAGON BED.** Dappert, a homesteader in Grant County, finds an old wagon bed at the spring site.

❸ **1887: JOYCE-DAPPERT ICE HOUSE.** Dappert and Richard H. Joyce build an ice house near the spring. In 1993, the National Park Service locates the archeological remains of the ice house.

❹ **1907: DAUGHTERS OF THE AMERICAN REVOLUTION (DAR) PLACE HISTORICAL MARKER AT SITE.**

❺ **HEDGE ROW OF TREES:** According to Harry Joyce, grandson of homesteader Richard H. Joyce, the spring lined up with row of trees on the Joyce homestead.

❻ **1937: 4-H CLUB MOVES HISTORICAL MARKER.** Since the marker site has eroded, the 4-H Club moves the marker to a new location approximately 1,200 feet to the south.

❼ **1962: NATIONAL PARK SERVICE PLACES A NATIONAL HISTORIC LANDMARK PLAQUE AT WAGON BED SPRINGS.**

❽ **1989: LOCAL CHAPTER OF THE SANTA FE TRAIL ASSOCIATION RELOCATES MARKERS TO A NEW DISPLAY AREA.**

❾ **1993: NPS INVESTIGATES LOWER CIMARRON SPRING SITE.** Archeologists find the remains of the Joyce-Dappert ice house, which was north of the spring. Hydrological investigations also determine the likely location of the now-dry spring is North Latitude 37° 24' 07" and West Longitude 101° 22' 10" – shown on the map as "X."

Figure 4. Chronology of events associated with the location of the Lower Cimarron Spring and various markers.

as the "historic" location of the Lower Cimarron Spring. In 1960 the Secretary of the Interior designated Wagon Bed Springs as a National Historical Landmark (NHL). During this time the National Park Service was completing the Santa Fe Trail component of the National Survey of Historic Sites and Buildings, and Wagon Bed Springs was identified as a trail site of exceptional significance (National Park Service 1963:23-II). In 1962 the National Park Service participated in a ceremony at which the NHL plaque was placed at the 1937 marker site.

In addition to the devastating flood of 1914, natural and man-made events caused further erosion to the site of the Lower Cimarron Spring. The spring site also was impacted by floods in 1941, 1942, and 1951. For the Towler-Lewis family, who lived approximately a half mile east of the Lower Cimarron Spring on the north bank of the Cimarron River, the 1941 flood was more devastating than the 1914 flood and caused them to permanently abandon their home. As a result of the flooding, the Cimarron River channel in the vicinity of the Lower Cimarron Spring shifted back and forth (east and west) over an area nearly half a mile wide, which is evident by the numerous rows of fallen trees in the channel bed, as well as by the several lines of sand bars marking the edges of the previous channels. Agricultural development and well drilling in the area also affected the water table, diminishing the flow and frequency of upwelling ground water. The most significant development occurred in the 1960s with the advent of deep-well irrigation in the area, which caused a drop in the water table and brought an end to the flow of spring water.

In the 1980s Edward Dowell, an amateur archeologist and member of the Wagon Bed Springs Chapter of the Santa Fe Trail Association from Ulysses, Kansas, began investigating the area surrounding the Lower Cimarron Spring site. Through the use of a metal detector, Dowell uncovered a large amount of Santa Fe Trail-related artifacts. The artifacts were concentrated generally in the area surrounding the historic location of the Lower Cimarron Spring, as marked by the 1907 DAR marker. The area investigated by Dowell also included several remnants of Santa Fe Trail ruts. By contrast, no ruts have been located near the 1937 marker, nor have any trail-related artifacts been found in that area.

Partly as a result of Dowell's investigations, and also based on historical accounts of the Lower Cimarron Spring, the Wagon Bed Springs Chapter of the Santa Fe Trail Association (SFTA) challenged the NPS-designated site. By this time the historic location of the spring had become a controversial issue as local residents, historians, and SFTA members debated where the historical markers should be located. In 1989 the Wagon Bed Springs chapter of the SFTA relocated both the DAR and NHL markers to a site closer to the original 1907 location of the DAR marker. Here SFTA members constructed an interpretive exhibit that included a wagon bed placed in the ground and watered by a solar-powered pump.

Hydrological Characteristics of the Lower Cimarron Spring Site

In an effort to determine the historic location of the Lower Cimarron Spring, the National Park Service contracted with Edwin D. Gutentag, a water hydrologist formerly associated with the U.S. Geological Survey (USGS). Gutentag (1993) conducted an on- site field inspection, as well as an investigation of the geographic and hydrological conditions of the Lower Cimarron Spring area. Gutentag concluded that the most likely historic location of the now-dry spring is at north latitude 37° 24' 07" and west longitude 101° 22' 10". This places the spring in the bottom of the river bed at the bend of the Cimarron River.

Gutentag found that the water table at the Lower Cimarron Spring site was historically very close to the land surface. In 1941, which was the first year that the water table in that area was measured, the water level was approximately 2,985 feet above sea level. The 1974 USGS map indicates that the land surface in the same area was around 2,987 feet above sea level. Thus, despite the prolonged 1930-1940 drought, the water level was very close (approximately 2 feet) to the land surface in 1941. Therefore, Gutentag determined that during extended periods of normal precipitation and normal recharge (unlike the 1930s drought), the water table of the High Plains Aquifer would have regularly risen above the land surface in the area of the Lower Cimarron Spring. (By 1975 the water level in the vicinity of the Lower Cimarron Spring was approximately 30 feet below the land surface, a consequence of deep-well pump irrigation in the area.)

Gutentag concluded that the Lower Cimarron Spring was historically located in the old sand-and-gravel stream channel of the Cimarron River. In a probable sequence of events, a flood along the Cimarron River when the channel was narrow produced a deep scoured cut that was below the water table. As a result, ground water was able to fill this

site. Gutentag also noted that springs that develop in sand and gravel can be considered artesian springs, and most springs of this nature are associated with quicksand. (The springs at the Highway 23 bridge over the Cimarron River south of Meade, Kansas, have artesian boils and quicksand.) As in the case of what eventually became known as "Wagon Bed Springs," an effective way to stabilize a low spot with upwelling ground water is to install a water collection device, such as a wagon bed. A wagon bed would maintain the spring, and prevent it from being trampled by animals or affected much by quicksand.

Gutentag also observed that during different seasons and years the upwelling ground water could have surfaced in more than one place along the Cimarron River, which could account for some of the varying descriptions of the spring. In hydrological terms the area is considered to be a "diffuse ground water discharge area" that includes other springs and a marshy area with the Lower Cimarron Spring as the main water source. As noted above, the historic marsh and shallow pools associated with the Lower Cimarron Spring would have resulted from a steady ground water discharge (Gutentag 1993,1994).

Historical and archeological evidence also supports Gutentag's conclusion that the Lower Cimarron Spring was located in the vicinity of the river bend. The accounts given by long-time residents Harry Joyce, Lucille Towler Lewis, E. F. Towler, and J. W. Dappert indicate that this was the historic location of the spring. This site also agrees generally with information found in historic journals, survey notes, and maps, particularly the 1825 Sibley-Brown survey. In 1993 the National Park Service archeologists located the archeological remains of the Joyce-Dappert icehouse, which also provided strong evidence regarding the historic location of the Lower Cimarron Spring. The icehouse remains (which match the dimensions given by Dappert in his diary) are located at north latitude 37° 24' 08" and west longitude 101° 22' 11" a site that agrees with Dappert's description that the icehouse was located just below (downstream) from the Lower Cimarron Spring.

Previous Archeological Investigations

The first systematic archeological investigations of the Lower Cimarron Spring camp site (14GT101) area did not occur until the late 1980s. Although collections of artifacts were made by amateurs prior to the late 1980s, no systematic inventory of the artifact proveniences were kept. Edward Dowell's collection from the vicinity of the Lower Cimarron Spring camp site contains numerous artifacts related to the historic trail period and the later homesteading era. Beginning in 1987, Dowell documented the general site location of artifacts recovered from his metal detector surveys. This documentation consists of photocopies of aerial photographs of the area, where he has recorded his finds along with a short description of the objects. The recovered artifacts were stored in individual containers or sealed plastic bags with the provenience written on the containers with permanent ink.

In 1990 Kansas State Historical Society personnel conducted an archeological investigation of the interpretive display erected by the local chapter of the Santa Fe Trail Association (Stein 1990). These investigations revealed no significant artifact concentrations or features, although artifacts had been recovered from the area surrounding the interpretive display. An 1856 dime was recovered by Dowell within the enclosure prior to the archeological investigations; however, Dowell indicated that he found very few artifacts within the enclosure. During the archeological investigations, the Society archeologists concluded that the area within the enclosed display area had been seriously eroded by runoff from the pivot irrigation system to the northwest of the enclosure. A temporary holding pond had been constructed in a 200-m^2 area immediately west of the enclosure. The archeologists also examined this area and identified a few bone scraps.

National Park Service Archeological Investigations

During September 1993 the Rocky Mountain Regional Office (since reorganized as the National Park Service, Intermountain Support Office-Denver) of the National Park Service conducted additional archeological and historical investigations of the Lower Cimarron Spring camp site in order to reassess the NHL boundaries (Figure 5). These investigations included a photographic analysis of the site by James Walker of Brigham Young University and a hydrological study of the area by Edwin Gutentag, formerly of the U.S. Geological Survey. As part of the photographic study, Walker (1993) took low-altitude, large-scale aerial photographs of the spring site. Walker compared these photographs with aerial views of the area that were taken by the Agricultural Stabilization and Conservation Service (ASCS) between 1939 and 1991. Walker's analysis illustrated how the riverbed and other land features in the area have changed over the years. In addition, the 1939 aerial photographs



Figure 5. Santa Fe Trail ruts located within the boundary of the Lower Cimarron Spring camp site (view to the southwest).

revealed numerous wagon wheel ruts (14GT100) leading to a junction at the Lower Cimarron Spring camp site (Figure 6). Gutentag's (1993) study analyzed the hydrological characteristics of the area and determined the most likely location of the historic spring site.

Historical records also were used to help identify the location of the Lower Cimarron Spring. These records include the survey notes and maps of Joseph Brown, who mapped the Santa Fe Trail in 1825 (Wood 1983:Sheets 8 and 9), as well as a description of an icehouse that was constructed adjacent to the Lower Cimarron Spring by Grant County settlers Richard H. Joyce and J. W. Dappert in 1887 and a map of the change in the Cimarron River following the 1914 flood (Dappert 1944). In September 1993 National Park Service archeologists Steven De Vore and William Butler located the depression of the Joyce-Dappert icehouse on the northern bank of the Cimarron River (Figure 7). Walker's aerial photographs also showed the location of the icehouse depression (Figure 8). This area matched historical descriptions of the spring site; hydrological analysis also supported this identification. The area surrounding the Cimarron River in the vicinity of the spring site was mapped, and the icehouse depression, the edge of the Cimarron River, section and half-section fence lines, Santa Fe Trail ruts, a row of trees associated with the Joyce homestead, and the artifact locations/concentrations identified by Dowell were demarcated and recorded during the mapping process (Figure 9). Based on Dowell's metal detecting, an area of approximately 171 acres was identified as containing artifacts related to the Santa Fe Trail traffic and the Lower Cimarron Spring camp site.

The National Park Service also conducted an analysis of the artifacts in Dowell's possession. Also analyzed were artifacts on exhibit at the Grant County Museum, including one display belonging to Dowell (Figure 10) and one display collected by another local amateur, William Purnell (Figure 11). Approximately 3,000 artifacts in seven functional categories (see Appendix) have been collected by Dowell at the Lower Cimarron Spring campground location (Sprague 1980-1981:251-261). The major functional categories include architecture (n=1183), commerce and industry (n=1,459), personal items (n=70), personal and domestic transportation (n=43), domestic items (n=40), aboriginal lithic artifacts (n=27), and miscellaneous items (n=117).

Although there are several items that are directly associated with the homesteading and ranching activities of the late-nineteenth and early-twentieth centuries, most of the artifacts in the Dowell collection are directly

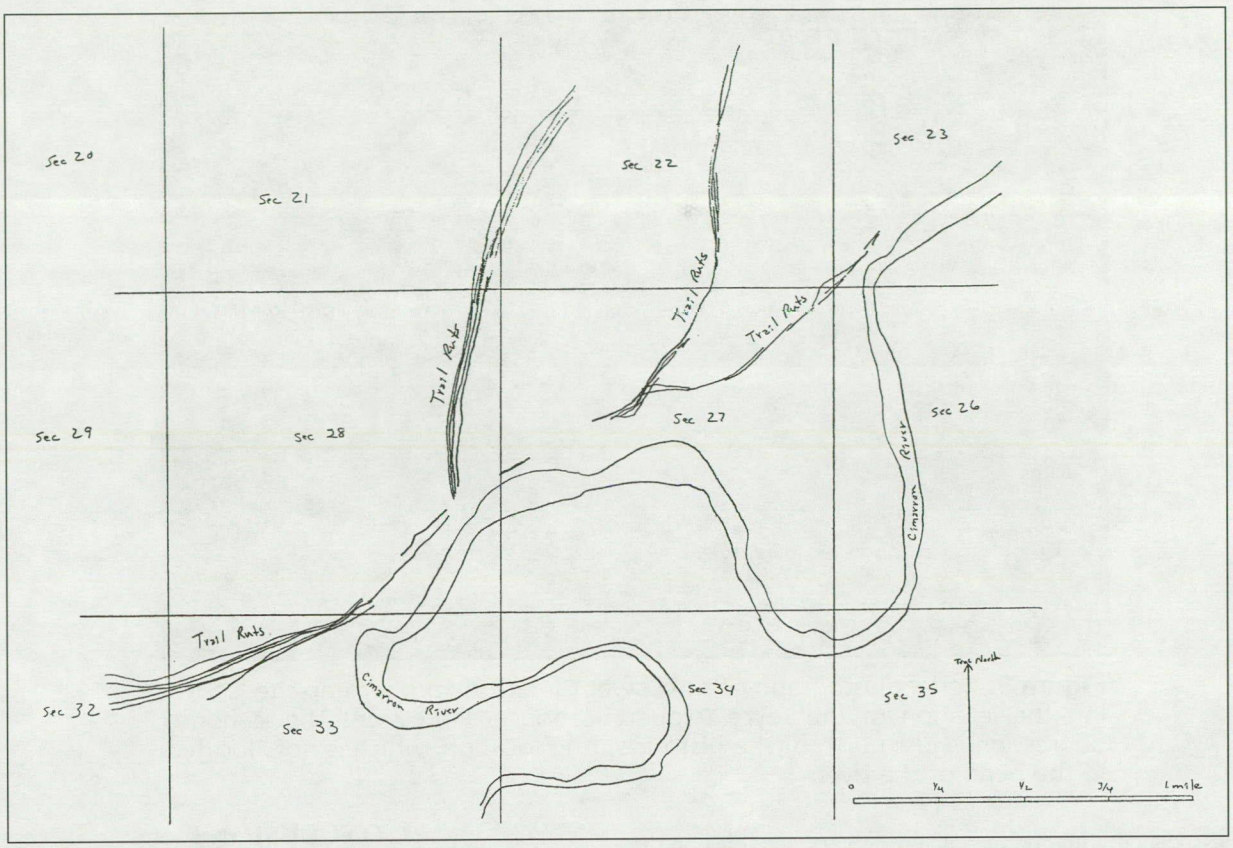


Figure 6. Santa Fe Trail ruts in the vicinity of the Lower Cimarron Spring camp site (adapted from the 1939 ASCS aerial photograph).



Figure 7. Depression of the Joyce-Dappert icehouse with the Cimarron River bend in background (view to south).

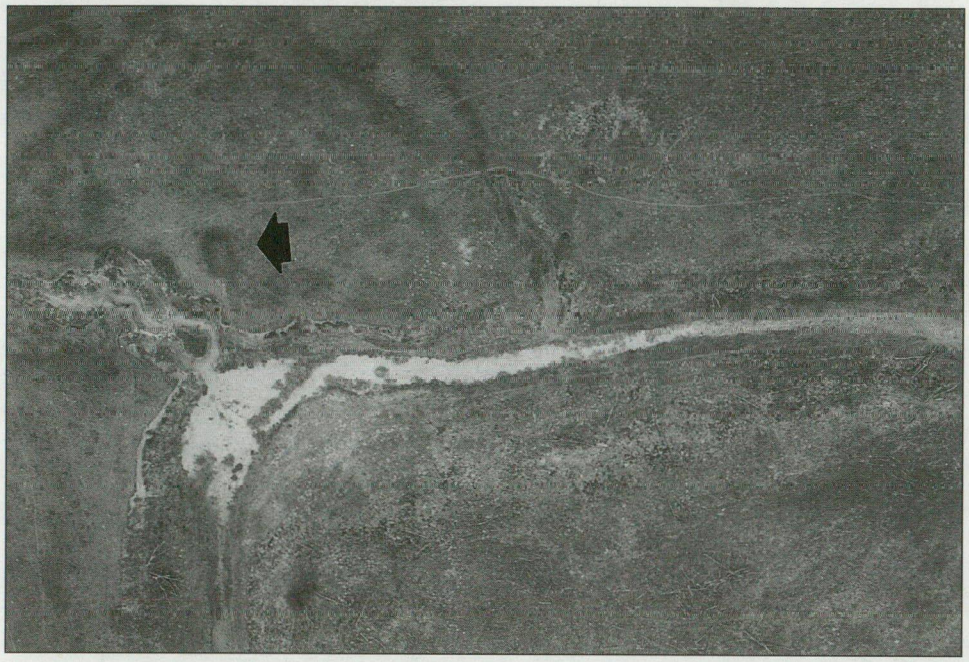


Figure 8. Aerial photograph of the Lower Cimarron Spring camp site, showing the location of the Joyce-Dappert icehouse depression. The icehouse depression is just north of the historic spring location, which is now located in the bend of the river.

associated with commerce and military activities on the Santa Fe Trail and at the Lower Cimarron Spring. Personal items include artifacts from the following categories: clothing, footwear, adornment, indulgences, ritual, pocket tools and accessories, and luggage items. Domestic items include furnishings, housewares and appliances, and cleaning and maintenance items. Architectural items consist of construction-related items. It is probable that several of these items (e.g., machine-cut nails and tacks, hand-wrought nails and tacks, and wood screws) are from wagons; however, without additional analysis it would be extremely difficult to distinguish their actual function. Personal and domestic transportation items consist of vehicle-related artifacts from wagons. The commerce and industry category includes agriculture and husbandry items, hunting-related artifacts, construction tools, commercial services artifacts in the form of coins, and manufacturing items. With the exception of .22 caliber bullets and casings and modern shotgun shells, the hunting artifacts are related to activities along the Santa Fe Trail during the nineteenth century. Miscellaneous metal artifacts consist of scraps, rod segments, rivets, grommets, hooks, and other unidentified items. The final artifact category in the Dowell collection consists of lithic artifacts of an aboriginal origin, which probably predate Euro-American exploration of the region.

Conclusions

Designated a National Historic Landmark in 1960, the Wagon Bed Springs site officially was recognized as possessing national significance, specifically for its association with the Santa Fe Trail. As a dependable source of water on a dangerously dry crossing, the spring was a major landmark for trade caravans as they crossed the open plains in what is now southwestern Kansas. The spring was on the trail's Cimarron Route (sometimes referred to as the Cimarron Cut-Off), which was the original and principal route of the Santa Fe Trail. The spring also was on the so-called *jornada*, the arid desert plain between the Arkansas and Cimarron rivers. Since the spring offered westbound travelers the first reliable source of water during their *jornada* crossing, it became a major resting point on the Santa Fe Trail. Numerous travelers recounted their immense relief, after crossing the *jornada*, of finding the cool, sweet, running water of the Lower Cimarron Spring. The spring's reliable source of good water also made it an important campground for the many American Indians who frequented the site, including the Kiowa, Comanche, Plains Apache, Cheyenne, and Arapaho (Barry 1972: 201-203).

As a result of this project, the Rocky Mountain Regional Office of the National Park Service (since

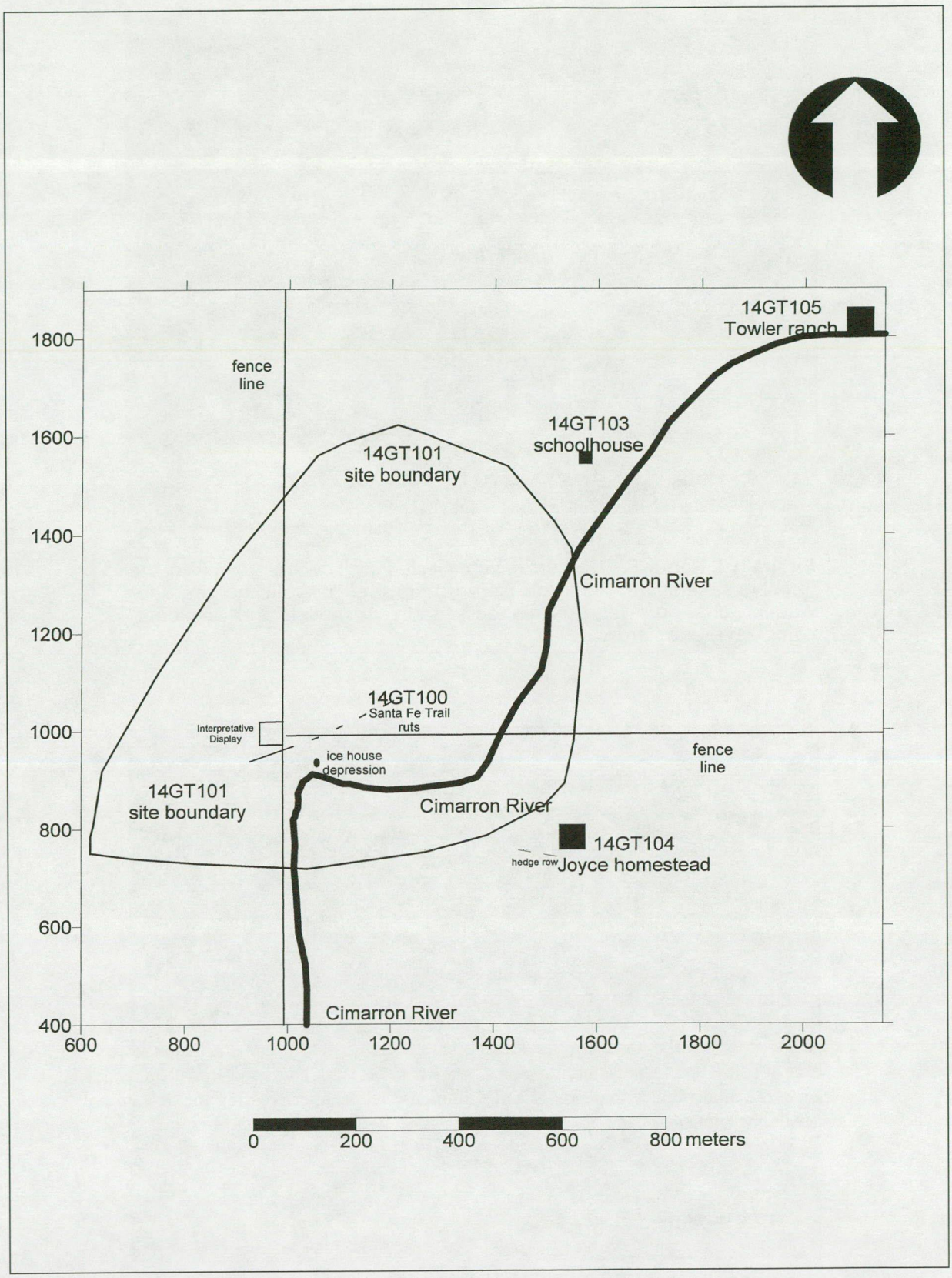


Figure 9. National Park Service survey map of the Lower Cimarron Spring camp site vicinity.

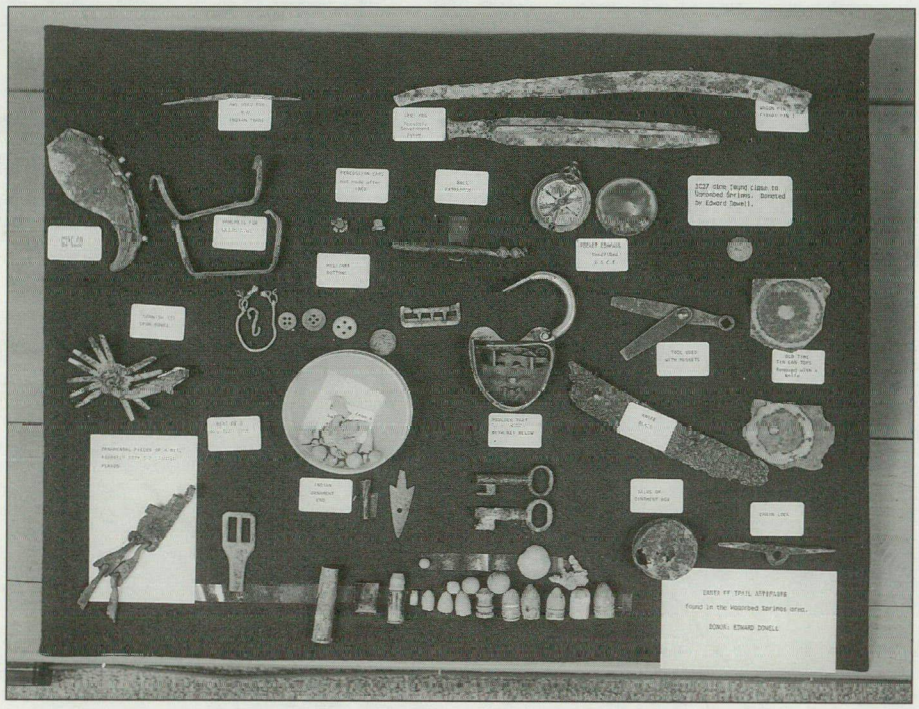


Figure 10. Santa Fe Trail artifacts collected by Edward Dowell in the vicinity of the Lower Cimarron Spring camp site. The collection includes wagon parts, horse and oxen shoes, food cans, bullets and cartridges, coins, keys, and hardware.

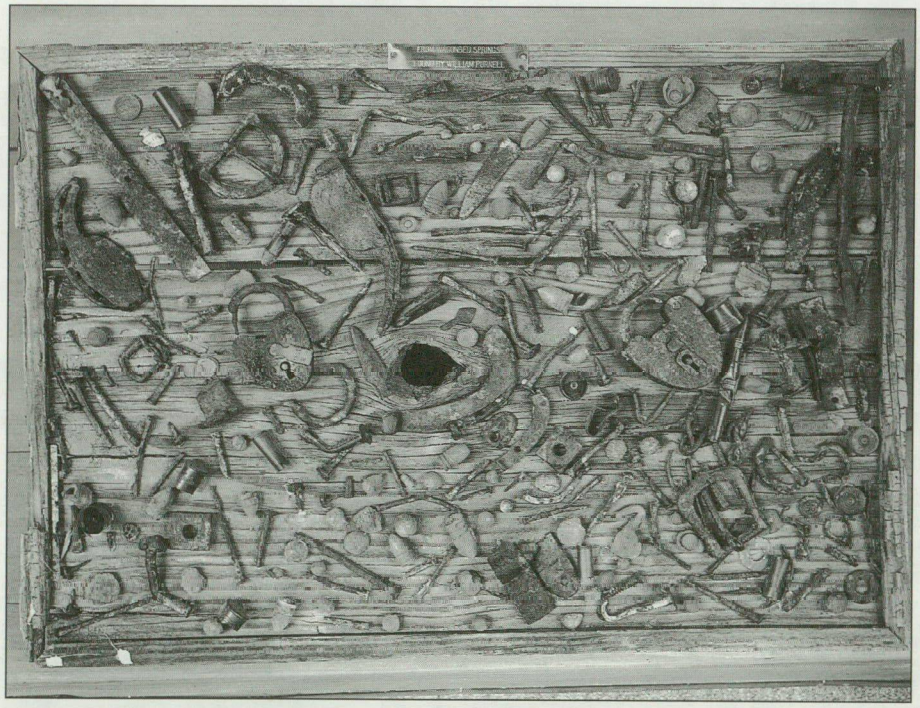


Figure 11. Santa Fe Trail artifacts collected by William Purnell on display at the Grant County Museum in Ulysses, Kansas.

reorganized as the National Park Service, Intermountain Support Office-Denver) completed a revised NHL nomination for Wagon Bed Springs. The nomination was reviewed by the Society for American Archaeology and the National Park System Advisory Board. On August 6, 1998, Secretary of Interior Bruce Babbitt approved the expansion of the NHL boundary to include the historic location of the spring, as well as the surrounding lands, which were found to have a high concentration of trail-related artifacts and which represent the area's historic use as a major camp along the Santa Fe Trail. The boundaries, which encompass 195 acres, also include numerous Santa Fe Trail ruts. The period of significance for the NHL is 1821–1873. The Mexican Revolution of 1821 opened commercial trade along the Santa Fe Trail. Beginning in the late 1860s, the westward advance of the Kansas Pacific Railroad (formerly the Union Pacific Railroad, Eastern Division) and the Atchison, Topeka & Santa Fe Railroad progressively shortened the Santa Fe Trail. In 1873 the Atchison, Topeka & Santa Fe arrived in Granada, Colorado, and the Santa Fe Trail's Cimarron Route was virtually abandoned.

In addition, the Secretary of Interior authorized the renaming of the NHL from "Wagon Bed Springs" to "Lower Cimarron Spring" National Historic Landmark. Lower Cimarron Spring is the site's historic name and its common moniker during the days of the Santa Fe Trail. "Wagon Bed" was retained as a secondary name, since the site is popularly known and referred to as Wagon Bed Springs.

Archeologically, the Lower Cimarron Spring camp site (14GT101) has yielded information on the campground activities associated with the Santa Fe commercial trade ventures; it has the potential to yield still more. Recovered artifacts indicate a vast array of activities associated with the spring and associated campground. Because of the specific and random nature of metal-detector surveys of the site, features associated with camping activities (e.g., hearths) have yet to be identified. The probability of their presence is extremely high since the site was used as a major camp location for more than 50 years.

Acknowledgments. The authors appreciate the assistance of Dr. William Butler, National Park Service archeologist, in the mapping of the Lower Cimarron Spring camp site. James Walker of Brigham Young University took the low-altitude, large-scale aerial reconnaissance photographs of the spring and campground site. Edward Dowell, a local resident and amateur archeologist who collected Santa Fe Trail-related artifacts in the area, provided the artificial evidence needed for the boundary revision study. Edwin D. Gutentag, a former U.S. Geological Survey hydrologist who is an expert in this region of Kansas, provided invaluable information of the spring location and its disappearance. Special thanks is extended to Harry Joyce, whose grandfather homesteaded the land on which the spring site was located, and to Lucille Towler Lewis, who lived near the spring and could recall the days when it was still running. Arnold Thallheimer took the photographs of the site and the artifacts as part of the NPS documentation of the site. John Conoboy of the Southwest Regional Office (now reorganized as the Intermountain Support Office-Santa Fe) of the NPS provided the funding and support for the project. The authors also acknowledge the support and assistance of the Santa Fe Trail Association members and numerous local Grant County residents.

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Appendix. Artifacts from the Dowell Collection

Personal Items	
Item	**Count**
Clothing	
Military Button	6
4-hole Glass Button	23
Other Button	6
Suspender Clasp	5
Footwear	
Leather Boot Heel	2
Adornment	
Jewelry	4
Metal Bead	1
Bobby Pin	3
Hair Beret	1
Tinkler	6
Carbine Belt Tip	1
Indulgences	
Clay Tobacco Pipe	1
Ritual	
Crucifix	1
Boy Scout Items	4
Pocket Tools and Accessories	
Pocket Knife	3
Watch Part	3
Luggage	
Trunk Part	1
Domestic Items	
Furnishings	
Furnishings	
Upholstery Tack	1
Decorative	
Picture Frame	1

Housewares and Appliances	
Culinary	
Cooking Knife	2
Cook Stove Part	2
Cooking Pot	5
Gastatory	
Table Utensil Handle	1
Hole-in-Top Can	8
Spice Can Lid	1
Faunal Remains	2
Mussel Shell	4
Bottle Glass	4
Home Education	
Paper Clip	1
Box Staple	1
Cleaning and Maintenance	
Sewing	
Straight Pin	2
Sewing Needle	3
Awl	2
ARCHITECTURE	
Construction	
Hardware	
Wall Hook	1
Machine Cut Nail	846
Hand-wrought Nail	134
Wire Nail	37
Hand-wrought Tack	33
Machine Cut Tack	89
Pointless Wood Screw	1
Wood Screw	3
Padlock	4
Door Rimlock	9
Door Latch	1
Key	2
Door Bolt	17
Door Hinge	1
Sash Fastener	1
Lead Sheet Fragment	4

Personal and Domestic Transportation	
Vehicles	
Chain Lock	1
Carriage Bolt	16
Wagon Strap	1
Felloe Plate	1
Wagon Hub	1
Wagon Button Hook	1
Wagon Box Staple	15
Miscellaneous Wagon Part	4
Whiffletree Plate	1
Whiffletree Hook	2
Commerce and Industry	
Agriculture and Husbandry	
Mexican Bridle Chain	5
Sleigh Bell	1
Mule Shoe	7
Oxen Shoe	1
Shoe Nail	88
Spur	4
Chain Link	5
S-chain	1
Harness Buckle	1
Harness Ring	6
D-buckle	3
Rectangular Buckle	6
Roller Buckle	15
Round Bridle	1
Snap Hook	1
Harness Hook	1
Tractor Gas Filter	1
Tractor Air Filter Band	1
Barbed Wire	6
Fence Staple	2
Hunting	
Lead Balls/Splatter/Shot	723
Lead Bullet	160
Center Fire Casing	12
Rim Fire Casing	8
Pin Fire Casing	1

Percussion Cap Container	1
Percussion Cap, Lined	9
Percussion Cap, Hat	9
Ramrod Ferrule	2
Lead Bar	1
Brass Tack	2
Trigger Plate	1
Trigger Guard	1
NW Gun Side Plate	2
Gun Tool	1
Shotgun Shell	9
.22 Cal Bullets	322
.22 Cal Casing	19
Metal Arrow Head	8
Construction	
Architecture	
Saw	1
Utilities	
Punch	1
Chisel	1
Auger Bit	1
Commercial Services	
Monetary	
Coins	6
Manufacturing	
Retail Merchandising	
Lead Bale Seals	2
MISCELLANEOUS MATERIAL	
Metal	
Rod	5
Sheet Metal	4
Aluminum Foil	1
Aluminum Object	1
Strap Metal	16
Brass Sheet	1
Roller	1
Clip	1
Square Rod	1

Fine Rectangular Wire	4
Hook	1
Eye Strap and Rod	1
Ferrule	2
Wire	2
Riveted Metal	4
Rivet	15
Grommet	3
S-hook	1
Clamp	4
Miscellaneous Metal	49
ABORIGINAL LITHIC ARTIFACTS	
Chipped Stone Tools	
Side Scraper	1
Corner-Notched Projectile Point	1
Lithic Debitage	
Debitage	25

NOTES

From the Plains and Back Again

James H. Gunnerson
University of Nebraska State Museum

The Kansas Anthropologist 19:37–61

The author traces his interest in Plains archeology from the time he was 10 years old, through his college years in the 1940s and early 1950s at the University of Nebraska, and to his subsequent graduate work at Harvard. Midway through the latter he was diverted to Utah archeology for six years. After completing his Ph.D. in 1963, he returned to Plains archeology, first while at Northern Illinois University and finally after returning to the University of Nebraska as museum director in 1974. During much of his professional career, he has collaborated with his wife, Dr. Dolores (Dee) Gunnerson. Most of their research has focused on the Apaches of the Plains.

Nebraska: Early Years

My initial interest in Plains archeology can be attributed to my father's general interest in everything related to history. He was born and grew up in Hamilton County, Nebraska, near the Platte River. There he picked up Indian artifacts on the farm and remembered Omaha Indians asking his mother for ground coffee while moving west on their buffalo hunts. He liked visiting museums and archeological excavations, and he took me along. At the age of about five, I was taken to the University of Nebraska State Museum, then in its third home — just south of the present Hamilton Hall. Shortly later it was moved into Morrill Hall, now commonly called "Elephant Hall." My first visit to the Nebraska State Historical Society Museum was when it was still housed in the university library building, now Architecture Hall. When this museum moved to the first floor of the state capitol building in 1932, Father helped as a volunteer. Father's interest in museums and history led him to found the Hamilton County Historical Society Museum in Aurora, Nebraska, my home town.

The year 1933 was influential in the shaping of my future career, although I did not realize it at the time since I was only 10 years old. My father had been elected to the Nebraska State Legislature, and we moved to Lincoln in January, where we rented a small apartment near the capitol building. My father was conscientious about visiting the state institutions in and near Lincoln and often took me along. Since he had a special interest in history and archeology, he paid extra attention to the Nebraska State Historical Society and the University of Nebraska. He had known E. E. Blackman, the curator of the Historical Society Museum and the first Nebraska state archeologist. Father had even rented a room from the Blackmans while he served on a grand jury in Lincoln in the fall of 1932. Mr. Blackman also had been our house guest.

In addition to acquainting me with Mr. Blackman, Father introduced me to several other interesting people. Dr. Erwin H. Barbour, a Yale-trained paleontologist, was the director of the University of Nebraska State Museum. Dr. Earl H. Bell out of the University of Chicago was the anthropologist/archeologist in the university Department of Sociology. John L. Champe, who had yet to become a professional anthropologist, had developed an active interest in Nebraska archeology. Dr. G. H. Gilmore, a semi-retired medical doctor from Murray, Nebraska, had a strong interest in eastern Nebraska archeology inspired by his late brother, Walker Gilmore, after whom the deeply-buried site on Sterns Creek was named. After initial introductions, I occasionally would visit on my own some of these people, especially Mr. Blackman and Dr. Barbour. I did not realize until many years later why these scholars were so cordial to a 10-year-old — 1933 was a very difficult budget year for the state institutions.

In the early spring of 1933, I had a special experience in archeology. On a cold wet day, Dr. G. H. Gilmore took Father, with me tagging along, to visit the Walker Gilmore site near the Missouri River east of Lincoln. This stratified Woodland site had also attracted the attention of Dr. Frederick Sterns and Dr. William Duncan Strong. Since I was the smallest in the Gilmore party, I had a rope tied around my waist and was lowered over the steep cut bank of Sterns Creek, named by archeologists after Dr. Sterns, to try to find any detritus associated in the buried strata.

A few months earlier, I had accompanied Mr. Blackman and Father to the Pawnee site near Clarks, Nebraska, where they put a test pit into a suspicious

depression that turned out to be an earthlodge. One highlight of my 1933 visits to the University of Nebraska was being invited to tea in Dr. Bell's anthropology lab in Bessey Hall, where anthropology returned 60 years later.

Other university memories include Dr. Barbour's introducing me to sketching an insect with the help of a projection microscope, identifying common minerals by examining streaks on ceramic tiles, and identifying various fossil teeth. The paleontology preparation lab, which was especially interesting, was made even more so through the attention of the colorful Henry Reider. A few years later while in high school, I assisted in removing parts of a mammoth skeleton that was reported to Father, who in turn reported it to the University Museum. Reider was sent out to excavate it, and with his direction I prepared the two partial tusks and a scapula. These in turn were deposited in the Hamilton County Historical Society Museum.

Another office where I was introduced and frequently visited was the state chemistry laboratory, then on the first floor of the capitol building. This laboratory was devoted primarily to the testing of such things as autopsy samples from probable murder or suicide victims, ice cream for butter fat, and gasoline for octane rating. In any case, this exposure to chemistry, with the gift of a couple of test tubes from one of the chemists, apparently made a greater impression on my thoughts of a career than did the archeology-history-paleontology contacts. I had developed an interest in the latter three, but it took me a long time to think of them in terms of possible lifelong professions. The interest in the physical sciences was reinforced by my most influential high school teacher, Ronald J. McKinsey, and by an excellent chemistry teacher, Miss Louie Murphy.

The University of Nebraska

When I entered the University of Nebraska in the fall of 1941, I declared a chemical engineering major. However, I soon discovered that the department consisted of only one professor, so I switched to a straight chemistry major. I was aware of anthropology, especially archeology, so when I needed to take some courses in the social sciences, I chose anthropology. Since these were interesting, I chose additional anthropology courses as electives. In 1948 the University of Nebraska held an archeological field school. This sounded even more interesting, so I enrolled, even though I did not need the credits. By the end of my junior year, I was not sure whether I wanted to continue in chemistry or switch to anthropology. I decided to finish my chemistry B.S., earn an M.A. in anthropology, and then decide between the two for my Ph.D. — anthropology won.

I never regretted switching fields, but I also never regretted the engineering/ chemistry/physics background. The exposure to the rigor of the hard science methodology has been beneficial, and the chemistry degree came in very handy when seeking employment during my student days. Most important, however, was my meeting Dolores (Dee) Bellamy in a chemistry lab early in our freshman year in 1941 (Figure 1). We were married in January 1944, and she was with me the last two years of the time I was in military service, mainly in Florida. When we reentered the University of Nebraska after World War II, she decided to drop chemistry and go to stronger interests, English and anthropology. She continued in anthropology for graduate work. All through our careers in anthropology, our research has been closely related; rarely have I been in the field doing archeology when she was not with me.

The person who was most responsible for my shifting from chemistry to anthropology was Dr. John L. Champe. While William Duncan Strong was professor of anthropology at the University of Nebraska between 1929 and 1931, he charmed Champe into archeology. Champe had participated as a volunteer in various ways in Nebraska State Historical Society and University of Nebraska digs. He had had a career in the insurance business before he returned to a university, this time to Columbia to earn a Ph.D. in anthropology under Strong.

Champe replaced Earl Bell at the University of Nebraska in 1940 and soon established the Laboratory of Anthropology. Even before he became a professional anthropologist, he was very much interested in the "direct historical approach to archeology," which was introduced into Plains studies by Strong and championed by Dr. Waldo R. Wedel. Champe also had started collecting photostats of historic maps, especially French, which provided clues to the locations of various Plains tribes and their villages. His collection, now in the Nebraska State Historical Society, whetted our interest in historic maps, but our emphasis has been on the area centering on the frontier between the Plains and the Southwest. There is some duplication between the two collections, but they do nicely complement one another.

Perhaps the most important thing that Champe taught us was research design. He stressed "problem-oriented" and well documented research rather than mere descriptive papers, even for undergraduate term



Figure 1. Dee and Jim Gunnerson, University of Nebraska Laboratory of Anthropology, 1949.

papers. Anthropology in the late 1940s was still a part of the Sociology and Anthropology Department, but the establishment of the Laboratory of Anthropology by Champe gave it an identity of its own. It had separate space, first in the basement of Love Library and soon in the basement of the new Burnett Hall.

When the Smithsonian's Missouri River Basin Survey (MRBS) was established in 1946, it was first headquartered in the Laboratory of Anthropology. This gave us an opportunity to meet archeologists associated with the MRBS, such as Waldo Wedel, Frank H. H. Roberts, Paul Cooper, Marvin Kivett, Don Lehmer, Wesley Bliss, Richard Wheeler, Jack Hughes, George Metcalf, Met Shippee, and others, plus paleontologist Ted White. In this hot bed of archeological activity, we also learned a lot concerning governmental complexities, institutional rivalries, personal intrigues, and professional jealousies things every young archeologist should know about.

The Plains Anthropological Conferences were resumed in 1947, with the fifth meeting held at the University of Nebraska. This gave us a chance to at least meet most of the archeologists having an interest in Plains archeology.

Several of the pioneers in Plains archeology whom I failed to meet in my "formative" year, 1933, I met later. I became acquainted with A. T. Hill shortly after he replaced Blackman as curator of the Nebraska State Historical Society Museum in November 1933. While I was in high school, I would get to Lincoln occasionally and would drop in and visit Hill as well as Barbour and Reider. I had another more specific association with Hill in that I wrote and published the report on the last field work for which he was responsible the 1949 excavations by the Society along the Middle Loup River near Mullen, Nebraska (Gunnerson 1960b). By then his health was failing, and Marvin Kivett directly supervised the field work. My wife and I visited Hill in his home in Hastings not long before his death.

From the late 1940s on, we kept in contact with Waldo Wedel, first in Lincoln in the MRBS laboratory and later in his office at the Smithsonian Institution and at his home in the Washington, D.C., area. He and his ethnohistorian wife, Mildred, were guests in our home and we in theirs; we visited each other's digs. We never did get well acquainted with Strong, meeting him mainly at professional meetings.

In the late 1940s Dr. Frederick Sterns, who had dropped out of anthropology after getting his Ph.D. at Harvard, returned briefly to Nebraska, and we had the pleasure of visiting sites along Sterns Creek with him. While at Harvard in the early 1950s, I studied and published on pottery collected by him along the Missouri River in southeastern Nebraska between 1912 and 1915 (Gunnerson 1952).

Special recognition must be given to George Metcalf for his part in educating Dee and me in the history, or more correctly, the lore of Plains archeology. Metcalf was not a college-trained archeologist, but he had been professionally employed since Works Progress Administration (WPA) days in the 1930s and had nearly 50 publication credits by the time he retired. He did receive an honorary doctorate from Luther College in 1970 (Gunnerson and Gunnerson 1977). Metcalf was an excellent observer of people and their foibles, was an outstanding raconteur, had an excellent memory, and was our delightful, frequent Saturday dinner guest during the last couple of winters we were in Lincoln.

While students at Nebraska, we also were exposed to scientists in other fields relevant to archeology. The Geology Department included C. Bertrand Schultz, W. D. Frankforter, A. L. Lugn, and Gilbert Lueninghoener, all of whom were working on dating buried soils and river terraces in central Nebraska. The two most recent of the terraces, especially in the Republican River drainage, contained evidence of human occupation buried up to 50 feet. The evidence for marked climactic changes was inescapable. The Conservation and Survey Division of the University of Nebraska, under the leadership of G. E. Condra and Eugene Reed, also was concerned with soils, as well as terraces. The Geography and Botany Departments were very much into the study of Plains environment, especially as reflected in plants, with such noted scientists as Drs. Bessey and Weaver having led the way. Paleontologists in the University of Nebraska State Museum were interested in Pleistocene fauna and in the identification of bones from archeological sites. Harry Weakley was doing pioneering research on Plains dendrochronology. Although he was not employed by the University of Nebraska, he worked closely with various faculty members. In short, human ecology with its application of archeology was perhaps as much emphasized on the Lincoln campus as anywhere in the country.

The Lure of Field Work

In the spring of 1948, Wedel, then MRBS director, invited the University of Nebraska to investigate sites to be flooded by the Harlan County Dam just southeast of Alma, Nebraska. Of special interest was White Cat Village (25HN37), a Dismal River (Apache) site, on Prairie Dog Creek (Figure 2). Champe quickly organized an archeological field school, rounding up shovels, trowels, etc. that were left over from WPA projects of the late 1930s and camping equipment that had been used by Roberts at his excavations at Lindenmeier. There had been a farmstead at the edge of White Cat Village, and although the buildings had been removed, there remained a good well, a storm cellar that served as a dark room, and an inviting grove of trees an ideal setting for a field camp. In fact, the same location was

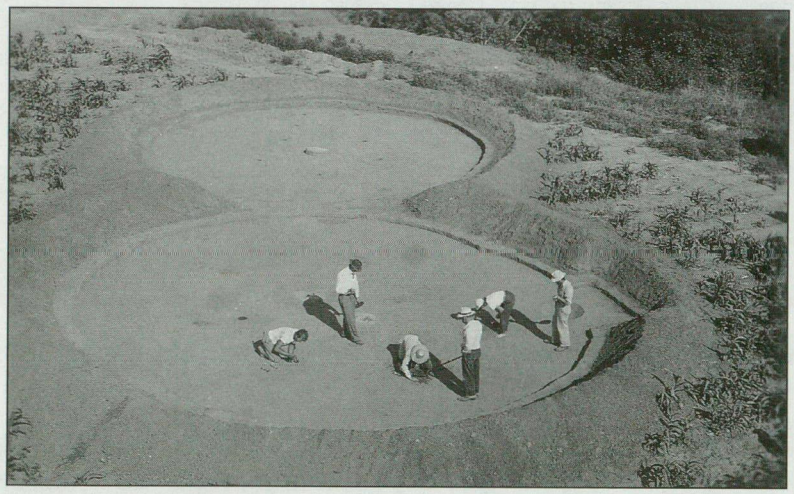


Figure 2. University of Nebraska field school at White Cat Village, Harlan County, Nebraska, 1948.

used during the four years that we were involved and as long as the University of Nebraska continued to work in the area. In 1948 there were no students on the crew with field experience, so with our previous interest my wife and I served as field assistants and immediately found field work to our liking (Figure 3). During our association with the field school from 1948 through 1951, we were entrusted with increasing levels of responsibility.

My part-time employment with the University of Nebraska Stores system proved to be useful in equipping the field schools since the Stores handled the large amount of Army surplus material that was available to the university. I knew the various individuals involved and frequently was able to get first choice of useful items. Also, I was able to have them watch for surplus we could use. Included were such items as tents, cots, mattresses, blankets, ponchos, electric generators, kitchen ware, tables, folding chairs, airplane mooring stakes, hand tools, and even first aid supplies.

The field schools, always coeducational, were not restricted to digging at White Cat Village. Other nearby sites investigated included Upper Republican, White Rock, Woodland, and a possible Archaic one. There was usually a side trip to digs in South Dakota or Kansas and always to the University of Nebraska State Museum Paleoindian digs in Frontier County. Included were visits to digs of the Smithsonian Institution, the Nebraska State Historical Society, and the University of Kansas.

In 1951, after my first year at Harvard, I was asked to return to Nebraska for the summer and run the dig in Harlan County. White Cat Village proved to be very significant in the understanding of the Dismal River aspect, attributable to the Plains Apaches of the late 1600s and early 1700s. In 1949 the Nebraska State Historical Society, as a WPA project, excavated at the Lovitt site (25CH1) in the southwest corner of Nebraska (Hill and Metcalf 1941). This site was larger than White Cat Village, but the structures were not as well defined. A report of the first two summers work at White Cat provided the basis for my M.A. thesis (Gunnerson 1960b), published by the Smithsonian and later reprinted. This involvement in Dismal River archeology led to a lifelong interest in Plains Apache research, for me from an archeological point of view and for Dee from an ethnohistorical perspective. Working from Spanish documents, Dee established that the southern Athapaskans arrived on the Plains edge of the Southwest in circa 1525 (D. Gunnerson 1956) and traced their subsequent



Figure 3. Dee Gunnerson demonstrating shovel technique to field school students, Harlan County, Nebraska, 1950. Jim Gunnerson is at far left.

movements. The history of those Apaches who had occupied White Cat Village, as well as the Lovitt and the Scott County, Kansas, (El Quartelejo) sites, was worked out in detail by the two of us (D. Gunnerson 1974; Gunnerson and Gunnerson 1971, 1988; J. Gunnerson 1984, 1987, 1992).

One house at White Cat Village was especially rewarding since it had burned while still occupied. In addition to the basic five-post support, we found small stains from the perimeters of the structure that apparently represented the bases of wall poles leaned against the central posts. One of the center posts yielded a good dendrochronological date of A.D. 1723. The most unusual artifact from this structure was an iron ax head, which had been driven into the hearth, the handle toward the door (Figure 4). We speculated that an enemy, probably a Pawnee, raided the village, drove his ax into the hearth as a "calling card," and set fire to the lodge. We know from historical documents that at this time and even a few years earlier, the Paloma Apaches, living north of the Platte River, and the Quartelejos to the south, were under heavy attack from the Pawnee. These, along with the French (also from the east) and Comanche from the west, soon forced these Apaches to abandon the Plains.

One Upper Republican house at 25HN44 in the Harlan County Lake area was of special interest. It proved to be the largest one excavated to that time and probably even yet. We had no problem in following the row of outside wall post molds, but we could not at first identify the center post molds. We did expose large stains that we assumed were cache pits until we noted that the six of them formed a symmetrical pattern around the hearth. Upon coring them, they did prove to be molds for enormous center posts that had been set more than 3 feet deep. It then made sense that such a large earthlodge would need larger center posts and more than the usual four. Artifacts were sparse but did include a bird effigy pipe. One could speculate that the structure had some special function, especially since it was within sight of the Graham ossuary, where Strong (1935) reported finding Southern Ceremonial Cult items.



Figure 4. Waldo Wedel examining iron axe in situ at White Cat Village, Harlan County, Nebraska, 1949.

Another Upper Republican site (25HN11) had an unusual feature. Here in the bottom of a subfloor cache pit was a second pit, which we suggested was for secret hiding. Feather fragments came from the lower pit and may have had some significant meaning. Still another Upper Republican site (25HN36) yielded part of a human skull that had been cut and drilled.

Through our four years at White Cat Village, camp life slowly changed. Tents went from white-wall tents, which had seen service with Roberts at Lindenmeier, to ancient World War I pyramidals, to extra-strong World War II surplus. Initially, Flavia (Mrs. John L.) Champe did the cooking with the help of crew members on a three-quarter size wood-burning range, called "Flash." Later we graduated to bottled gas and hired cooks. Next to Flavia, the best-loved cook was "Miss Lula," who cooked for students at Alma's elementary school during the school year. She had a generous food budget and loved cooking for college students with appetites many times greater than those of her elementary students. She would even bake cinnamon rolls for the next morning's breakfast. Camp life, even though she lived in Alma and was picked up by a crew member every morning, was a new and educational experience for her. Also, her 60 years or so of small town naiveté, made her a good source of anecdotes.

The field school at the University of Nebraska in our time attracted a wide variety of students, both men and women. Several went on to receive M.A.s and four earned Ph.D.s, becoming professionals in anthropology or related fields. Some continued as avocational archeologists. Some were motivated, while others were not interested in archeology, only in getting the college credits. Some left no memories with us, while others were so colorful that we never will forget them.

As with digs in general, visitors were common at White Cat. In addition to locals, who were mainly interested in how a coeducational field camp operated, others truly were interested in what we were recovering. Visiting professionals from the Smithsonian, the National Park Service, and various institutions always were welcome (Figure 5). Some of the latter were accompanied by a group of their students (Figure 6). John Champe took great pains in insisting that our



Figure 5. Dee Gunnerson (foreground) and George Metcalf at White Cat Village, Harlan County, Nebraska, 1948.

excavations were always neat and highly presentable. He also insisted that the crew dress appropriately (Figure 7), so as to blend in with the local population.

Whereas the archeologists with the Nebraska State Historical Society and the University of Nebraska Anthropology Department primarily were concerned with late prehistoric and later complexes, the paleontologists with the University of Nebraska State Museum were interested in Paleoindian sites. In 1948 the Museum hired Preston Holder and wife, Joyce Wike, to excavate at the Allen site (25FT50), which was to be flooded by the Medicine Creek Reservoir in south-central Nebraska. Holder was replaced by E. Mott Davis to continue Paleoindian archeology in the reservoir at the Lime Creek and Red Smoke sites (25FT41 and 25FT42). Dee and I spent a couple of weeks as volunteers on Holder's crew and a few weekends volunteering at Davis' digs on Lime Creek.

In the summer of 1952, Davis was in the throes of completing his doctoral dissertation for Harvard.



Figure 6. Judith and Carlyle Smith with University of Kansas crew visiting the Nebraska dig, Harlan County, Nebraska, 1949.



Figure 7. Dee Gunnerson ready to go to town for groceries, University of Nebraska field school, 1948 or 1949.

Since rising waters of the Medicine Creek Reservoir were threatening sites, it was necessary to continue excavation at the Red Smoke site (Figure 8). To provide additional free time for Davis, I was hired to supervise excavation at Red Smoke under his general direction. When I arrived in Lincoln, all preliminary plans were made, equipment was selected and stacked, and a crew was hired. In addition to mainly high school boys, the crew contained a geology student as cook/paleontologist and a college student, who had previously been at White Cat Village with me, as photographer. As might be expected, one of the high school students did not fit in with the rest. He felt sorry for a fish that he caught, so he put it into our drinking water barrel, and he spent his spare time talking to some nearby horses. He was not a good digger, and when I discussed his situation with him, he became very homesick and wanted to be taken home that night. By the next morning I was back with the crew after driving all night. Another low spot that summer was when one crew member got into poison ivy and had to be hospitalized for several days. I think he liked the attention of the nurses better than digging.

Excavating at this deeply buried site along Lime Creek gave me experience using a bulldozer and an even larger earth-moving machine. On August 4th word came via a nearby rancher that I had become the father of a son, so I quickly returned from Cambridge, Nebraska, to Cambridge, Massachusetts,

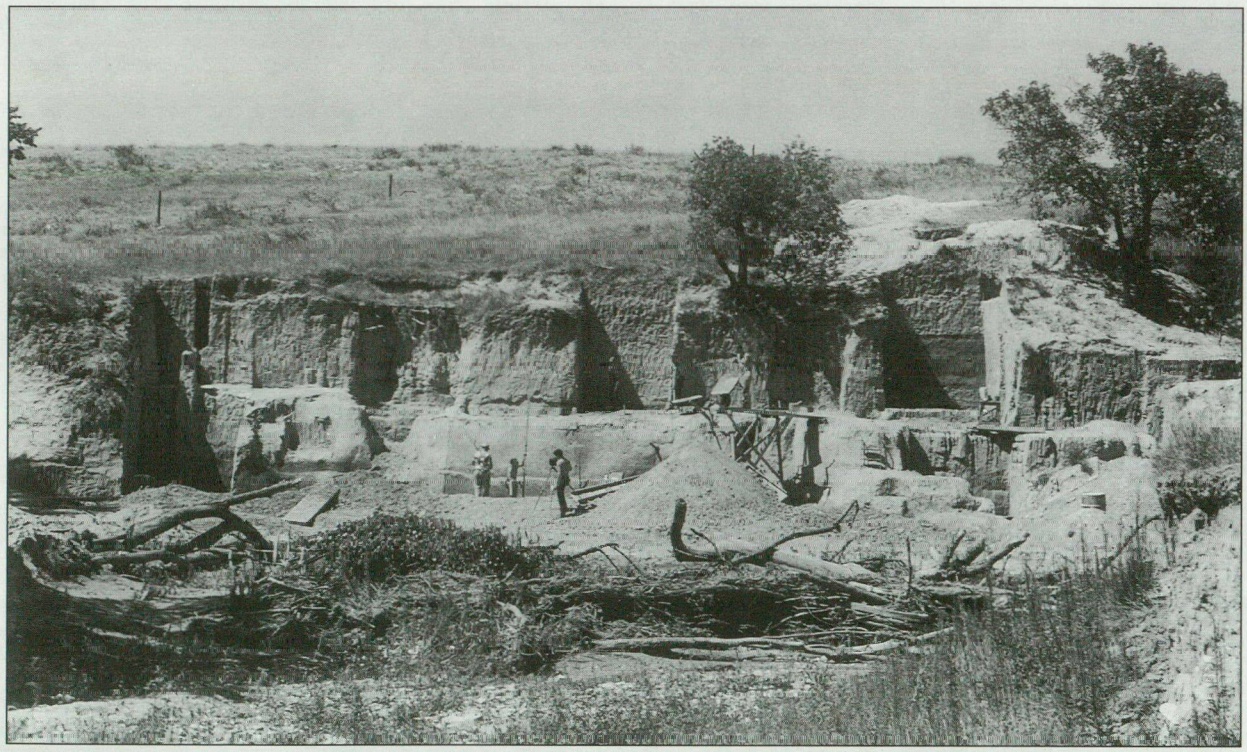


Figure 8. University of Nebraska State Museum crew members recording a deep profile at the Red Smoke site, Frontier County, Nebraska, 1942.

and Mott Davis took over for the last few days of the summer's dig.

In our student days at the University of Nebraska, Dee and I were involved in a variety of archeological activities in addition to classes, field schools, and volunteering at Paleoindian sites. In 1948 after our first field school, we surveyed four small proposed reservoirs for the university in cooperation with the MRBS (Gunnerson and Gunnerson 1952). We also checked out sites reported to the university, and helped examine human skeletons for county sheriffs. Once we and a few others spent all one night salvaging what we could from Oneota cache pits in southeastern Nebraska. A contractor, who was moving dirt for a levee, would stop work only until daylight so we could dig. He did provide portable floodlights. We also volunteered to help excavate at the Walker Gilmore site.

As part of my M.A. thesis research in 1949, Dee and I made a sweeping trip through southwestern South Dakota, southeastern Wyoming, eastern Colorado, western Kansas, and western Nebraska, examining museum and private collections in an attempt to determine the geographical distribution of Dismal River sites. We discovered that we should have included northeastern New Mexico, but we were not cleared to take the university vehicle there. New Mexico had to wait until 1957 and later.

HARVARD

As work on our M.A.s progressed, the choice of a Ph.D. department came next. Champe (Columbia) and Davis (Harvard) each favored his own university, although Champe also had Dr. J. O. Brew, a Harvard professor, as a personal friend. At Plains Conferences we became well acquainted with Brew and Jimmy Griffin of the University of Michigan, the third university we were considering. We knew Jack Roberts, who was working part-time at the University of Nebraska while finishing his Ph.D. at Yale, but after looking at the extensive Yale application form, we decided against applying there. We held off on applying to Arizona, a fourth choice, since it had a later closing date.

We both were accepted at Harvard, Columbia, and Michigan, but the only offer of a scholarship came from Harvard (Radcliffe) for Dee. After arriving at Cambridge, we concluded that we could not live on what I had left of the GI Bill plus Dee's scholarship, and Harvard did not permit graduate students to be employed during their first two years. Dee made the sacrifice, declined her Dana Scholarship, withdrew her application to Radcliffe, and went to work at Massachusetts General Hospital, later moving to the Library of the Museum of Comparative Zoology at Harvard. At Massachusetts General, Dee made use of her knowledge of German to admit and make initial assessments of foreign refugees in the outpatient ward. Even though the refugees were from various European countries, many of them had learned at least some German. At the Museum of Comparative Zoology, she used her knowledge of both German and French to reinstate exchanges of scientific publications with foreign institutions that had lapsed during World War II.

Requirements in anthropology at Harvard were in some ways quite relaxed. Graduate students had to pay tuition for two years of residence, but there were no required courses. Students soon learned, however, that they would be examined in several particular areas. Everyone would be responsible for the basic four fields on a theoretical basis. In addition, all would be examined over European and North American anthropology. In my particular specialty I also would be responsible for in-depth knowledge of all New World archeology and ethnography and one other geographical area; I chose Oceania. How students acquired the information was up to them. In general, graduate students would conscientiously audit about as many classes as they took for credit. Since registration did not take place until the end of the first two or three weeks of the term, we would sit in on several courses and sign up for credit for those that sounded most interesting and in which we could expect to do well. Occasionally, when a particular course had not been offered recently, a group of students would organize it and talk a faculty member into supervising it as a seminar.

In addition to Brew, who was my major advisor, I took for credit or audited courses given by Stanley Garn, Hugh Henchen, E. A. Hooton, W. W. Howells, Hallam Movius, Douglas Oliver, Marvin Opler, John Pelzel, Clyde Kluckhohn, Philip Phillips, John Roberts, Demitri Shimkin, Evon Vogt, Gordon Willey, and Stephen Williams. It was not uncommon for these members to bring in guest lecturers of comparable stature. There also were visiting scholars, some more or less permanent, around Harvard much of the time. These would often present special lectures in the area of their specialty. Of course, graduate students also learned much from each other.

When faculty members were not going to be able to meet classes, they would arrange for a suitable guest lecture. For example, when Kluckhohn was out of town, which happened frequently, he arranged for

such guests in his social anthropology class as Peter Murdoch, Ralph Linton, and Alfred Kroeber, in addition to other anthropologists and sociologists on the Harvard faculty. Hooton rarely missed a class, but he did bring in various specialists, especially in the fields of dentition.

Utah

After completing the two years of formal class work for the Ph.D. and devoting part time to anthropology at Harvard for an additional two years, I decided that it would be better if I devoted full time to anthropology. In 1954 I took a position at the University of Utah as field director of the Utah Statewide Archeological Survey. I also had the title of curator in the Department of Anthropology Museum, and I taught an occasional course. This gave me a great deal of research experience in an area outside of, but related to, the Plains and a substantial list of publications.

Prior to our survey and excavations in the Fremont Culture area of eastern Utah, relatively little intensive work had been done on this enigmatic and exotic complex. Survey, excavation, and publication had been spotty, and no overview of the entire Fremont problem had been presented. Although my suggested interpretation of Fremont culture origins, florescence, and demise has attracted a lot of criticism (Gunnerson 1960a, 1962, 1969b), I still believe that no one else has proposed an interpretation that better accounts for all of the relevant data.

Experiencing the dim trails and the eccentricities of the Utah weather frequently led to unexpected excitement (Figure 9). Flash floods in canyons were a new experience for us. Raised on the Plains, it was fascinating to watch the approach of a wall of water moving huge boulders, even when we were not in danger. We also learned not to believe completely the local old-timers, who assured us that a particular stream would not flood at a particular time of year, only to find water suddenly flowing through our tent. Another time our local wrangler was quite amused by my parking our vehicles on high points, while he left his truck in a small side arroyo, where it had been convenient to unload the horses to take our equipment on down the Escalante River canyon. By the time we returned, water had not gotten to either of our vehicles, but it had been three feet deep around his truck. Traveling on narrow "dugways" (roads carved into the canyon walls on mountains) were also experiences to remember, as were washouts without barricades across roads and roads shown on maps where none existed. Following a new road down an incline that was too steep to go back up and having no idea where the road led was an adventure. Once we followed Jeep tracks along a trail until we were stuck in the sand miles from the nearest town. Fortunately, after walking a couple of miles, I found the Jeep that had made the trail. Its driver, too, had a problem: he did not have enough gasoline to get to the nearest town. I gave him gasoline, and he pulled us out of the sand trap. We did find everyone that we met in the



Figure 9. Dee, Jim, and son Jimmy Gunnerson, in Robber's Roost area, Wayne County, Utah. Horses went where pickups could not.

field to be most friendly and helpful. We kept in touch with some of these people for years.

One of the more memorable summer field sessions in Utah was 1958, spent on the Kaparowits Plateau as part of the Glenn Canyon Salvage Program (Gunnerson 1959a). There were numerous Pueblo II - Pueblo III sites on the Kaparowits, which had been only briefly surveyed before. As a youth in 1928, Clyde Kluckhohn (1933) and a few of his buddies had spent a little time on the plateau, which he called Wild Horse Mesa, and briefly described a few of the sites. This was Kluckhohn's earliest personal contribution to archeology, as well as the earliest mention in print of the sites. In 1937 the Rainbow Bridge-Monument Valley survey of the University of California had visited a few sites on the Plateau (Beals, Brainard, and Smith 1945).

The sites on the Kaparowits were not threatened by flooding, but they did prove to be significant in the interpretation of sites that would be flooded. Also, it was assumed that they would be at risk from visitors once Lake Powell became a recreational attraction. The plateau rarely was utilized for either grazing or hunting, since access to it was by two poor, unmaintained trails up the nearly vertical half-mile-high north face (Figure 10). The better of the trails was so bad that in places our wrangler would get off his horse and walk, and one of our pack mules fell off the trail. The mule was rescued, but we had made the mistake of putting all of our two-week supply of eggs in its pack.

Camps were very primitive, consisting of a small supply tent and a canvas tarp stretched between two trees. Our wrangler/cook knew the locations of two small springs, which we were able to develop. Most of his cooking was done in a Dutch oven and giant coffee pot. Sourdough bread, mixed in the top of the flour sack, awaited us at supper time with enough left for breakfast and sandwiches the next day. Meat consisted mainly of venison stew, also cooked in the Dutch oven. I gained respect for sourdough bread and Dutch oven cookery. Deer were fairly common on the plateau, and the wrangler would shoot one occasionally. The meat was hung out to cool each evening and wrapped up in a canvas tarp and left in the shade during the day. The first couple of days it was quite tough, but in about a week it became tender.

Fortunately for us, the basic land survey was being carried out the summer that we worked there. Even though survey monuments were set only every half mile around each township and around each school section, they did provide fixed points to which we could tie our plane table maps. The surveyors were using helicopters to reach the plateau top from their base camp at its foot, so we would watch to see where they landed and then in the next day or so



Figure 10. An easy section of the trail to the top of the Kaparowits Plateau (on skyline), Kane County, Utah, 1958.

locate the new corner. One amusing incident did occur with reference to the survey. Hardly had the cement set but I located the corner and copied down the information stamped into the brass cap, noting that the designation was impossible. The next time we went to town, I stopped at the survey base camp and showed the crew chief my drawing of the cap. He pointed out how careful they were not to make mistakes and insisted that I had miscopied. He did agree to have the cap rechecked, and the next time I went past, it had been corrected. Perhaps his crew thought that the area was so remote that nobody would ever look for the corner and got a little careless. At that time our best United States Geological Survey map was at a scale of 1:250,000, which was useless in the plotting locations for more than 250 sites within an area of about 20 square miles.

Trips to the nearest town, Escalante, Utah, were made every two weeks. It took us a good half-day each way, with a hefty climb to the top of the plateau taking about two to three hours. Escalante did not have much to offer, but we did have a motel unit rented for the summer, which provided a place for extra supplies and most welcome hot showers. Even the specialty of the restaurant, hamburgers heavily laced with horseradish, tasted good for a change. The trips to town gave us a chance to pick up mail, call the anthropology laboratory in Salt Lake City to order more supplies, such as film, and be assigned additional site numbers.

I left the Fremont Culture research for a month to do a pipeline survey in southwestern Colorado and southeastern Utah. Another time, I spent about three months doing applied anthropology, when I served as a consultant to a law firm representing mining interests that wanted to work on Hopi land. My focus was to write a summary of Hopi culture, stressing things that the mining personnel should and should not do in order to maintain good relations with the Hopi. Much of my work was in the library, but I also had to spend several weeks on the reservation to assess the current attitudes of the Hopi (Gunnerson 1960c).

During one month in the spring of 1957 and a few days in the summer of 1960, Dee and I carried out a reconnaissance on the plains of northeastern New Mexico with the firm conviction that we would there find Apache sites dating from the 1600s and early 1700s. Although we did not at first find sites that we could be certain were Apache, we got a good feel for the general archeological picture, became familiar with the topography, and established several friendships with people who would eventually be very helpful (Gunnerson 1959b). Also, this did sustain until 1964 our interest in Plains archeology and ethnohistory during our otherwise absence from the Plains.

While at the University of Utah, I noted similarities between Dismal River artifacts and ones excavated by Julian Steward (1937) from caves on Promontory Point at the north end of the Great Salt Lake (J. Gunnerson 1956). This prompted me to be especially watchful for any archeological evidence of southern Athapaskans having migrated south through the Great Basin, but we found no such additional evidence.

My work in Utah had relevance to Plains studies. The restriction of Dismal River evidence to Promontory Point was the most obvious. The bulk of my work there, which was on the Fremont Culture, provided information on the ancestors of the Shoshoni, Utes, and Comanches, who moved out of the Great Basin onto the Plains (Gunnerson 1962). More directly relevant was the conclusion that Dr. Walter Galinat of Harvard and I came to on the basis of maize from Fremont sites (Galinat and Gunnerson 1963). We suggested that the introduction of a new strain of maize entered the southwest before A.D. 900, permitting the spread (circa A.D. 900) of more productive hybridized maize not only into the Great Basin but also north onto the Plains. This new, eight-rowed maize had larger kernels and ears, was easier ground, and could be raised at both higher elevations and higher latitudes than had the previous maize in the Southwest and Plains. This could help account for the increased populations on the Plains about A.D. 900.

Dee, with her double major in anthropology and English, was able to get a part-time position in the English Department at the University of Utah, teaching freshman composition. Once it was noted that she had a feeling for linguistics and languages, she was immediately recruited to teach English as a second language to foreign students from all over the world. Soon she was awarded a fellowship so that she could continue graduate work toward a Ph.D. in anthropology with a formal minor in linguistics. By the time that we left Utah in 1960, she had completed everything except the dissertation. With a Wenner-Gren Fellowship she had done substantial research in Jicarilla Apache ethnohistory, which was to become her dissertation. One summer she spent in Santa Fe doing research in the Spanish Archives of New Mexico. They had not yet been microfilmed, so she had the experience of handling the original documents.

Harvard Again

When I left Harvard for Utah in 1954, I expected to spend about two years there. When this had grown

to five years, I knew that I needed to finish the Ph.D. and set the fall of 1960 as my return date. I hoped to complete the degree in three years and, even with a Thaw Fellowship, it took every minute of it. Not only had my experience in Utah given me a substantial research experience and a good list of publications, it provided me with excellent background for writing my dissertation. In the late 1920s and early 1930s, the Peabody Museum at Harvard had sponsored the Claflin-Emerson expeditions into eastern Utah, but much of the field work had never been published. Brew, who had participated for one year in this work, suggested that I base my dissertation on this material. Since I had spent most of my six years in Utah working in the same area as had the Claflin-Emerson expeditions, I was acquainted with roads and trails, the geography, local place names, some of the ranches, and had even visited some of the sites mentioned in the notes. Already I had some two dozen publications of my own that I cited in my dissertation and had been formulating a theoretical or interpretative framework in which to fit the older data (Gunnerson 1960a, 1962). If it had not been for my years in Utah, I probably would not have been able to "salvage" anywhere near as much of the information. Forty-year-old field notes and the lack of adequate maps in 1930 presented a challenge. Since two of the individuals who were involved financially with the earlier field work were still alive, Brew was indeed pleased to get a final report. I felt that there was a good chance that the Peabody Museum would publish the manuscript, so I spent time with its editor and wrote to the Peabody style, even to the size of illustrations (Gunnerson 1969b). Not only did Peabody publish the volume, the Museum also republished it when it went out of print.

When we returned to Massachusetts in 1960, I returned to working part time at the Children's Cancer Research Foundation, affiliated with Harvard Medical, where I had worked nearly full time during the two years before we went to Utah. The project with which I was associated in 1952-1954 was the syntheses of a human blood plasma extender. I was primarily involved in the preparation of various organic chemicals that were not available commercially. Upon returning, I worked with a cancer chemotherapy project and was mainly responsible for spectroscopic analysis. Both times I did some glass blowing: designing, fabricating, and repairing broken laboratory devices.

Dee took a very demanding but interesting job at MIT's Lincoln Laboratory as a technical writer and editor. In her position Dee selected and hired various outside free-lance typists; the one she recommended to me was superb. During these last three hectic years at Harvard, Dee curtailed much of her dissertation research but did manage to put in an occasional Saturday in Harvard's Widner Library (Gunnerson 1972), thereby never going cold on her Apache ethnohistory.

Back to the Plains

Upon completing my Ph.D. at Harvard in 1963, I went to Northern Illinois University (NIU) in DeKalb and briefly was the only anthropologist in the Sociology and Anthropology Department. I held the rank of assistant professor for one year and moved up to full professor by 1969. Dee soon was teaching part time while completing her dissertation and seeing it through publication (Gunnerson 1974). Once her Ph.D. was completed, she, too, went on a tenure-track position.

With the emphasis on science, the 1960s was a good time for me at NIU to quickly expand the library holdings in anthropology and develop the Anthropology Museum and Laboratories with me as director. Money was available for the purchase of collections and equipment and for the development of space in new buildings. By the time I left NIU after 11 years, Anthropology was a separate department with 14 faculty members, excellent laboratory facilities, and an established museum.

In 1974 I left NIU to become director of the University of Nebraska State Museum and curator of anthropology. I also held the rank of professor in both the Museum and the Anthropology Department. I resigned as director in 1982 and continued doing research and limited teaching until I became professor emeritus at the end of 1992 (Figure 11). Dee retired in 1974. We continued regular field work until 1996, and Dee continued her ethnohistorical research, utilizing our extensive microfilm and map collection, supplemented with trips to the Newberry Library in Chicago, where she had gone more frequently while at DeKalb.

As soon as we got settled at NIU in 1963, our research interests again became focused on the Plains Apaches. In 1964 we received the first of four National Science Foundation (NSF) grants to conduct reconnaissance to locate Apache sites in western Kansas, southeastern Colorado, and northeastern New Mexico. Just as the 1960s was a good period to build up the Anthropology Laboratories and Museum, it was a good time to get research grants. NSF grants supported our field, laboratory, museum, and archival research from 1964 through 1973. After

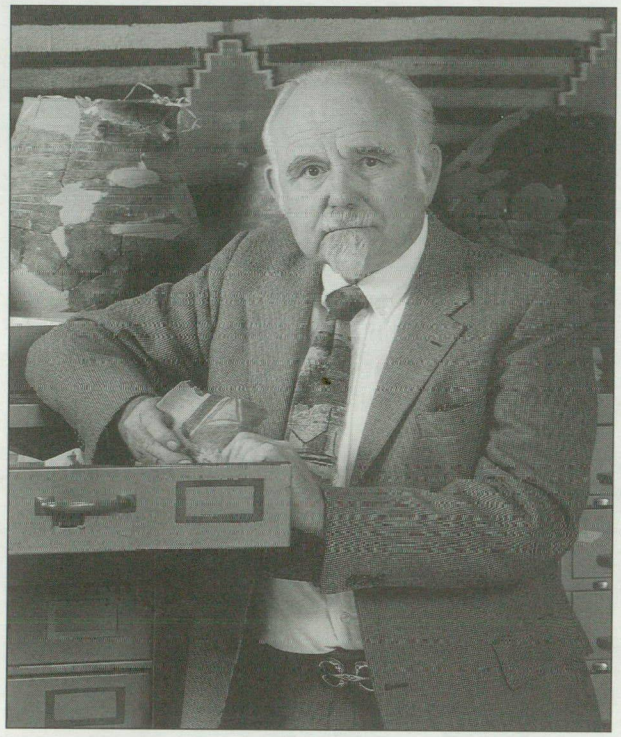


Figure 11. Jim Gunnerson, University of Nebraska State Museum, 1991.

spending six years in Utah and another three writing my dissertation, it was great to get back to the Plains. In 1965 our emphasis was on excavation in Kansas, and from 1966 on we have mainly concentrated on excavation in the plains of northeastern New Mexico with minor tangent activities.

The first site at which we excavated in 1965 was the Wells site (14BT404) just southeast of Great Bend, Kansas. Local members of the Kansas Anthropological Association had located the site and made test excavations, including the coring of a typical Dismal River baking pit. Primarily from the surface collection they recognized a mixture of Dismal River and Great Bend artifacts. We were excited over the idea of documenting through excavation the interaction of Apache and Wichita peoples. However, most of the evidence of these two occupations was very jumbled. We could follow occupation levels or use surfaces for only a few feet, and then they would suddenly end.

In late June 1965 a near record flood came down the Arkansas River and inundated much of the Wells site. Although the flood interrupted our excavation, it did furnish an explanation for the confusion we had noted in our excavations. When we knew the flood was coming, we dug until the last minute, put newspaper on the bottoms of our excavations, and backfilled. When we reopened the pits after the flood waters had gone down, the backfill had been churned up by eddy currents at the mouth of Walnut Creek where it entered the Arkansas. Apparently the site had flooded at various times during and after its occupation. As a sidelight, and in contrast, was Earl Monger's (1970, 1974) excavation at site 14PA307 in the southwest edge of Larned, Kansas, at the confluence of Pawnee Creek and the Arkansas River. It also had been flooded many times during and before its protohistoric Wichita occupation. However, there had been no eddy currents, and each flooding laid down a thin silt layer, sealing off the immediately previous occupation level (Figure 12). Would that we had such a textbook example of stratigraphy at the Wells site instead of the jumble of Great Bend and Dismal River materials.

After testing two small Dismal River sites near the Wells site, and while waiting for the flood water to go down, we excavated at a small Dismal River site (14PA304), brought to our attention by Monger, near Fort Larned. Even though it had been badly disturbed by cultivation, we were able to find evidence of a typical Dismal River house.

In mid-summer 1965 we moved farther west to the well-known site 14SC1, commonly called "El Quartelejo," in Scott County Park, 12 miles north of Scott City, Kansas. We had visited the site with its seven-room Pueblo-style structure in 1949 and again in 1964. This structure was among the earliest on the Plains to have been excavated and reported in print (Williston 1899, Williston and Martin 1900, Martin 1909). Since 1965 when we excavated there, the Kansas State Historical Society has further investigated the site (Witty 1971, 1983).

It had long been noted that, except for the seven-room pueblo structure and a few painted Pueblo sherds, the rest of the artifacts were Dismal River, and it was demonstrated that the pueblo had been built on top of a Dismal River site. Our work away from the pueblo disclosed a bison-butchering area about 70 yards southwest of the pueblo and 2 Dismal River houses (Figure 13) on opposite sides of the creek about 600 yards north of the pueblo. Also, reconnaissance and test excavations revealed that the Dismal River settlement had extended for about 2 miles along Beaver (Ladder) Creek. One of the Dismal River house sites (14SC111), brought to our attention by Bill Leadbetter, was especially interesting. From it we recovered locally made red-painted sherds, apparently in imitation of Tewa Pueblo red ware. This new type we named Leadbetter Red.



Figure 12. Earl Monger explaining a profile at the Larned site, Pawnee County, Kansas, 1964 or 1965.



Figure 13. Northern Illinois University crew excavating a Dismal River (Apache) house in Scott County State Park, Kansas, 1965.

The Pueblo-style structure was very much out of place on the Plains. It had been assumed that it was built by Pueblo people who fled to the Plains to take refuge among the Quartelejo Apaches. One such flight took place about 1662, another in 1696 (Gunnerson 1974). In 1706 Juan Ulibarri was sent out to "rescue" the latter group. He stayed in the main Quartelejo village, which he called Santo Domingo, and sent out parties to other Quartelejo Apache villages, some as far away as southern Nebraska. Ulibarri kept an excellent diary (Thomas 1935), giving distances, directions, and landmarks. By careful work we were able to reconstruct his route, day by day, which did indeed lead to the site in Scott County. He described the Pueblo people as living in huts or little houses; his failure to mention a structure such as the pueblo suggests that it was not there in 1706. We strongly suspect that the structure had been built for Spaniards by Pueblo Indian auxiliaries sometime between 1706 and 1719, perhaps as a trading post. Documents (Thomas 1935) suggest that there had been some such settlement in El Quartelejo.

West to the Foothills

The next summer, 1966, we moved our excavation activities to northeastern New Mexico, where the plains dramatically meet the Sangre de Cristo Mountains. Here also information gleaned from ethnohistorical sources by Dee provided vital clues for the locating and identifying sites as Apache (D. Gunnerson 1974; J. Gunnerson 1984, 1992). Using Ulibarri's diary of 1706 (Thomas 1935), we were able to follow his route, landmark by landmark, from Taos Pueblo, over the Sangre de Cristos, and across the plains beyond. He reached the plains where Uracca Creek emerges from the mountains and headed east across flat-but-boggy land, missing the Jicarilla villages. On his return trip, however, he kept to higher and drier land about 5 miles to the north and reported villages of Jicarilla chief El Coxo near what is now Cimarron, New Mexico. Ulibarri did not leave detailed descriptions of the villages, but he did provide information on the distribution of Apaches in northeastern New Mexico.

More details are included in the diary of Antonio Valverde (Thomas 1935), who in 1719 went out onto the plains to pursue Utes and Comanches, who had been raiding in New Mexico. Valverde, too, set out from Taos but reached the plains where the Reyado Creek emerges from the mountains. From there he worked his way north and east along the foothills, reporting and describing villages, structures, irrigation, and other horticultural activities of the Jicarilla. He also reported recent depredations of the Utes and Comanches at Jicarilla settlements. We have been able to verify archeologically many of his observations, even to the probable Apache villages that he was told had been burned the year before. Valverde never did catch up with the Utes and Comanches he was chasing, but a group of Paloma and Quartelejo Apaches from farther out on the Plains met with him in southeastern Colorado near Las Animas. These reported having been attacked by Pawnee and French.

Other documents fill out and confirm these two main sources. With Juan Domingo de Bustamante's 1723 diary (Thomas 1935), we have the last first-hand observations on the Jicarilla in the Cimarron, New Mexico, area before they were forced to withdraw to near Taos.

The documents took us into the right canyon mouths for the Jicarilla sites, but we still had to distinguish between Apache sites and the much larger and more common prehistoric Pueblo sites in the area. This involved being able to identify Apache pottery of various periods. We knew from documents of the 1840s (Abel 1915) that the Jicarilla made and traded good cooking pottery. The U.S. National and the Peabody (Harvard) museums have well-documented pieces from circa 1880, and in 1965 we found an elderly Jicarilla woman from whom we purchased heirloom pieces given to her as a child, probably pre-1920. We also solicited information from Taos and Picuris informants, who once traded for pottery from the Jicarilla and who had in the past supplied the Jicarilla potters with a special micaceous clay. The reason given by the Jicarilla for why they were no longer making pottery was that they could not get the proper clay. In 1970 we located a Jicarilla potter who agreed to let me observe her making pottery if I could provide the proper clay, which I did. She was elderly and her pottery was crude, but she still had her tools and obviously remembered her old motor habits.

Starting with these clues, plus archeological data, we were able to establish two Jicarilla Apache pottery types (Gunnerson 1969a). The more recent type, Cimarron Micaceous, began in the mid-1700s and continued well into the mid-1900s. An earlier, thinner ware, Ocate Micaceous, dates from between about 1600 and about 1750. With the transition between these types, we see the appearance of a few traits found on some Dismal River pottery, reflecting the joining of some of the Dismal River people with the Jicarilla to become the Llanero band. Shortly after the groups joined, they were forced off the plains of northeastern New Mexico and into the Rio Grande valley near Taos,

helping to date the transition. Our research, combining many lines of evidence, permitted the identification for the first time of sites in northeastern New Mexico as Apache. Our defining two pottery types and their time spans permits a simple age bracketing of sites. The recovery of trade material, both Native American and Euro-American, often permits closer dating of a site. Some sites can be dated precisely on the basis of documentary evidence.

We also asked Jicarilla informants about bell-shaped baking pits, which on the Plains are apparently unique to Dismal River sites and which we have found at Jicarilla sites in northeastern New Mexico. The informants were well aware of the pits and described how hot fires were built in them, and when the fire burned down, corn in the husk was put in them. When uncovered, the roasted corn was then dried and ground on metates. We had found small, well-made metates, unique in shape, at Dismal River sites in Kansas and at Jicarilla sites in New Mexico. The Jicarilla tribal museum in Dulce, New Mexico, had several such metates that had been given to the museum once they were no longer being used.

Some of the Jicarilla remembered that they had returned to the area around Cimarron, New Mexico, to hunt and that they had the tradition that their ancestors once occupied the area. The owner of the Chase ranch near Cimarron told of being visited by a group of Jicarilla who insisted that the Jicarilla were really the owners of the area around Cimarron. They even remembered the name of "Old Mister Chase," the founder of the ranch more than 120 ago. Old Mister Chase had been their friend.

Although in the plains of northeastern New Mexico we have located dozens of small Apache archeological sites spanning more than three centuries, a few of the more rewarding ones will serve as a sample. Unfortunately, sites of circa 1600 and before have thus far been only very tentatively identified. Site 29SM85 near Anton Chico, New Mexico, that could date from the 1500s was called to our attention by Vince Armijo, but unfortunately we were unable to get permission to excavate. The site has about 30 scattered rock rings, 10 to 15 feet across, suggesting small tipis. Dating is based on a few small red Pueblo sherds. Utility ware sherds could not be found, and the lithic artifacts were sparse and not diagnostic. We had postulated that the earliest Apache sites in New Mexico would be very much like this one.

One large tipi ring site about 25 miles northeast of Las Vegas, New Mexico, on the plains but in sight of the mountains, provided clues to the trade relationships that the Plains Apaches had with the Pueblos. Here at the Ojo Perdido site (29SM32), named for a spring clogged with vegetation, were well over 200 tipi rings (Figure 14). Associated were several hundred pottery sherds, mostly Apache (Perdido Plain) from the Texas Panhandle area, plus a few from Pecos and Picuris Pueblos dating from the mid-1600s. Local collectors had pretty well depleted the site of stone artifacts. This site was obviously a frequently reused camp site on a route from the Plains. From here Apaches could go either to Pecos or Picuris Pueblos. Ethnohistorical documents stress such trade relations (Gunnerson 1979).

The documents record the arrival of great numbers of Apaches at Pecos Pueblo, where they came to trade (Gunnerson 1974, 1988). However, very little effort had been made to find the archeological evidence of these Apache visitors until we started a painstaking search around the Pueblo. We were lucky enough to find not only the distinctive Ocate Micaceous and Perdido Plain pottery on the flat east of the latest mission church but also the remains of a simple structure that had burned, crushing an Ocate Micaceous vessel along with two local Pueblo vessels. Also on the floor was a sherd of Chinese porcelain, dating from the mid-1600s. We had found the Apache "visitor center" not far from the present National Park Service visitor center (Gunnerson and Gunnerson 1970).

Pueblo-style structures were described in the documents for the Jicarilla in the early 1700s and perhaps in the early 1600s. We found evidence of such structures at a number of sites in northeastern New Mexico. Most had been destroyed by cultivation, which is not surprising since they were near the fields that then, as now, could be cultivated with irrigation. Fortunately, at the Glasscock site (29SM20) near Ocate, New Mexico, a low mound in pasture land was called to our attention by Keith Glasscock. Upon excavation we uncovered the remains of a seven-room structure with adobe walls, represented by bases up to 2 feet high (Figure 15). The predominant pottery we named Ocate Micaceous, a very thin-wall ware with striations from having been scraped with a corncob. Associated was a stone-and-bone artifact assemblage very much like Dismal River, plus Pueblo trade pottery and majolica sherds from Puebla Mexico of the early 1700s. Also associated was a baking pit and several of the distinctive Jicarilla metates and manos (Gunnerson 1969a, 1979).

The first Jicarilla structure we excavated in northeastern New Mexico was represented on the surface by a ring of stones that obviously had been placed there. Gretchen Sammis, after whom the site (29CX68) is named and owner of the Chase ranch,



Figure 14. One of the 200-plus Apache tipi rings of the mid-1600s at the Ojo Perdido site, San Miguel County, New Mexico, 1966.



Figure 15. Northern Illinois University crew clearing rooms of a ca. 1700 Apache structure at the Glasscock site, Mora County, New Mexico, 1966.

called the ring to our attention. We thought that it might be a tipi ring, but upon excavation it proved to be a partially burned pit structure about 1.5 feet deep and 12 feet in diameter (Figure 16). We found the remains of poles and bark, which had been the roof. From the floor and fill we recovered a Plains-like stone inventory, thin Ocate Micaceous sherds and a piece of Mexican majolica of the early 1700s. This site was also in an area that probably had been cultivated and was saved from destruction by being a pit structure (Gunnerson 1969a, 1979).

About a third of a mile down Poñil Creek from the Sammis site was another Jicarilla site (29CX89) of the same age. There had apparently been an adobe structure there that had been destroyed by cultivation. However, a well-preserved baking pit had survived until it started being eroded out of the high creek bank, and in a few years was completely destroyed. It is likely that there had been similar structures, now destroyed, along several miles of the lower Poñil Canyon. Such were described in the Spanish documents of the early 1700s.

Jicarilla sites of the 1800s are characterized by the presence of the thicker Cimarron Micaceous pottery. These later Jicarilla sites were no longer on the canyon floors but were situated higher where they would command a view. One such site (29CX59) with mainly Euro-American artifacts was located about 4 miles up Poñil Canyon from its mouth. This small tipi ring site was situated up the canyon wall on a bench that was not obvious from the canyon floor (Gunnerson 1969a, 1979). This pattern of concealment probably reflected hostility between the Jicarilla and Utes, both of whom were drawing rations in Cimarron.

At the John Alden site (29SM72) on a mesa about 20 miles southwest of Las Vegas, New Mexico, we excavated what most probably had been Chief Chacon's camp of the winter of 1849-1850. Here we found, among crude structures (Figure 17) and other materials, painted sherds from a Tewa Pueblo, which were not made after 1850, and a U.S. military button of a type made only during the 1840s. In a government report (Abel 1915) is an account of a small wagon train on the Santa Fe Trail being attacked by parties of Indians in January or February 1850 from a "hill" such as the Alden site mesa. The more abundant non-Pueblo pottery is of the Cimarron Micaceous tradition. The Jicarilla were especially friendly with the Tewa, and Chacon, a Jicarilla chief, was the only leader reported to have his people anywhere near the area at that time. Various Euro-American artifacts were found at this site (Gunnerson 1979).

SIDELIGHTS

In 1985 and 1986 we made a departure from Apache studies, but not from Plains archeology. For



Figure 16. Northern Illinois University crew excavating a ca. 1700 Apache pithouse at the Sammis site, Colfax County, New Mexico, 1966.



Figure 17. Northern Illinois University excavation of an 1850 Apache structure at the John Alden site, San Miguel County, New Mexico, 1970.

years I had heard about strange sites along the Apishapa Canyon south of Fowler, Colorado, from Arnie Withers and from amateurs/collectors in the area. These sites were unusual in that the structures incorporated many very large slabs of rock, including stone "center posts." Virtually nothing was in print, but a great deal of fanciful lore had grown up about them, namely that they had been built by Vikings or other prehistoric European explorers, that the associated petroglyphs included inscriptions in Ogham, Nordic, and ancient Mediterranean languages, that a tremendous aura of psychological or mystic power was associated with them, especially at the times of solstices, etc. I had not visited the sites, because they were obviously not relevant to our Apache research, until I met a retired geologist, Joseph Cramer, who had come across them while doing geology in the area. He had taken several anthropology classes at the University of New Mexico and was sufficiently fascinated by the sites that he was willing to provide a grant to the University of Nebraska to support in part my investigation of them. After visiting the sites with Cramer in 1984, I too became interested in excavating with the hope of "demystifying" them. With student crews from the University of Nebraska, we worked at four sites, including the large, badly vandalized Cramer site (5PE484) (Figure 18). We also re-examined the nearby Snake Blakeslee site (5LA1247) (Figure 19), which in 1949 had been excavated but not reported by Hal Chase, a graduate student of Duncan Strong at Columbia. Chase's collection had been sent to the University of Denver, which kindly lent it to me for study and reporting.

Our analysis of the substantial amount of information collected led to several conclusions and suppositions. The structures were primarily dwellings, although the largest room originally may have been of a special nature. The use of so much rock merely reflected the availability of this material and the absence of adequate trees. The lithic (800+ tools plus quantities of detritus) and ceramic (5600+ sherds) artifacts indicate the Central Plains tradition with closest affiliation to Upper Republican and secondarily to Antelope Creek. It is possible that these people attempted some horticulture, but no pollen of cultigens and only the slightest evidence of corn cobs were recovered. Approximately



Figure 18. Partially excavated Cramer site, Pueblo County, Colorado, 1985.



Figure 19. Jim Gunnerson at the Snake Blakeslee site, Las Animas County, Colorado, 1985.

50,000 fragments of bone, most of it probably bison, had been completely crushed, presumably for bone morrow and grease. All bison skeletal elements were represented, along with bones from a wide variety of smaller animals, suggesting extreme dietary stress. What once may have been a ceremonial room at the Cramer site had similarities to the later protohistoric Wichita "Council Circles" of central Kansas (Wedel 1959). If originally intended for ceremonial purposes, in the end (perhaps when the people were starving out) it appears to have been used for bone grease processing. There are still unanswered questions about the Apishapa phase but no real mystery (Gunnerson 1989).

As part of the new Smithsonian Institution's *Handbook of North American Indians*, I had the opportunity to pull together my views in "Southern Athapaskan Archeology" (Gunnerson 1979) and "Plains Villagers of the Western Periphery" (Gunnerson in press).

Starting in 1980, another departure from our Apache studies was the writing of overviews of central High Plains archeology and ethnohistory for the Bureau of Land Management and U.S. Forest Service (Gunnerson 1987, Gunnerson and Gunnerson 1988). These volumes, completed in 1986, were designed to provide background information for employees who were not necessarily trained in archeology/ethnohistory but who might need to be involved in the archeology of western Nebraska, western Kansas, eastern Colorado, northeastern New Mexico, and the panhandles of Texas and Oklahoma. Included in these summaries were guides to additional, more detailed sources. Previously there had been no such synthesis for the entire area. It also gave us a chance to take a look at the broader picture, both temporally and culturally. A chance to see the forest, of which our Apache studies were some of the trees. Although these volumes were intended primarily for government employees, they came into such great demand by professionals, amateurs, and even as texts by professors that they soon went out of print.

Apache Reflections

Apparently the Dismal River people that first joined the Jicarilla in the early to mid-1700s formed the Llanero (Plains) band (Gunnerson 1974). The documents strongly suggest that other Dismal River people joined the Lipan in Texas to form its north band. Here lies an interesting problem for younger anthropologists. As yet it is not clear whether the Kiowa Apaches had a Dismal River-like culture before they joined the Kiowa in the Black Hills by circa 1700, later to move with them to the southern Plains circa 1800.

There had long been a debate as to the time of the arrival in the Southwest of the Athabaskans. Some archeologists blamed them for the fall of Classic Pueblo culture in the four corners area in the 1200s. Dee (Gunnerson 1956, 1974) demonstrated through documents that they did not arrive in the Southwest until about A.D. 1525, a view now generally accepted. As another approach to this question, I took a group of advanced field school students in 1973 to Cimarron, New Mexico, the heart of the area dominated by the Jicarilla in the late 1600s and early 1700s. Here I selected for excavation what appeared to be the most recent Pueblo site in the area to see if we could find any evidence of Apache contact. We could not and found very little evidence of Plains contact at the site. Intensive survey by us and others in the area strongly suggests at least a 300-year gap between the last Pueblo sites and the Apache occupation in the Southwest.

It is indeed fortunate for us that the detailed Spanish accounts of the early 1700s describe only Apache villages in the plains across the Sangre de Cristos from Taos. Also, we have been able to date these sites by independent means such as trade material. Even into the mid-1800s, archeology helps substantiate the documentary evidence and vice versa.

We tried, and we think successfully, to put Plains Apache archeology and ethnohistory into a broader context. Of concern has been the relationship of the southern Athabaskans to their neighbors, especially to the east and west from the time they arrived on the Plains circa A.D. 1525. We also have looked broadly at the internal dimensions of their culture history (D. Gunnerson 1974, Gunnerson and Gunnerson 1971, J. Gunnerson 1979).

On the basis of our archeological reconnaissance and excavations in plains of northeastern New Mexico and contiguous portions of surrounding states, Dee's painstaking combing of ethnohistoric sources, our study of museum collections, and working with live informants, we have at least a skeleton outline of Jicarilla culture history. The southern Athabaskans arrived from the north in the early 1500s with a simple Plains-like artifact inventory. By the early 1600s they had borrowed such Pueblo traits as horticulture, permanent dwellings, and pottery making. By 1700 their semisedentary culture flourished, and they maintained trade connections with their relatives on the Plains, the Pueblo peoples of the upper Rio Grande, and the Spanish. In the early to mid-1700s, they and their Dismal River relatives from the Plains were attacked by Utes and Comanches. Plains Quartelejo/Paloma relatives joined the Jicarilla in the

Cimarron, New Mexico, area and together were pushed on to the Rio Grande area by the mid-1700s. By the mid-1800s, they were again, or still, using the foothills of the Sangre de Cristos to at least hunt.

Acknowledgments. Among the amateurs who were especially helpful to us in our work in western Kansas, special thanks are due Bob Button, the late Orie Graves, Bill Leadbetter, the late Earl Monger, Clyde Blackburn, Charles and Pat Norton, and Helen Christy. Numerous individuals in New Mexico have been especially helpful during the 30 years that we have been returning there. Some of the more helpful include: Gretchen Sammis, Ruby Goebel, Les Davis, Bill Littrell, Bill Hickman, Bill Brewster, J. P. Mathison, Keith Glasscock, Vince Armijo, Wiley Miller, Jose Torres, Paul Clawson, Lee Gorley, John Alden, "Deacon" Weaver, Walt Linsen, Willard Loudon, Ena Srout, Loretta Martin, Steve Zimmer, and the staff of Pecos National Historic Park. Our work in Colorado on the Apishapa could not have been done without the generous support of Joseph Cramer. Also gratefully acknowledged are the grants from the National Science Foundation, which supported much of our research between 1963 and 1974.

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NOTES

Surface Survey in the Clinton Lake Area

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The Kansas Anthropologist 19:63–91

This paper describes an amateur surface survey of prehistoric sites in the Clinton Lake area. The investigations were carried out over a five-year period from 1991 to 1996. Although the work was done by amateurs, close contact was maintained with the Archeology Office of the Kansas State Historical Society and the U.S. Army Corps of Engineers local office. A total of 27 sites were relocated, and 7 new sites were recorded. The findings of this study indicate extensive cultural occupations in the Early and Middle Ceramic periods. There is some evidence of occupations in the Archaic period.

Introduction

The idea for this survey came out of a conversation in 1992 between Randall M. Thies, archeologist at the Kansas State Historical Society (KSHS), and Daryl Walters, a member of the Kansas Anthropological Association (KAA) who recently had completed a shoreline survey in the Perry Lake region (Walters 1995). While discussing the Grasshopper Falls phase occupations in the Delaware River valley on the north side of the Kansas River, the question arose, "Why does this phase not seem to extend south of the river into the Wakarusa valley?" Thies mentioned that it would be good to know more about the subject and that a reassessment of known sites and search for additional sites in the Clinton Lake area would be a worthwhile project.

To implement this idea Walters first talked with the U.S. Army Corps of Engineers (USACE) at the Clinton Lake office and told them what he wanted to do, and they agreed to the project. The KSHS Archeology Office also gave its approval. Walters agreed to keep systematic records, to retain diagnostic artifacts, but only record other artifacts, and to note information on rock debris, debitage, site conditions, etc. The approach decided upon was pedestrian survey; no digging, scraping, or shovel testing was to be undertaken. A narrative was to be written for each survey trip and a map marked to show the areas covered. Artifact forms were to be filled out for each trip, unless nothing was found, and outline drawings of artifacts were to be made in the field when conditions were favorable. Projectile points and fragments thought to be of diagnostic value and all pottery sherds were to be retained for study. Even small sherds were considered to be of value when analyzed for thickness, temper, color, etc.

The procedural plan was as follows: First, do the survey and record keeping for several trips. Second, show the artifacts retained and copies of the progress reports to the USACE at their Clinton Lake office. Third, take the artifacts and progress reports to the KSHS for cataloguing and storage.

The survey was planned for four years of seasonal work. During the summer with crops planted in the fields and heavy vegetation elsewhere, little could be accomplished. The survey actually extended over nearly five years because two new and important sites were discovered near the end of the planned four-year period.

Late in the autumn of 1993, John Peterson joined the project with the consent of the KSHS Archeology Office and the USACE. Peterson is also a KAA member, and he has experience in writing with the KSHS and other historical research projects. Since much of the archeological work in the Clinton Lake area has been supervised by University of Kansas (KU) archeologists and many of the artifacts from those sites are on file there, in 1994 it was decided that a KU connection would be of mutual benefit. Dr. Brad Logan, senior curator at the KU Museum of Anthropology, agreed, and the investigators began sending copies of the reports to his office.

For about a year the project moved slowly due to weather and other problems, but then the pace began to improve, and in the last year things really came together. The authors believe that the project has produced a considerable amount of corroborating evidence and possibly some new evidence about the prehistoric cultures that inhabited the Clinton Lake area.

History

Douglas County has a very rich history, beginning possibly 8000 to 10,000 B.C., when hunter-gatherer

groups followed herds of large animals (some of which have long been extinct) into this area. Artifacts from this period, known as the Paleoindian period, are occasionally found in northeast Kansas. The base section of a Paleoindian projectile point is on display at the Clinton Lake Office museum. It was found on an early survey of the lake area on a site visited by this survey.

Some evidence of occupation by later hunter-gatherer groups during the Archaic period has been found in northeast Kansas, mostly from the later part of that period. Although much of the evidence is believed to have been deeply buried by erosion, scattered Archaic sites have been found in the Flint Hills and in the Kansas City area. Late Archaic material has surfaced in Douglas County, but no occupational sites have been discovered.

Moving later in time, there is much evidence that this area was inhabited during the Early Ceramic period (A.D. 1-1000). This was the period when pottery began to be used extensively in this area, and the bow and arrow were beginning to replace earlier hunting equipment. Still later, during the Middle Ceramic period (A.D. 1000-1500), the inhabitants left evidence of a more varied use of pottery, with sizes and shapes changing and some decorations being added. Also the extensive use of the bow and arrows tipped with small triangular projectile points becomes evident. Agriculture, which began in the Early Ceramic period, became more important in this period with the use of corn, beans, squash, and pumpkin.

After about A.D. 1300 the number of habitation sites seems to decline rather sharply in northeast Kansas for reasons that are not fully comprehended. The Late Ceramic period is considered to begin about A.D. 1500, when European people began to settle in what now is the United States. The Wakarusa River valley was inhabited by the Kansa tribe when the Europeans first entered Kansas. Although the Spanish may have explored northeast Kansas first, the French first controlled the area, but they gave up their dominion when they sold it to the United States in the Louisiana Purchase of 1803.

In 1825 the Wakarusa River valley became part of a reservation for the Shawnee tribe, which was moved from the upper Ohio River region where it had been a strong and important tribe. By the early 1800s the Shawnee had been decimated by wars and disease until only a small number existed. The main group settled near Kansas City. If any ever lived in the vicinity of Clinton Lake, they left very little evidence. In 1867, a little more than 40 years later, they were moved to a reservation in Oklahoma.

Lawrence is the largest city near Clinton Lake. It was founded in 1854 by free-state settlers and became their headquarters in the free-state versus pro-slavery conflict that followed. In 1863 most of the downtown section was burned, and more than 150 men were killed by Quantrill's raiders. In the late 1850s some of the conflicts between the two sides took place on land now inside or bordering the Clinton Lake project. Kanwaka is a small settlement about a mile north of the lake on the route of the Oregon Trail. Stull was another early settlement that never grew much but still exists. Bloomington was founded on the present site of the small town of Clinton. In 1857 Bloomington moved 3/4 mile to the north. Some of its population refused to move and formed the town of Clinton. Bloomington was officially abandoned in 1876, but Clinton remains as the only town actually on the lake. In the 1960s the building of Clinton Lake greatly reduced the farmland around Clinton and covered many prehistoric sites with water.

Local Geographical Information

The Wakarusa River drainage extends through several Kansas counties, beginning in Wabaunsee and crossing Shawnee into Douglas, where it joins the Kansas River about 7 miles east of Lawrence. Some drainage also comes in from five small creeks in Osage County.

Clinton Lake was developed primarily for flood control with the secondary purposes of supplying water and providing recreational opportunities for nearby cities and rural areas. The Wakarusa River valley forms the main arm of the lake, and two other valleys form smaller arms, Deer Creek to the northwest and Rock Creek to the southwest (Figure 1). It is on those two arms that the four survey areas are located (Figure 2). The larger Wakarusa arm was not chosen for survey because much of it is inundated and some areas are difficult to access. Although there are some recorded sites, certain archeologists believe that many sites that once existed are deeply buried now.

Both Deer Creek and Rock Creek have water backed up in their channels at the normal multipurpose level, but part of the valley land remains for agricultural use as it was before the lake was impounded. At flood level much of this land is inundated.

The Woodridge Primitive Area is mostly a large grass-covered wilderness on a high plateau surrounded on three sides by valleys, the Wakarusa River to the southeast, Deer Creek to the northeast, and Dry Creek

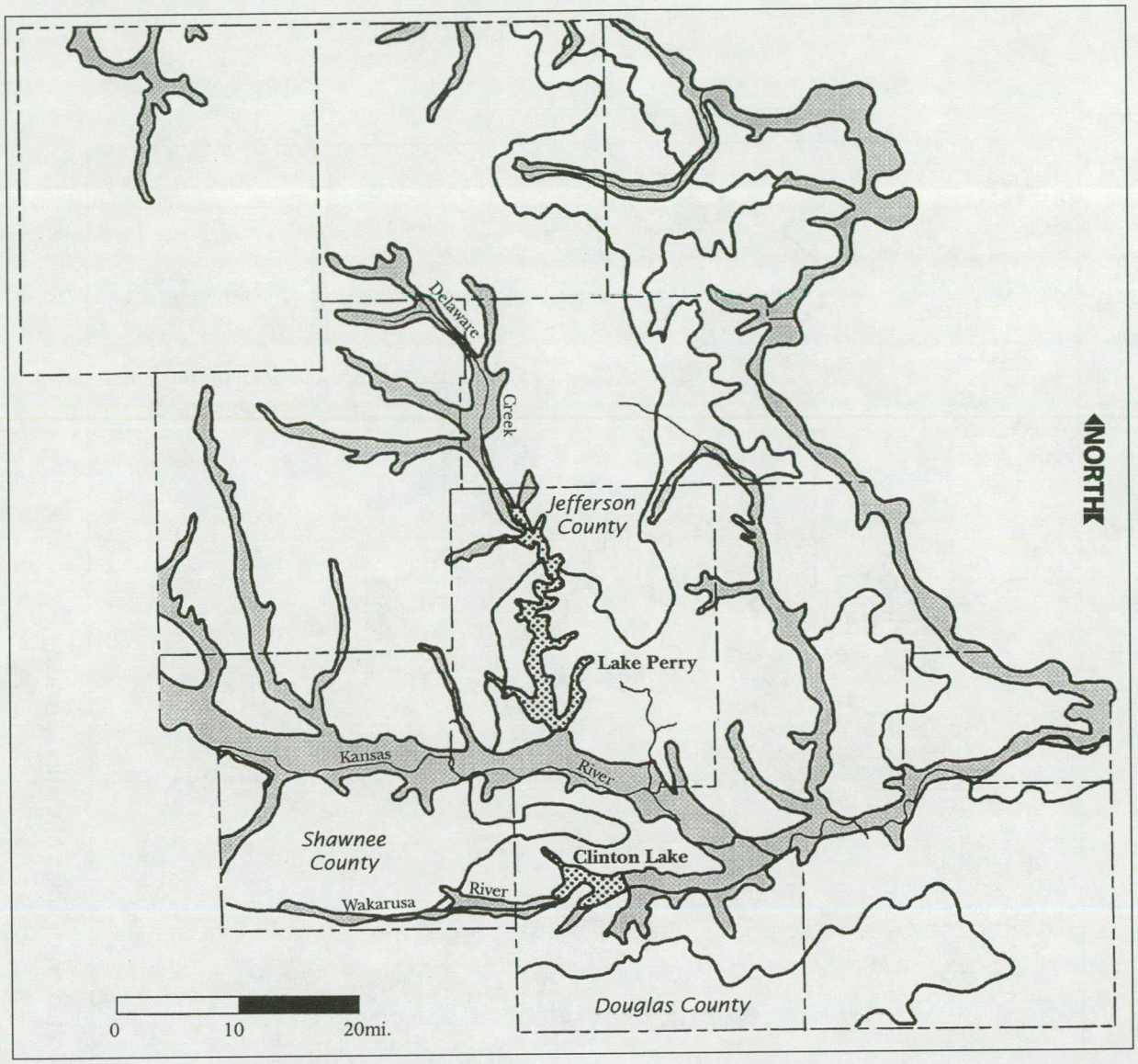


Figure 1. This map of northeast Kansas depicts Clinton Lake, Perry Lake, and the region's major streams.

to the northwest. The plateau is mostly above maximum flood level. Several known upland sites are recorded on the plateau, but heavy ground cover made finding them difficult.

Rockhaven is on the hilly ridge adjacent to the inundated channel of Rock Creek. The investigators are aware of only shoreline sites, and only one, 14DO406, was included in the survey. It was considered an important one as artifacts found there represent three separate components, with the oldest dating into the Late Archaic period.

The survey at Deer Creek included 18 sites on both the right and left banks. The Rock Creek area was divided into two parts. In Rock Creek north there were six sites, and in Rock Creek south there were four sites. At Rockhaven one site was visited, and at Woodridge five sites were inspected.

Evaluating Site Components

In evaluating the prehistoric material and sites encountered during the survey, the authors were greatly aided by reviewing the reports of previous surveys and excavations in the Clinton Lake area. Reports of archeological work in other parts of eastern Kansas, particularly those from the Perry Lake area, also have been of

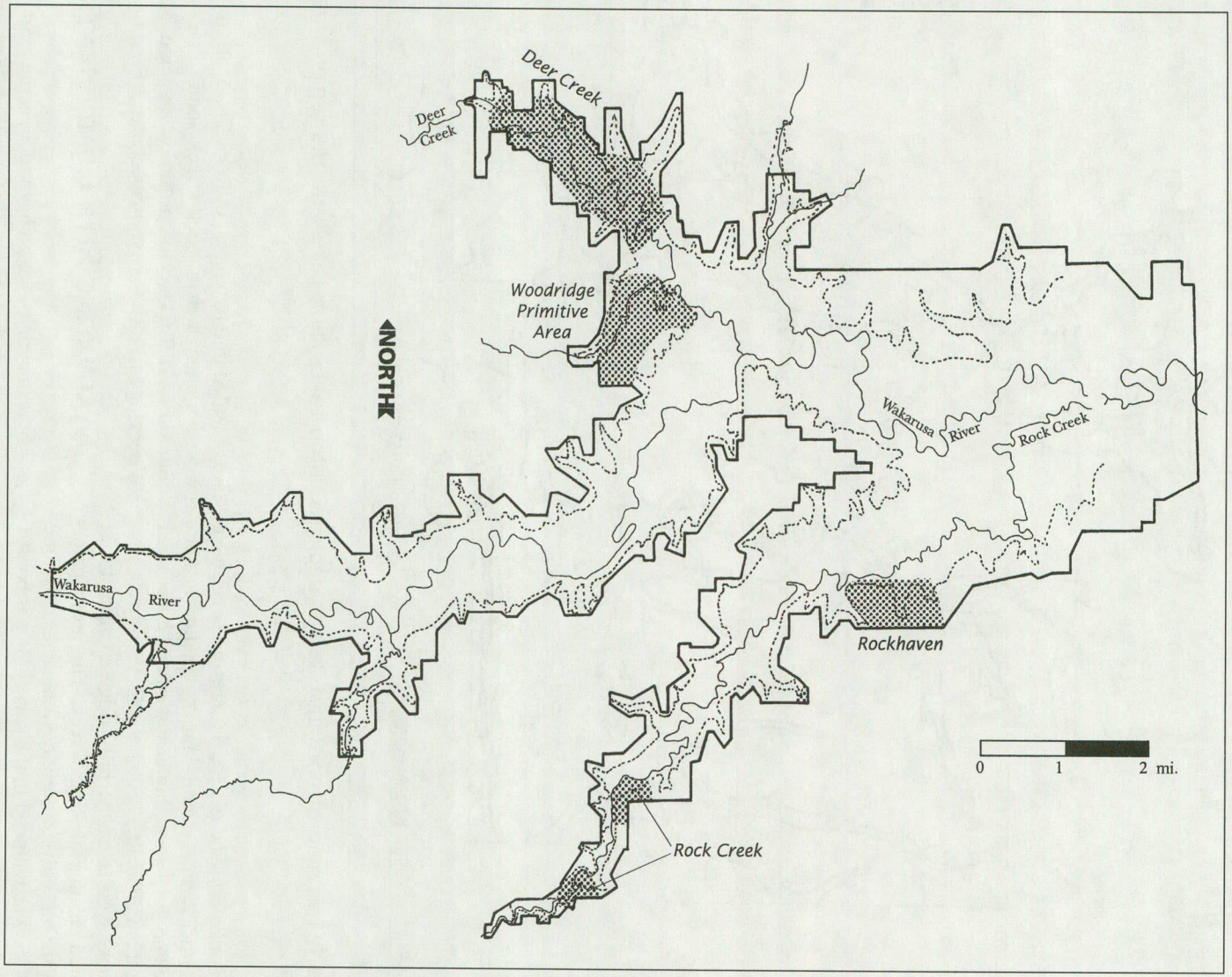


Figure 2. Surveyed areas are indicated on this map of Clinton Reservoir.

benefit and were relied on heavily in identifying time periods. Archeologists have learned much about the peoples who preceded us and, although many details are in doubt and evaluations change as more work is done, this accumulated background of information is essential in any attempt to identify, understand, and arrange the material. Illustrated projectile point charts with general dating information were used to some extent. Convenient access to the KSHS Archeology Office was of great value, especially in the early part of the project. The KU connection also was helpful.

In comparing the surface finds with this background information and trying to fit them into known time periods and cultures, the investigators had to rely mostly on projectile points, other bifaces, and potsherds. These stone and ceramic materials are durable enough to survive in the archeological record, and they are subject to stylistic variations that permit assigning them to a specific time period or cultural group.

One of the shortcomings of a pedestrian survey is that all of the artifacts are mixed together on one level. In heavily used areas, such as Deer Creek and Rock Creek, some of the better sites may have been inhabited many times and during more than one period, making it very difficult to identify cultural components accurately. Where a site had an obvious primary component with both pottery and projectile points matching a time period, it was assigned to that period. If the evidence seemed firm enough, the investigators went one step farther and indicated whether it was thought to be early or late in that period. If the evidence was conflicting or insufficient, the site was classified as multicomponent, unknown, or unidentifiable.

ARTIFACTS

POTTERY

In this survey 245 potsherds were recorded, including 212 body sherds, 18 rim sherds, 13 near-rim (neck) sherds, and 2 bottom points of jars. Only on 14DO415 and 14DO59 were there sherds in moderate amounts. Elsewhere they were scarce or very scarce.

Pottery sherds were not analyzed by professional archeologists, but every sherd was cleaned and examined under bright light with magnification. The potsherds also were measured and checked for thickness, temper, and shape. The size and shape of the original vessel were estimated if available sherds made that possible. The colors of the inside surface, outside surface, and core of each sherd were recorded. Decoration by marking and shaping, surface finish, presence of cordmarking, and hardness were observed and recorded.

The terms used to describe tempering materials in this report are as follows: (1) All types of stone that were crushed and used as temper are referred to as "grit." No attempt was made to analyze the types of stone when more than one type was present. (2) Some sherds appeared to contain both grit and fine sand; others contained crushed, coarse sand and fine sand. These differences and other combinations of these materials have been recorded. (3) Crushed sherds, fired clay, and fired daub or any combination of the three is usually referred to as "grog."

More than 200 potsherds were analyzed in which a primary temper material could be identified with the following results: 4.7 percent little or no temper, 26.7 percent sand, crushed sand, or both, 30.5 percent grit, and 38.1 percent grog. As the determination of these percentages was based on judgment, they are tentative and subject to further analysis.

Significant amounts of fine grass or fiber were found in several potsherds found on 14DO415. There is too much of this material present to be accidental. The investigators expected to find a moderate amount of shell used as temper, especially on the Middle Ceramic sites, but little was found in the collection. In some accounts red ochre was mentioned as temper. While a lot of red substance was observed, it was interpreted as fired clay or daub. Red-orange clay is plentiful in this area, and some of the reddish material in the sherds may be incidental rather than intentionally added.

Evidence of decorated jars was found on 14DO39, where several sherds were shaped or marked in a decorative way. Site 14DO34 had two similarly decorated sherds, even though only a few pottery fragments were found on that site. These decorated sherds appear to be similar to those found on the Keen-Kroll sites north of Valley Falls by Witty (1983) and on sites at Pomona Lake by Wilmeth (1970).

Another type of decorating was found on heavy grit-tempered pottery on 14DO415. Knobbing was found on one thick rim sherd, and wide scallops were found on two rims that were not from the same jar since the patterns were different. Several large dart points were found on this site but no small arrow points. The possibility of a second component with Middle Ceramic pottery on this site complicates its interpretation. Additional investigation would be necessary to determine a primary cultural affiliation.

The survey collection includes both thick sherds with primarily heavy grit temper, which were mostly from large vessels, and thinner sherds with sand, clay,

and/or grog temper, which appear to have come from smaller jars of more varied sizes and shapes. Reports by professional archeologists indicate that the first type generally was earlier (Early Ceramic) than the second (Middle Ceramic). On some sites only one or the other variety was present. Where both were found, it was tentatively assumed that more than one time component was present. However, small sample size made it difficult to be sure.

Projectile Points

In this survey 78 bifaces, both completed and fragmented, were found and recorded that were judged to be finished stone tools, including 43 large, 15 medium, 17 small, and 3 long drill or perforator shafts. For projectile points and other bifaces, the various possible uses and how they were manufactured were carefully considered. Size, shape, type, numbers, kinds of material, and ratios all were recorded. The ratios or complete absence of small, medium, or large projectile points was considered of diagnostic value.

Most of the medium and small bifaces probably were used as projectile points. The large ones may have served as projectile points, spear points, knives, or other tools. Since even trained archeologists have difficulty in determining what purpose a large, stemmed biface served, these amateur investigators did not speculate but followed the common practice of calling them projectile points. In addition to those mentioned above, 40 bifaces were recorded that were judged to be preforms in various stages of production, a majority of which are large in size. This makes a total of 118 bifacial stone tools recorded in this survey, an assemblage which is diverse in both sizes and styles.

Site 14DO406 is a multicomponent site on which several types of large, stemmed dart points were found, but one style appears to dominate. Although there are individual variations, the typical point is large, thick, and slightly bitrangular with no barbs and a thinned and slightly concave expanding stem. When held stem up, the point resembles the outline of a great horned owl. In addition to several finished points and fragments, there are preforms in most stages of production. Three preforms show that the base thinning and slightly concave stem were built in at an early stage of production.

The investigators examined surface artifacts from several sites in this survey that are on file at the University of Kansas laboratory. In this group are artifacts from 14DO58, found by Chism in the 1960s. One of three bifaces is a perfect specimen of the "owl" type found on 14D0406. It matches exactly a composite drawing, made earlier from projectile points and fragments with slight variations, to illustrate that style of point.

A relatively large number of large and a few medium-size bifaces were found on 14DO415 and 14DO416. Neither site had any evidence of small arrow points. The bifaces from both sites are tentatively considered to reflect a cultural component from the Early Ceramic period, possibly similar to the Wakarusa phase, which was identified at 14DO27 in the 1960s.

Several sites had large, medium, and small corner-notched dart points. These sites had mostly thick grit-tempered sherds with no decorating of rims and are thought to be from the middle part or near the end of the Early Ceramic period. They compare well with the ceramics of the Deer Creek phase in this vicinity.

Several other sites had primary components dating to the Middle Ceramic period. These sites had a few large and medium-size bifaces but were dominated by small triangular arrow points that include several types of corner-notched, as well as unnotched, specimens. Sand- and grog-tempered sherds and some sherds that are thinner and have little or no temper helped to identify the time period. There appears to be very little decorating of pottery. These artifact assemblages resemble those from sites identified with the former Clinton phase, now designated as the Maybrook phase of the Pomona variant.

A projectile point section found on 14DO410 could be the oldest artifact found on this survey. It is the proximal end of a square-stemmed point that looks much like a Scottsbluff style (Figure 3). As the blade is missing, a positive identification cannot be made. The square stem is basally thinned and slightly concave, and the edges are ground. The specimen is finely chipped and has a good flute on one side.

Another type of biface should be mentioned, as several were found. The style cannot be considered rare since similar projectile points are illustrated on some identification charts. However, the literature review did not yield any mention of their having been found in this area. Although most were broken (at about the same angle), one complete point was found on 14DO35. It is thin, sharply excurvate with side notches near the base, leaving a relatively wide and short stem. These bifaces are small to medium-size with the stem almost too wide for an arrow point. They are ordinarily quite sharp, but their purpose is uncertain. Most are made of local chert, but one is jasper. They usually were found on sites with Middle Ceramic components.

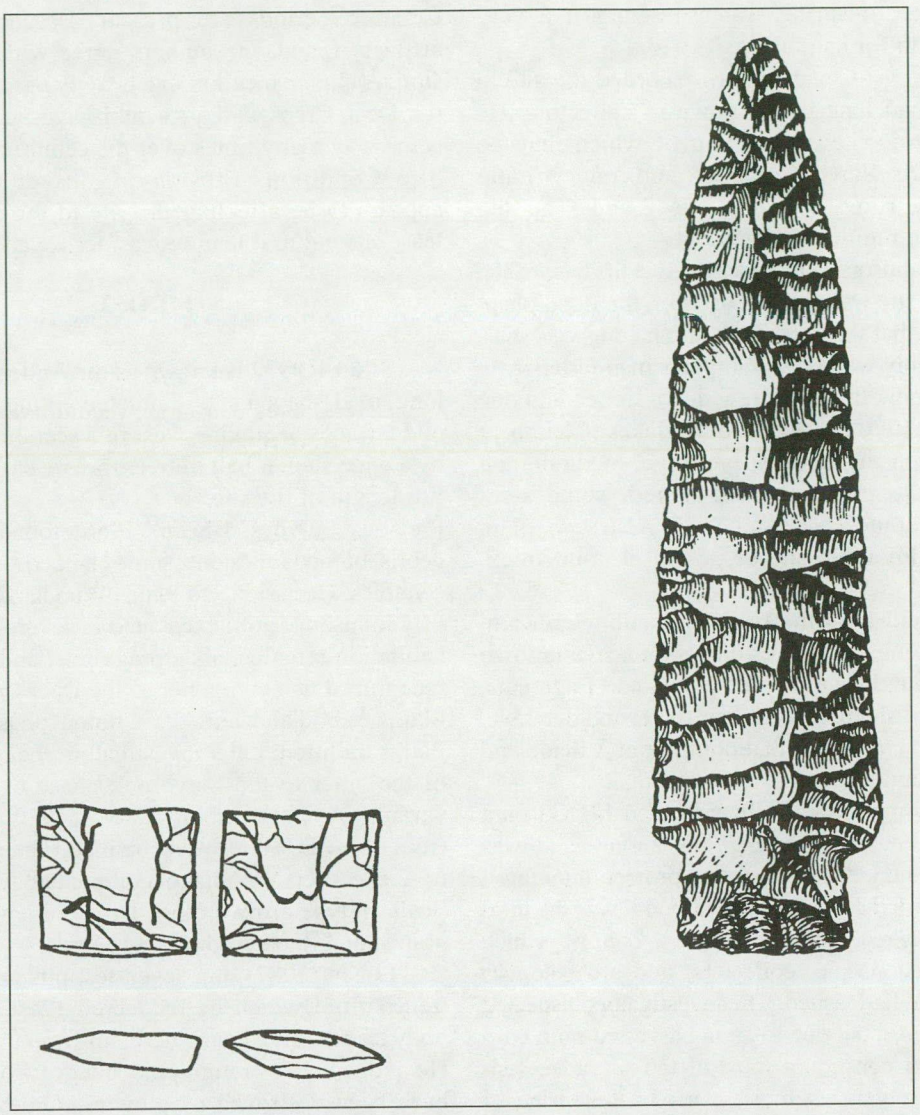


Figure 3. The front and back of a base of a possible Paleoindian point, which was found in the Deer Creek survey area, is compared to a drawing of a complete Scottsbluff projectile point. Artifacts are illustrated at actual size.

Most of the Middle Ceramic projectile point types found on this survey were illustrated in the Pomona reports by Wilmeth (1970) and Witty (1983), references that the authors used. However, they reported two types that were not observed on this survey, namely three- and four-notched arrow points with rounded, possibly ground corners. On some of their sites, these types were common or even dominant. On 14DO39, the only site that yielded decorated pottery resembling that found by Witty and Wilmeth, no diagnostic projectile points were discovered.

Site Descriptions

Deer Creek Sites

14DO3

Site 14DO3 extends from the flood plain through most of the second terrace in a long east-west oval on the right bank of Deer Creek. The entire recorded site probably covers 7 to 8 acres. Small unnamed streams are in confluence with Deer Creek just a few meters to the north of the site and just south of the site. During the time of prehistoric occupation, it is likely that one or both of these streams

were a source of spring water, making it a very choice location for habitation.

Previous Surveys. Chism (1966) recorded the site in 1965, but it had long been known to collectors. He found five projectile points, two of which may be Archaic, three Early Ceramic, and one Middle Ceramic. One rim sherd also was found. The site appeared to be multicomponent.

In 1966 Johnson (1968) excavated at the base of the terrace, as the site was thought to be on the flood plain. He concluded that the part of the site he dug was shallow and probably was a Central Plains manifestation.

The Iroquois Institute crew dug a trench and one test square in 1976 and found only flakes (Chambers et al. 1977). On the surface five large, medium, and small projectile points were gathered, some side-notched and some corner-notched. Also two plain and six cordmarked sherds, 5 to 9 mm thick, were collected.

In 1978 and 1979 the Iroquois Institute crews in surface collecting, shovel testing, and excavating two test squares found six projectile points and fragments, a grit-tempered sherd, an obsidian flake, and debitage. Nathan (1980) concluded that both Plains Village and Plains Woodland elements were present.

Walters/Peterson Survey. Walters located 14DO3 on a scouting trip before beginning this survey and was encouraged to undertake the survey project, thinking it was an unrecorded site. Later he learned it was the third prehistoric site recorded in Douglas County, which many interested people, collectors, and archeologists knew about and had visited. The investigators inspected the site five times, but due to an unharvested milo crop in the field that constitutes most of the site area, visibility was a problem on most visits. In the spring of 1994, fire-reddened limestone, which appeared to be a possible hearth, was observed in a small ditch at the north edge of the field. This was in the area of the heaviest concentration of artifacts, which was only about 20 m (65.6 ft) in diameter. Heavy rains in the spring of 1995 apparently eroded away or covered the limestone, as it could not be relocated in the fall.

Artifacts. Three projectile points, including a medium-size corner-notched, expanding-base point and a large corner- and base-notched point (Figure 4f and h), several biface fragments, a drill tip, two scrapers, several utilized flakes, and three sherds were found. One sherd is lightly cordmarked, 8 mm thick, and grit tempered; one is smooth, 6.5 mm thick, and sand tempered; and one is cordmarked, 4 mm thick, and not tempered.

Comments. It is the opinion of several archeologists who have surveyed and tested 14DO3 over a 30-year period that components of both Early and Middle Ceramic periods are present. Based on the few artifacts found, the authors agree with this conclusion. A choice location in a heavily used area, such as the Deer Creek valley, would have been utilized in some way many times over the centuries.

Site Condition. Erosion in this cultivated field appears to be affecting the site to the extent that at least one cultural feature was destroyed or obscured.

14DO32

Site 14DO32 is known as the Anderson site. This long, oval-shaped site is situated on the first and second terraces beginning west of a section line, marked by a wide shelter belt of trees, brush, etc. that runs the full length of the site.

Previous Surveys. Chism (1966) found much chert debris, burned limestone, some chipped stone tools, and ceramics. He assigned a Plains Woodland affiliation.

Johnson (1968) excavated in several areas, found habitation remains, six storage pits, and a burial. He recognized two components: the Deer Creek phase of Plains Woodland and the Clinton phase of Central Plains tradition. Later investigators changed the name of the latter to the Maybrook phase of the Pomona variant. A radiocarbon date of 950 ± 150 B.P. (roughly A.D. 1000) was obtained. The identification of the earlier Woodland component was based on Scallorn type arrow points, large corner-notched dart points, and thick cordmarked sherds.

Logan (1987) dug seven test pits and a backhoe trench from which he recovered 12 stone tools, 32 body sherds, and 1 rim sherd, all from the plow zone. He judged the stratigraphic integrity of the site to have been destroyed by plowing. On the surface he found five projectile points or fragments, which he considered to be either Plains Woodland or Maybrook phase Pomona.

Walters/Peterson Survey. The investigators identified the site in December 1992 without difficulty and made 11 more visits. Part of the reason for the large number of visits was that the site was close to and frequently on route to a number of other sites. Since it was under cultivation, visits were limited to early spring or late fall, after the soybeans were harvested. A scattering of artifacts were found over about 3 acres with the heaviest concentration in the east part along the tree line at the edge of the field.

Artifacts. Six bifaces, complete or fragmented, were retained; four were large or medium-large, and two were small (Figure 4g, j, k, m). Other biface sections, including blade sections and preforms, were left on the site, as were two scrapers and several utilized

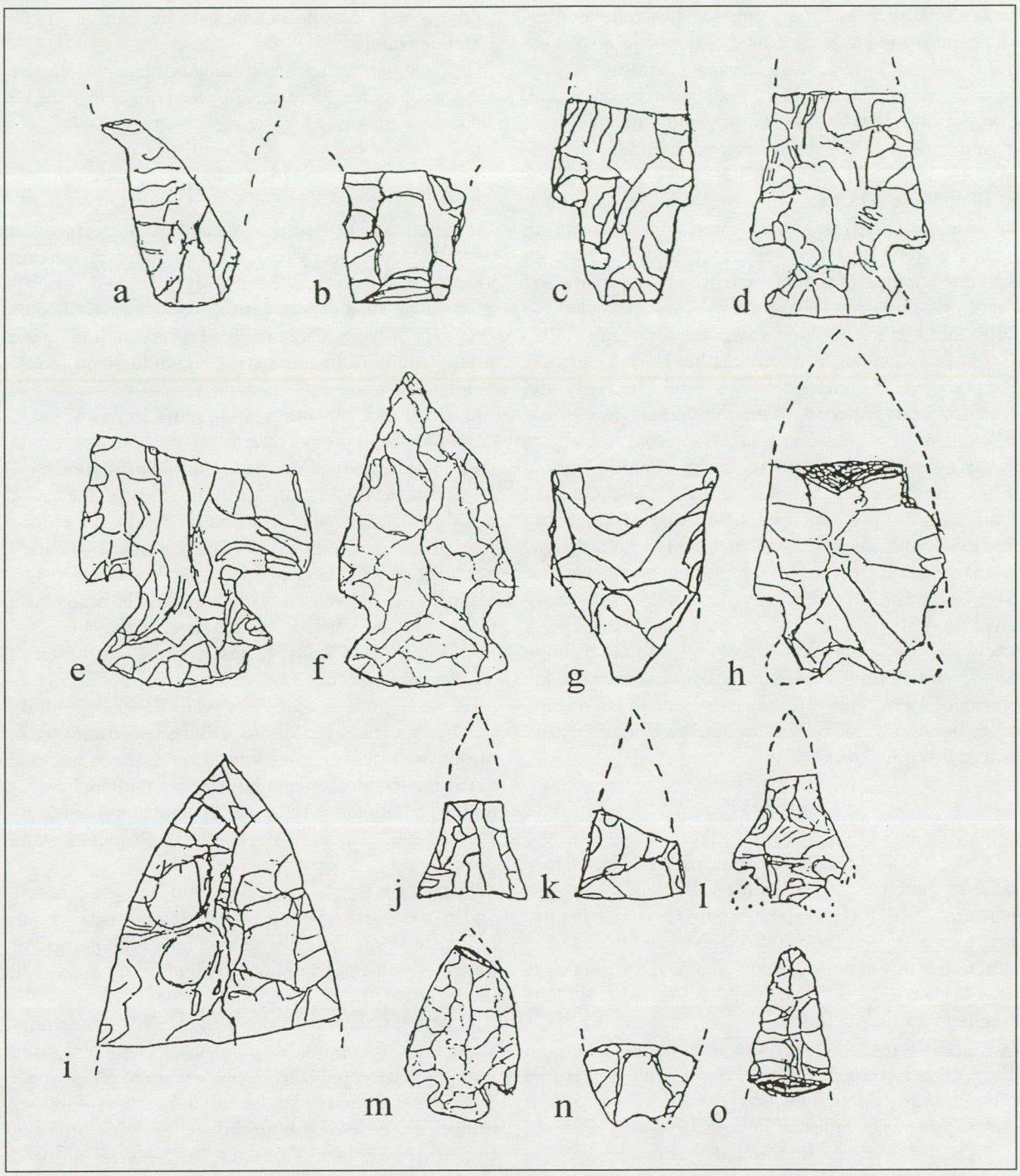


Figure 4. Both contracting stems and expanding stems are illustrated. A and b are from 14DO413; c, from nearby 14DO56; d, from 14DO19; e, from 14DO60; and f, from 14DO3. G, a square stem, resharpened until little is left, is from 14DO32. H, a large, badly fragmented biface but with a still identifiable shape, is from 14DO3. I, is a large, well-crafted, very sharp biface, probably a cutting tool, from 14DO16. J and k are Fresno type arrow points from 14DO32. L, badly fragmented but identifiable as similar to a Reed type, is from 14DO15. M is an excurvate biface, found on 14DO32. N is a finely chipped biface base that has sort of a flute on both sides and was found on 14DO413. O, probably a drill or perforator, is from 14DO19. Drawings are actual size.

flakes. Complete and fragmented manos and hammerstones and moderate amounts of debitage also were present. Very little heat-treated material was noted.

Three rim sherds and 22 body sherds were found. Two of the rims were smooth, and one had faint oblique marks. The body sherds included 2 cord-marked, 19 smooth, and 1 too worn to tell. Six were 8 to 10 mm thick, 15 were 5 to 7 mm thick, and 1 (a neck or shoulder sherd) was 4 to 9 mm thick. Tempering agents were sand (10 specimens), sand and grog (6 specimens), grog (4 specimens), grit (1 specimen), and sand, grit, and grog (1 specimen). Tan dominated the color, but there was some brown and dark gray.

Comments. The artifacts provide evidence to support the presence of components from both the Early and Middle Ceramic periods. The investigators are unable to explain why the stone bifaces appear to be dominated by material from the Early Ceramic period, while the pottery is dominated by Middle Ceramic material. Possibly that results from the survey being strictly a surface search, while earlier investigators found a more representative sample in their excavations.

Site Condition. Much of the site is subject to active erosion. The field is not terraced, and the slope is fairly steep in some parts. Sherds were found through 1995, but few lithic artifacts were discovered after the spring of 1994. This difference may result from some areas being covered by washed soil or from increased activity of collectors.

14DO34

Site 14DO34 is on the right bank of Deer Creek close to the creek channel and on the flood plain. It is northeast of 14DO3 and about 500 m^2 (1,640 ft^2) in area.

Previous Survey. Chism (1966) recorded the site but said that it might be an extension of 14DO3, which is on a higher terrace to the south. He found one blade fragment and some flakes.

Walters/Peterson Survey. The site was inundated in 1993. When relocated in 1994, it was a low red mound, easily spotted because the soil around it was dark. High water returned in both 1994 and 1995.

On the first visit the mound was covered with a moderate scattering of debitage and other rock debris. Two decorated sherds, one a rim and the other a near-rim, were collected. On the next trip in February 1995, high water had covered the low mound, and it could not be positively identified. In September 1995, after even heavier flooding, the site remained unidentifiable.

Artifacts. Very little diagnostic evidence was found. The two sherds had clay and sand temper and possible evidence of decorating.

Comments. The artifacts appear to be from a Middle Ceramic culture.

Site Condition. After being initially quite visible, the site was obscured alternately by weeds and grass and by silt deposited during high water.

14DO35

Site 14DO35 is on the first and second terraces on the left bank of Deer Creek, where an unnamed stream joins from the north. It covers several acres, possibly as much as 10, and sometimes is called the Stull site.

Previous Surveys. Chism (1966) recorded the site and found much lithic material, including projectile points and fragments. Earlier a local collector had found a contracting-stem point, other large and small corner-notched points, alternately beveled knives but no pottery. Chism suggested multiple affiliations.

Johnson (1968) dug on both sides of the creek but was not allowed on the east field, where the main part of the site is now. He found a possible buried hearth, two projectile points, eight blade fragments, scrapers, and seven small potsherds. He assigned a Central Plains affiliation to that part of the site.

Logan (1987) dug 12 test pits east of the creek and found flakes down to 40 cm and pottery down to 20 cm. He noticed that there were fewer of both on the lower terrace. He found one large expanding-stem biface, two medium-size unnotched bifaces, and one side-notched projectile point. He also found 35 sherds and 30 additional stone tools that are not diagnostic. He assigned Plains Village, Plains Woodland, and possibly an Archaic affiliation.

Walters/Peterson Survey. This site has good access and is easy to find. The first of seven visits was in February 1993. Visibility generally was 50 percent or better. A moderate amount of debitage and other rock debris covered a relatively large area.

Artifacts. Finds included a fragmented contracting-stem projectile point, a small corner-notched point with wide base and convex blade (Figure 5h), a small point made from a flake, the middle section of a large biface, the base of a large biface, a biface preform, two drill sections, five scrapers, several utilized flakes, and four potsherds. All of the sherds have grit temper, two also may have some grog, and their thicknesses vary from 6 to 8.5 mm. One rim sherd was cordmarked with a thin cord.

Comments. Site 14DO35 is in a choice area overlooking Deer Creek and another stream. In addition there was a likely source of chert in the banks of nearby streams. Although few sherds were found, lithic debitage is abundant, which suggests that stone

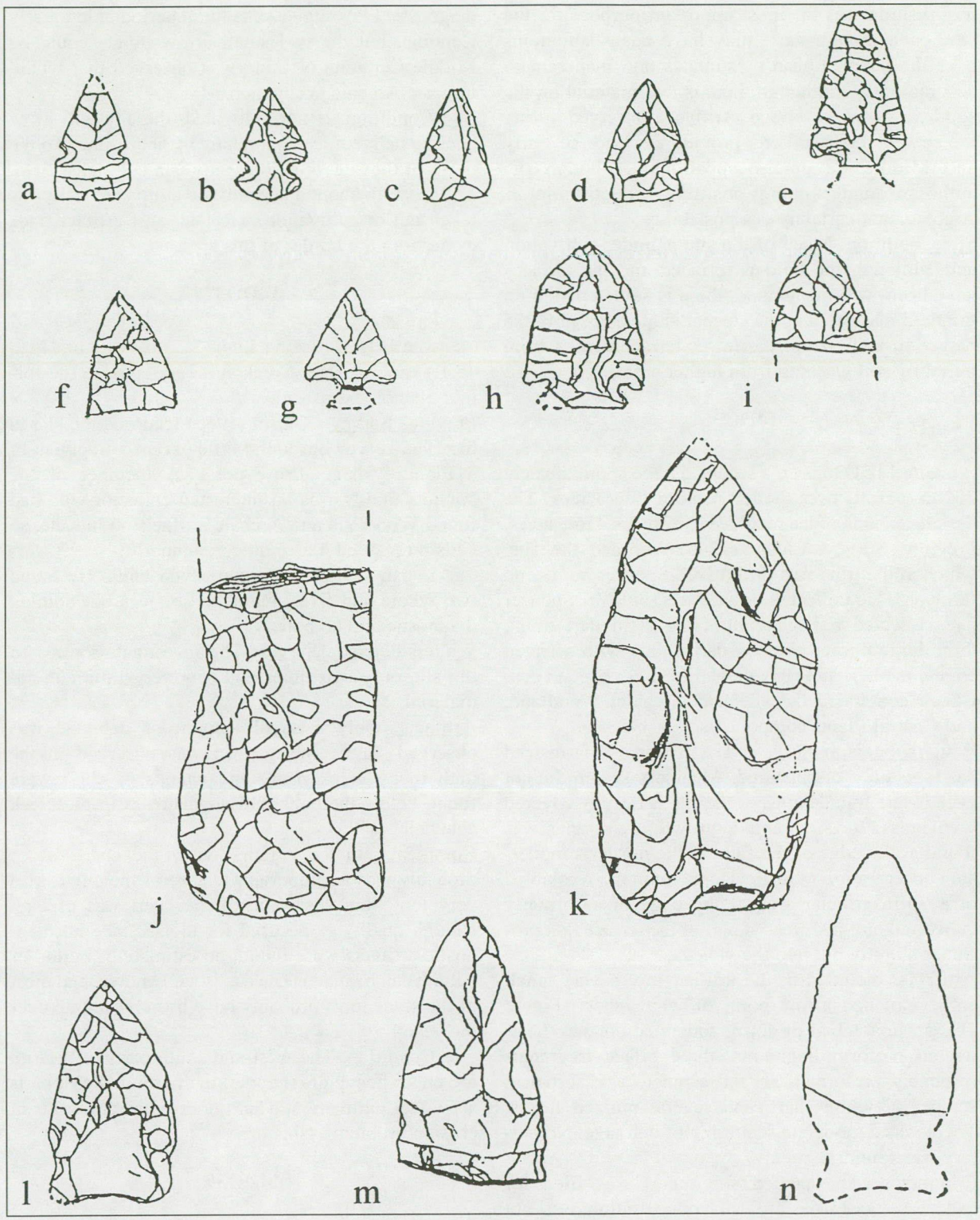


Figure 5. Artifacts a-i are from various sites. A and c are from 14DO16; b, from 14DO36; d-f, from 14DO412; g, from 14DO411. H and i, representing a very excurvate style, are from 14DO35 and 14DO39, respectively. J and k from 14DO406 are probably knives. L and m also are from 14DO406. N is a composite drawing of a series of bifaces found earlier on 14DO406 (see Figure 7). It closely matches an artifact, which is on file at the University of Kansas, found by Chism on 14DO58. Drawings are actual size.

tool making was the most important purpose for the site, even though there may have been habitations over the years. Logan's estimates and map remain accurate today, although there is less material on the southern or lower terrace. Artifacts, observed during the survey reported here, provide evidence of Early and Middle Ceramic occupations. Although the authors found nothing positively identifiable as Archaic, that certainly is a possibility.

Site Condition. Much of the site is under cultivation and, although the field is terraced and the terraces have been well maintained, there is some erosion on the field margins and the steeper slopes. Possibly the reduction in finds on the lower terrace results from burial by soil washing from higher areas.

14DO36

Site 14DO36 is on a second terrace approximately [redacted] The designated area of the recorded site covers 4 to 5 acres.

Previous Survey. Chism (1966) recorded the site, which at the time was the Russell Spencer home and farmyard. He collected no artifacts, but Mr. Spencer had collected a large contracting stem dart point, three large corner-notched dart points with serrated edges, an alternately beveled knife, and a ground celt. Chism concluded the site had Archaic, Woodland, and Central Plains components.

Walters/Peterson Survey. The Spencer's farmstead has long since disappeared. A cursory search did not even locate foundations, as the site is heavily covered with grass, trees, and undergrowth. A scraper was found at the edge of the field to the north. A moderate concentration of artifacts and debitage was noted in a 30-m circular area at the edge of a formerly cultivated plot just west of part of the terrace that protrudes slightly out into the valley.

Artifacts. Included in the artifacts are a very small corner-notched arrow point of white chert (Figure 5b), an unnotched preform, four medium-size heat-treated preform fragments, three biface fragments (probably preforms), an end scraper, a resharpened scraper of white chert, and several utilized flakes. There was a moderate scattering of debitage. No pottery was found.

Comments. An updated site report was filed for two reasons: 1) the area of concentration was not included the originally designated site area, and 2) a better plotting of the location would allow some later surveyor to relocate the site.

The artifacts suggest that this part of the site was used as a stone tool-making area. Some of the diagnostic tools suggest a cultural period of late Early Ceramic, but the two small arrow points could be Middle Ceramic. Nothing was observed that would indicate Archaic occupation.

Site Condition. If not cultivated, the site will grow back to native grass in a relatively short time. To the north of the site, there presently is a cultivated field. To the south about 3 acres of the cultivated field was taken out of cultivation in 1994. Most artifact finds came from the border of this area.

14DO37

Site 14DO37 is on a high (3.7- to 4.6-m or 12- to 15-ft) bank of Deer Creek and very close to the [redacted]

Previous Surveys. Chism (1966) recorded the site in his 1965 survey but found little except a fragment of a Plains Village arrow point. A member of the Nichols family was an interested collector who had found Woodland and Archaic artifacts on the site, so Chism regarded it as multicomponent.

Logan (1987) excavated seven units. He found two whole and five fragmented bifaces but nothing diagnostic and no pottery.

Walters/Peterson Survey. The investigators were on the site only two times and saw very little cultural material.

Artifacts. Only a small amount of debitage was observed. Some intact chert was observed in the high rocky creek bank, and chunks of chert were found below the bank and downstream in the creek channel.

Comments. In the authors' view the chert source probably was an important feature of the site over a very long time, as some of the chert was of high enough quality to be used for tools. Since no diagnostic artifacts were found, no estimate of period or culture can be made. The site is well known, and most of the stone tools probably have been picked up over the years.

Site Condition. The west and south parts of the site are under heavy grass cover; the north and east parts are under cultivation. There does not seem to be an erosion problem at this time.

14DO39

Site 14DO39 is situated in the approximate center of a 20-acre plot on a first terrace close to the right bank of Deer Creek. There is a very light scattering of artifacts over about 4 acres, and most of the materials are concentrated on and around a low knoll.

Previous Surveys. Chism (1966) found 2 blade fragments, 2 unfinished projectile points, and 10 potsherds. He described the latter as Woodland, although Logan (1987) felt that the temper described probably indicated Pomona. Logan considered the site size to be 4,700 m^2 (15,420 ft^2). He dug a backhoe trench and four test units. One unit had artifacts down to 30 cm; the others, to only 20 cm. None of the 16 stone tools, including a scraper, graver, and two utilized flakes, were considered diagnostic. The 66 sherds found included 2 rims and 15 analyzable body sherds. The rims were determined to be Pomona ware, and Logan concluded that the site was a Plains Village campsite.

Walters/Peterson Survey. Locating this site was difficult due to map problems and unfavorable weather in the spring of 1993. The first visit was in April 1993, and nine return trips were made. Although there was enough lithic material to confirm the area as a site, from the beginning most of the finds were potsherds.

Artifacts. Artifacts included a biface section (either a knife or large dart point), a broken bifacial drill, a unifacial scraper, the distal section of a small excurvate projectile point (Figure 5i), utilized flakes, debitage, and pieces of manos or hammerstones. Four rim sherds, 3 neck or shoulder sherds, and 35 body sherds were found. This was the only site in this survey that provided good evidence of pottery decoration. Details are provided below:

Rims:

1. 3.5 by 4.0 cm, 8 mm thick; sand temper; dark brown outside, tan inside, gray core; exterior vertically cordmarked, interior smooth but tool marked.
2. 2.0 by 2.2 cm, 7.5 mm thick; sand and a small amount of clay temper; tan outside, gray inside, gray core; smooth surfaces, oblique decorative marks on the lip.
3. 2.2 by 2.2 cm, 7 mm thick; coarse sand temper; tan outside and inside, brown-gray core; cordmarked, oblique decorative marks on lip.
4. 1.5 by 2.3 cm, 5 mm thick; sand temper; straight horizontal cord or tool impressions of uniform depth, 5 mm below the rim, just above a flat, slightly raised ring, 3 mm wide. Another horizontal impression may lie just below the ring, but it cannot be seen well due to the break point of the sherd.

Necks or shoulders:

1. 1.8 by 1.8 cm, thickness varies from 4.5 to 8 mm; sand temper; brown outside, tan inside, gray core; curved, outside marked.
2. 2.4 by 2.7 cm, thickness varies from 5 to 7 mm; sand temper; brown outside, tan inside, gray core; outside marked.
3. 2.1 by 1.5 cm, thickness varies from 5 to 8 mm; sand temper; tan outside and inside, gray core; protruding, decorative rim assumed to go around the vessel.

Body sherds:

1. 1.4 by 2.5 cm, 5 mm thick; sand temper; light gray outside, tan inside; decorated with a very straight and uniform channel or line, measuring 3 mm wide and 2 mm deep. The bottom of the channel is uniformly "wavy," probably made by pressing a tool on malleable clay. A finger dent inside possibly shows support while pressure was being exerted on the outside. This obviously was not done by a novice.
2. 33 specimens; thicknesses vary from 11 to 2.5 mm, mean is 5.5 mm; 13 sand temper, 10 grog temper, 3 grit temper, 7 no temper or unable to determine; predominately tan but some gray or orange outside, inside the same but some blackened, gray cores; most are cordmarked.

One bone artifact appears to be a bead or ornament. The 1-cm-long oval section of bone has a diameter of 11 mm by 6 mm. The piece has a hole through the center, obviously cut. It is light gray in color.

Comments. These finds appear to conform to Logan's determination that the sherds are mostly from Pomona ware and that the site was a Plains Village camp. The scarcity of lithic material compared to the number of sherds seems unusual but is similar to Logan's experience. There is heavy pedestrian traffic through the site. Most of the stone tools may have been picked up even before Chism's survey in 1965.

Site Condition. The site continues to be cultivated, but the low slope prevents much erosion damage.

14DO40

Site 14DO40 is on the left bank of Deer Creek and slopes to the south.

Previous Surveys. Chism (1966) recorded the site but found very few artifacts. However, one, a small triangular arrow point, is diagnostic. Logan (1987) mapped the site as a rectangular area of about 3 acres, which extends north from Deer Creek with an east-to-west tree line across the center, dividing it into two fields. He dug three tests in the lower field, found some pottery, stone tools, and debitage, and was able to recognize a Middle Ceramic culture.

Walters/Peterson Survey. The investigators visited the site six times. A few artifacts were found around the east, south, and west edges of the south field, where there are some small erosion ditches.

Artifacts. Fragments of possible manos or hammerstones, one biface fragment, one medium-large

projectile point, one utilized flake, debitage, two potsherds, and heated rock pieces were found.

Comments. The limited evidence found may suggest a habitation site, probably Middle Ceramic in age. There may be more buried artifacts in the southern part of the field.

Site Condition. The north half now is covered with native grass and brush, while the south half, which was under cultivation as late as 1992, is covered with weeds and grass. The site is well protected from erosion.

14DO41-42

These two side-by-side sites on the right bank of Deer Creek, originally recorded as 14DO41 and 14DO42, have now been consolidated.

Previous Surveys. Chism (1966) recorded the two sites and noted that 14DO42 was only 50 yards southeast of 14DO41 and might be an extension of that site. He found a contracting-stem dart point and a broken preform on 14DO41 but only utilized flakes on 14DO42. He thought that the contracting-stem point might indicate that the site was Archaic. Johnson (1968) dug seven squares on 14DO41 and found nothing below the plow zone. The 1 rim and 27 body sherds that he recovered are mostly cordmarked with shale, grit, or sand temper. He found two small points, one large corner-notched dart point with convex edges and base, possibly a Snyders type, as well as scrapers, oval knives, and part of a ground ax. He concluded that it is a Central Plains tradition site.

Walters/Peterson Survey. The investigators had excellent visibility on two early survey trips and believe the site has changed considerably in the last 30 years. It is in a cultivated field on a moderate slope with 14DO41 lower than 14DO42 to the southeast. Erosion may have caused a portion of 14DO41 to be silted over, while 14DO42 has been partly uncovered. Many items were collected between the two areas, and the authors saw no benefit in trying to distinguish between them. An updated site report, combining the two areas, was filed with the KSHS.

Artifacts. When visibility was good, the investigators had little trouble finding flakes, chert chunks, and other lithic debris, but diagnostic artifacts were scarce. Three bifaces were found, two probably preforms for small projectile points and the other a somewhat crude, small, contracting-stem point or possibly a hafted knife. There were also several hammerstones, one very worn with use, and two or three possible manos. A large flat piece of quartzite, 1.8 cm in diameter, with battered edges may have been a metate, but it showed little wear. Ten sherds were found, mostly small with grit or grit-and-sand temper and a smooth surface. One exhibits tool marks not made with cord. The mean thickness of the seven intact sherds is nearly 8 mm.

Comments. Based on the artifacts, particularly the rather thick sherds with grit temper, the authors think that the primary occupation may have been during the Early Ceramic period, possibly the Deer Creek phase. Chism's large contracting-stem dart point at the University of Kansas Museum of Anthropology is added evidence of something earlier than Central Plains tradition.

Site Condition. As noted above, considerable erosion has occurred on this site in recent years.

14DO68

Site 14DO68 is on the first terrace on the right bank of Deer Creek near the eastern edge of a large field.

Previous Surveys. Johnson (1968) tested extensively and found nothing below the plow zone. He found 2 small triangular arrow points (1 unnotched and 1 side notched), 5 knives, 4 biface fragments, scrapers, hammerstones, and 39 potsherds, of which 25 were cordmarked. Logan (1987) estimated the site to cover 2,000 m^2 (6,562 ft^2) along the creek bank. He excavated four units and found debitage, one retouched flake, and four potsherds, one of which was large enough to identify as Pomona. The small amount of material found below 20 cm was thought to have been disturbed by rodents. He listed 14DO68 as a possible Pomona variant site.

Walters/Peterson Survey. On the first two visits in 1993 the investigators observed scattered lithic debris but not enough evidence to identify a specific site. Early in 1995 in an area with a moderate scatter of debris, a variety of artifacts were found, as listed below. On a later trip the debris area was evident, but no worked stone or potsherds were found.

Artifacts. During the 1995 trip investigators found a "classic" hammerstone, two resharpened flakes, a utilized flake with two notches possibly to facilitate hafting, and two biface fragments, which probably were preforms for small projectile points. Two potsherds, one with sand temper and cordmarking and the other too deteriorated to provide evidence of marking or temper, were collected.

Comments. Nothing was found in variance with earlier conclusions that 14DO68 dates to the Middle Ceramic period and may well be a Pomona variant site.

Site Condition. The site continues to be cultivated but shows little signs of erosion damage.

14DO73

Site 14DO73 is located about 200 m (656 ft) from the left bank of Deer Creek.

Previous Survey. The site was recorded by a University of Kansas crew but was not described in a published report.

Walters/Peterson Survey. The site, only 50 to 60 m (164 to 197 ft) in diameter, was located in a cultivated field. Although most of the field was searched, no concentration of debris was found elsewhere.

Artifacts. On the first trip there was a light scattering of lithic debris with a few flakes and a unifacial tool, probably a scraper. Three subsequent trips produced a mano, hammerstones, cores, resharpened flakes, a broken medium-large preform, and other preform fragments but no sherds.

Comments. The preforms were medium-large, but no diagnostic artifacts were found, and a time period for the site cannot be identified. It seemed unusual to find so much debris and no finished tools or potsherds.

Site Condition. The site is under cultivation now and may have been for nearly a century. There seems to be no serious erosion. The site is very subject to collecting, and that may be the reason for the absence of stone tools.

14DO75

Site 14DO75 is in the south part of a large field, near the lowest elevation in the field. It is approximately 200 or 300 m (656 to 984 ft) south of 14DO68 on the right bank of Deer Creek.

Previous Survey. Logan (1987) found no cultural material on the surface so was unable to determine site boundaries. He shovel tested and excavated 4 units but found only 10 pieces of debitage and 1 bone fragment. He listed it as a possible Plains Village site.

Walters/Peterson Survey. The investigators had trouble specifically identifying this site and never found a concentration of debris sufficient to be sure that they were on the recorded site.

Artifacts. Finds were scattered — a biface fragment near the east edge of the field and a uniface, possibly a scraper, farther to the west. A few scattered pieces of debitage and other rock debris were seen on the four inspections of the site area, but nothing diagnostic was found.

Comments. The scant finds provided no basis for identifying a period or culture.

Site Condition. The site now may be covered with silt from higher levels of the field. No further action is recommended.

14DO141

Site 14DO141 is 15 or 18 m (50 or 60 ft) above the Deer Creek flood plain in a cultivated field. It [redacted] from the northwest.

Previous Surveys. The Iroquois Institute crew (Chambers et al. 1977) estimated the size of the site to be 1,500 m^2 (4,921 ft^2) and collected 55 flakes from the surface and 3 more from 2 shallow (20-cm-deep) test units. They did not determine a cultural affiliation. The site was under cultivation at the time.

Logan (1987) estimated the site to be much larger, possibly 12,500 m^2 (41,010 ft^2). His team excavated five units and found a few flakes, two informal tools, the base of a corner-notched dart point, and another biface but no ceramics. On the surface they found four other bifaces and a scraper and concluded that the artifacts might indicate a Plains Village presence.

Walters/Peterson Survey. The investigators became interested in this site because it is on a hill overlooking the new sites, 14DO415 and 14DO416, although somewhat farther north. The more southerly part of the hillside was searched rather thoroughly for debris or artifacts that might have washed down from sites on the hill; however, nothing was found. This was convincing evidence that the materials on 14DO415 and 14DO416 resulted from cultural activity on those sites.

Artifacts. Down the hill on the flood plain west of 14DO141, a medium-large projectile point, a fragmented biface, and a few flakes were found. As these items were found closer to 14DO141 than any other recorded site, the one retained artifact was catalogued under that site number. When the investigators visited this site in the fall of 1994, it was planted to wheat. Without penetrating too far into the field they found possible cores, flakes, and other pieces of chert, confirming the presence of a site. On brief visits later they went into the field somewhat farther with the same result — plenty of lithic items but nothing diagnostic and no potsherds.

Comments. The authors cannot estimate the size of the site as they have not been over all of it. However, the material observed indicates a workshop site where stone tools were manufactured.

Site Condition. Although the site has been under cultivation for many years, erosion does not seem to be a serious problem. The lower part of the field is fairly level, and a row of trees stands on an uncultivated strip between the field and the steep hillside sloping down to Clinton Lake.

14DO410

Site 14DO410 is in a large field on the left bank of Deer Creek.

Walters/Peterson Survey. In walking across the field on the way to and from other prehistoric sites, the investigators noted rock debris in several areas. Three of these spots contained chert cores, flakes, possible hammerstones, and other evidence of flintknapping. Although none of them showed enough evidence to justify recording them as separate sites, the three areas were close enough together to be related in some way. The authors proposed to the KSHS Archeology Office that the three zones plus a fourth zone, where a section of a very old projectile point had been found, be incorporated into one large extended site. This suggestion was approved, and the site was recorded as 14DO410. Investigators were on each zone, except Zone 1, from 8 to 12 times. Some inspections were quite thorough; others were more of a slow walk-through. Zone 1, where the old projectile point was found, is in the field a few meters from the wildlife parking area. Zone 2 begins at a shallow ditch 30 m (98 ft) to the east, where a classic hammerstone, cores, chert chunks, flakes, and other debris were found. Zone 3 is 80 m (262 ft) to the southeast and appears to be a workshop area with considerable debitage. Zone 4 is farther southeast and may have had a structure as one piece of daub, potsherds, some worked stone items, and debitage were present.

Artifacts. All zones, except Zone 1, had heat-modified rock, debitage, possible hammerstones, and manos or fragments of manos. The square-stem projectile point fragment cannot be positively identified as the blade is missing. It is finely chipped, very slightly concave at the back, has ground edges, and has a good flute on one side. Archeologists say it is at least Archaic and possibly older. Observed in Zone 2 were a large, rather crude scraper, two utilized flakes of which one may be a preform, and a classic hammerstone with finger grips. Zone 3 yielded two utilized flakes, a thick uniface fragment, a small biface, the proximal end of a small preform, a mano fragment, and one sherd. The sherd is 6.8 mm thick and cordmarked. One piece of daub was found in Zone 4, along with a large preform, a round medium-size biface cutting tool, and one sherd. The sherd was a near rim or neck, somewhat thicker and curved at one margin, 6 mm thick, cordmarked, and tempered with coarse sand.

Comments. From the limited diagnostic artifacts available, it was concluded that the site is multicomponent. Whether any of the zones were directly related to the others is unknown.

Site Condition. This field has been farmed and pothunted for about a century. Artifacts continue to be exposed.

14DO411

Site 14DO411 is on a terrace part way up a hill that slopes down to the right bank of Deer Creek. [redacted] the site.

Walters/Peterson Survey. This new site was recorded in 1996. While surveying known sites nearby, the investigators noted this field and visited it for the first time in May 1995. A light scattering of debitage over some of the cultivated part and in the road was found. Later a large preform fragment, a small, stemmed arrow point (Figure 5g), two sherds, and several flakes and pieces of worked stone were found. In the road just south of the site, a local landowner found a well-crafted scraper, which he turned over to the University of Kansas Anthropology Department.

Comments. The very limited diagnostic finds suggest a culture early in the Middle Ceramic period or late in the Early Ceramic, but this assessment is tentative.

Site Condition. There is no information on whether the site extends into the grass-covered part of the terrace or how much the site was altered when two conservation terraces were constructed a few meters up the hill to the southwest. The part of the site under cultivation does not appear to have an erosion problem at present.

14DO412

Site 14DO412 is located on a low terrace on the [redacted] bank of Deer Creek in the [redacted] end of the same field as 14DO410. It is considered a separate site because it is 300 m (984 ft) or more from the closest zone of 14DO410. In addition it is [redacted] of what may be a former channel of Deer Creek; thus, it may have been on the [redacted] bank of Deer Creek at one time. The heaviest concentration of material covers about 50 m^2 (164 ft^2), centered around a low knoll.

Walters/Peterson Survey. The site was discovered in March 1993 by Daryl Walters, when he noticed lithic debris in the area and found a potsherd and a small preform or scraper. The site was recorded in September 1996, and the investigators returned to the site 11 times.

Artifacts. Lithic finds included cores, hammerstones, chert chunks, flakes, and other debris scattered over the knoll and some of the surrounding area. Three arrow points were found: a corner-notched Scallorn type with stem missing, a small expanding-base point, and a small unnotched point, the latter two being complete (Figure 5d-f). Other lithic items are a bifacial scraper or cutting tool of high quality tan chert and the proximal end of a crude unifacial tool, scraper, or preform. Potsherds totaled 20. All are body sherds except one, which is probably part of a base and is 11 mm thick. All have grit or sand temper except two. One is tempered with clay and an unidentified black material, and two are so deteriorated that the temper could not be identified. Some temper is quite heavy, grit or sand. Only 3 sherds had smooth surfaces, 14 are cordmarked, and 3 are not determinable. Eight of the cordmarked sherds had been smoothed over, so the marks were faint. One sherd was 11 mm thick, 10 were 7 to 9 mm thick, and 9 were 4 to 6 mm thick, with an overall average thickness of 6.7 mm. Sherd size was a little larger than on some sites; all but 4 were 2 by 2 cm or larger, and 7 were 3 by 3 cm or larger.

Comments. With a small number of projectile points and no rims among the potsherds, any conclusion must be tentative. There is some evidence of more than one component. The Scallorn arrow point and the grit- and sand-tempered, cordmarked, and rather thick sherds may be evidence of an Early Ceramic group, while the small arrow points, particularly the unnotched triangular one, suggest a Middle Ceramic affiliation. Although no daub was found, fragments of hammerstones, manos, and pottery could be evidence of a habitation on the site. If only a single component is present, the general time period would seem to be late Early Ceramic or early Middle Ceramic.

Site Condition. The field in which 14DO412 is located is still under cultivation. When Clinton Lake is at a very high level, it may be at least partly under water. The east end slopes and is subject to moderate surface erosion. Although the authors do not believe it was known earlier, they have seen evidence of surface collecting on the site during this survey.

14DO415

Site 14DO415 is on the left bank of Deer Creek near its confluence with a small stream. The site is mostly inundated at pool level of Clinton Lake, but a portion is accessible when the lake is .6 to 1 m (2 to 3 ft) below pool. From a 1.2-m (4-ft) bank at the base of a hill to the [redacted] is about [redacted] The site is believed to be within this space with a diameter of about 40 m (131 ft). The heaviest concentration of artifacts has been in the southwest part of the site with a scattering over the remainder. A small stream from the northeast, formerly in confluence with Deer Creek, flows out of a small canyon with rocky sides about 4.6 m (15 ft) deep. Since Deer Creek has had a wide, flat valley in which to meander, it is the authors' view that the smaller stream may have been the water source that was the main attraction for 14DO415, as well as for 14DO416 on its opposite side. Although the stream has little water in it in dry weather now, it could have been a good source of water much earlier and may have provided a campsite many times for prehistoric people.

Walters/Peterson Survey. After locating the site in November 1995, the investigators returned to it six times. Later in the survey it was recorded as 14DO415.

Artifacts. Finds included 10 bifaces, 63 potsherds, 1 uniface, and a fragment of a ground and polished stone ax. Although the site has been thoroughly searched, no small arrow points have been found; the projectile points described below are large or medium-large. Two identifiable groups may be represented by these points/bifaces. One set of eight bifaces has the same general style: broad blades with wide, sharply expanding, convex stems. Some are well made, but most are rather crude (Figure 6a-f). A second set of two bifaces is very well crafted, longer, more lanceolate, and corner-notched with wide, short stems (Figure 6g and h). The two types were most likely not made by the same group of people, but both probably dated to the Early Ceramic period. Part of the pottery assemblage appears to be typical Middle Ceramic period ware with grog temper, thin sherds from small vessels (some with little or no visible temper), and no evidence of decorating or artistic shaping of rims. A second group of sherds may come from a single large pot, although it is possible that three or four pots are represented. This group has heavy grit temper, comes from larger vessels, and has thicker sherds. Some sherds contain grass or fiber in amounts too great to be accidental. To complicate the diagnostic problem, knobbing and possibly two different scalloped decorations occur on rim sherds. The knobbed potsherds definitely belong to the second ceramic group, but it is difficult to tell to which group the scalloped rims belong. This pottery seems to have several characteristics of some Early Ceramic period ware.

Comments. The authors believe that 14DO415 and nearby 14DO416 are important finds because of the

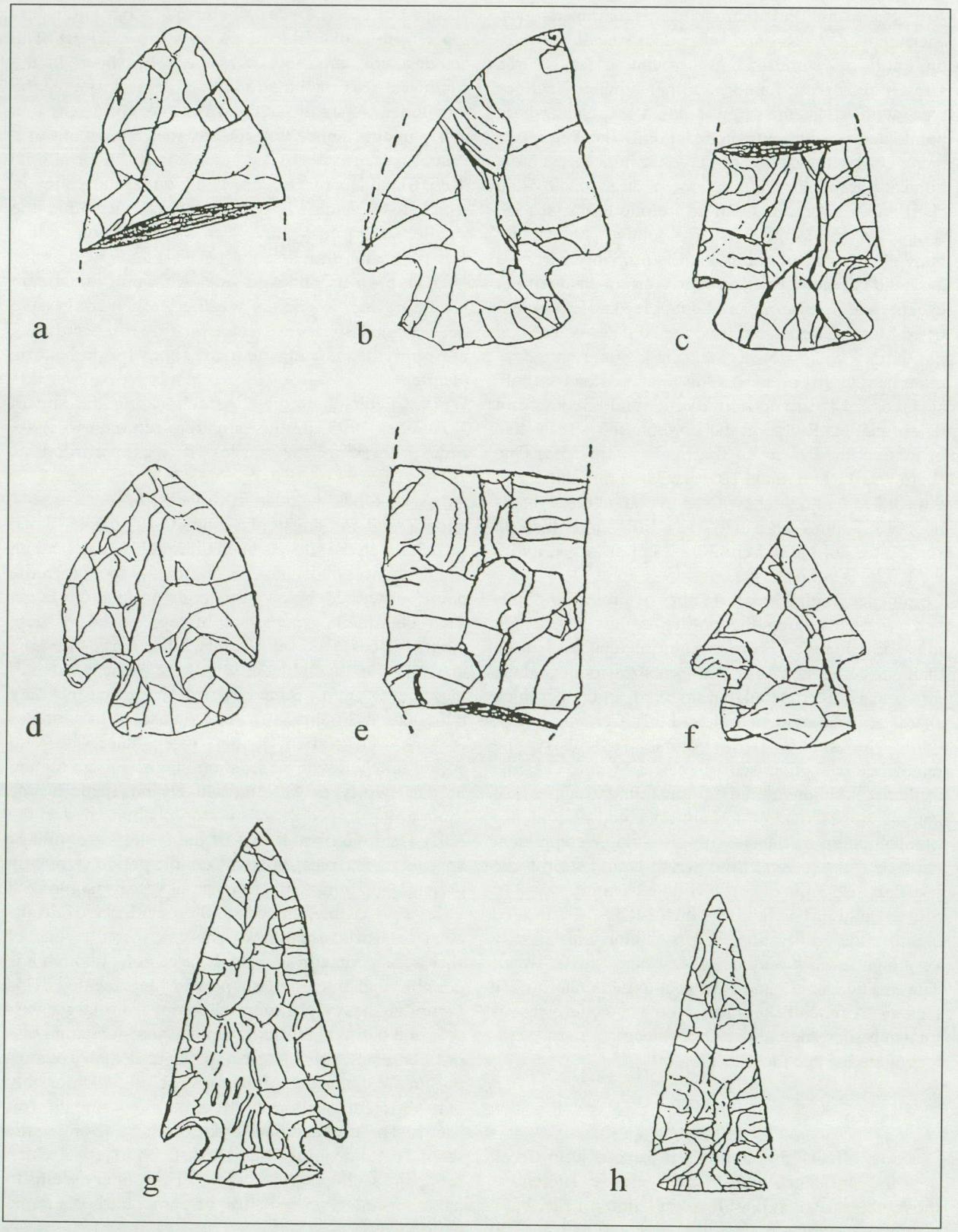
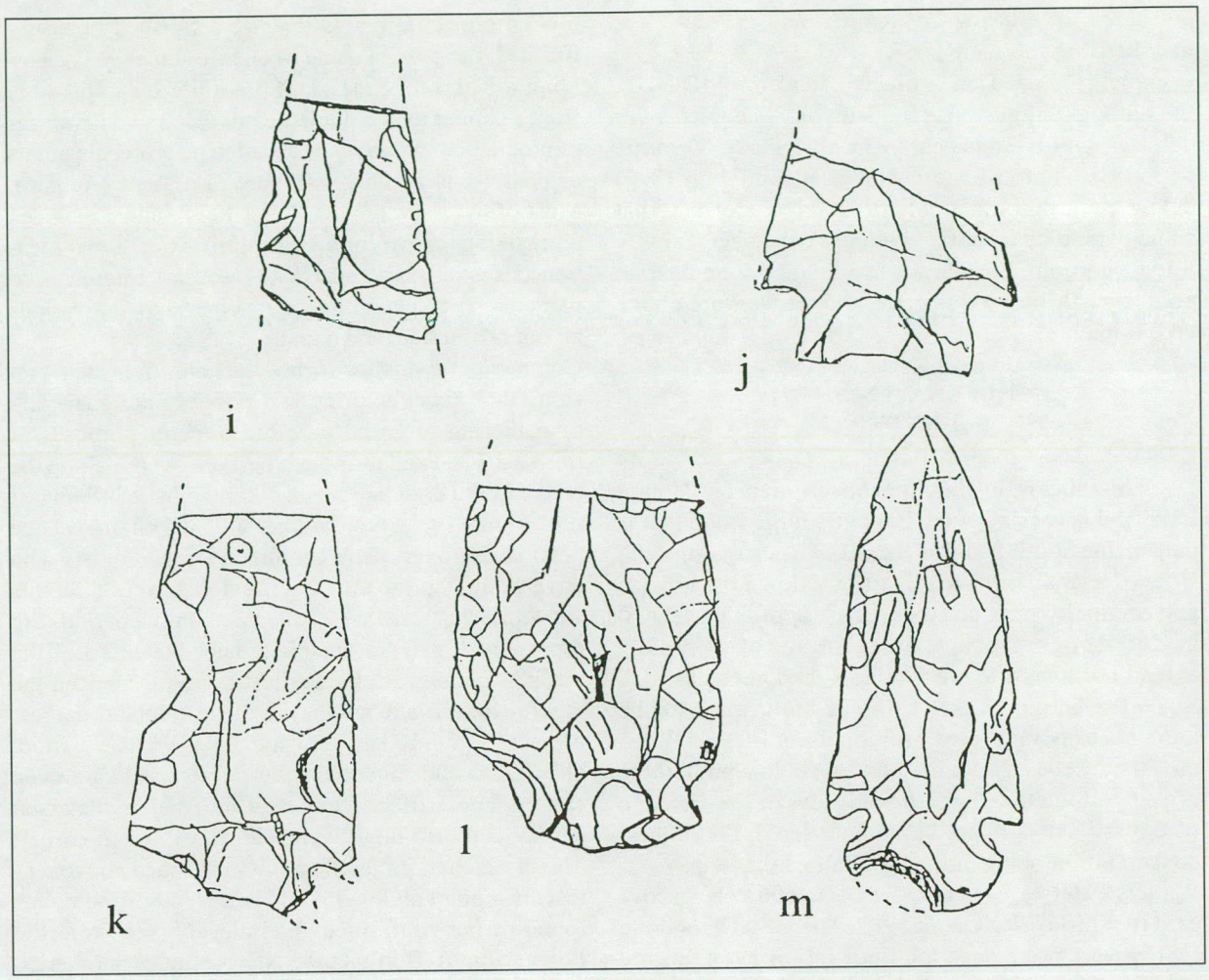


Figure 6. A–h are bifaces, found on 14DO415. I–m are bifaces, found on nearby 14DO416. All drawings on pages 80 and 81 are actual size.



large dart points and the complete absence of small arrow points. If the bow and arrow were not in wide use, the cultural period must have been very early in the Early Ceramic period. However, the absence of small projectile points and the presence of some probable Middle Ceramic pottery brings up the question of whether these sites have two components. Examination of the artifacts by professional archeologists may provide some answers, and further investigation of the sites also may be warranted.

Site Condition. Inundation has removed an unknown amount of soil from the surface of the site. It is also unknown if any artifacts remain in situ.

14DO416

Site 14DO416 was on the left bank of Deer Creek [redacted] The entire site now is inundated at multipurpose pool level.

Walters/Peterson Survey. The site was discovered and recorded in June 1996. With the lake at 1 m (3 ft) below normal pool level, part of the site becomes visible and can be visited. Site size was estimated to be 50 m (164 ft) in diameter, and the heaviest concentration of artifacts was in the center. The investigators did not see all of the site, and some of the artifacts were picked up from under water. Heavy rains shortly after the site was discovered prevented the investigators from returning.

Artifacts. Eleven bifaces, including fragments, and six potsherds were retained. Parts of manos, hammerstones, debitage, and other rock debris were left on the site. No small projectile points were found. All of the complete and partial bifaces are large. They include three corner-notched dart points and at least three other probable point fragments, as well as other biface fragments and a preform (Figure 6i-l). Those complete enough to have diagnostic value appear to be from the Early Ceramic period. There are some similarities within this set of bifaces, but they do not closely resemble either of the two types found on 14DO415, which is just across the stream. The

potsherds have heavy grit temper, and at least three may be from the same jar.

Comments. Based on artifacts found on 14DO416, the authors suggest that the site was occupied by a cultural group from early in the Early Ceramic period. If Clinton Lake again recedes to 1 m (3 ft) below multipurpose pool, it is recommended that some person be authorized to check the site again.

Site Condition. The site is very flat and inundated at pool level. All topsoil is gone, and artifacts are on the lake floor.

Rockhaven Site
14DO406

This site is in the Rockhaven area of Clinton Lake and is located [redacted] that is part of the [redacted] It also is on [redacted] and originally [redacted] The site may possibly extend northward to the [redacted] Since the Clinton Lake dam was built, most of the known site is inundated at normal pool level. When the lake recedes .3 to 1 m (1 to 3 ft) below pool, there is a strip along the shore on both sides of the drainage where artifacts still are being uncovered, the highest concentration being in the east half of the strip.

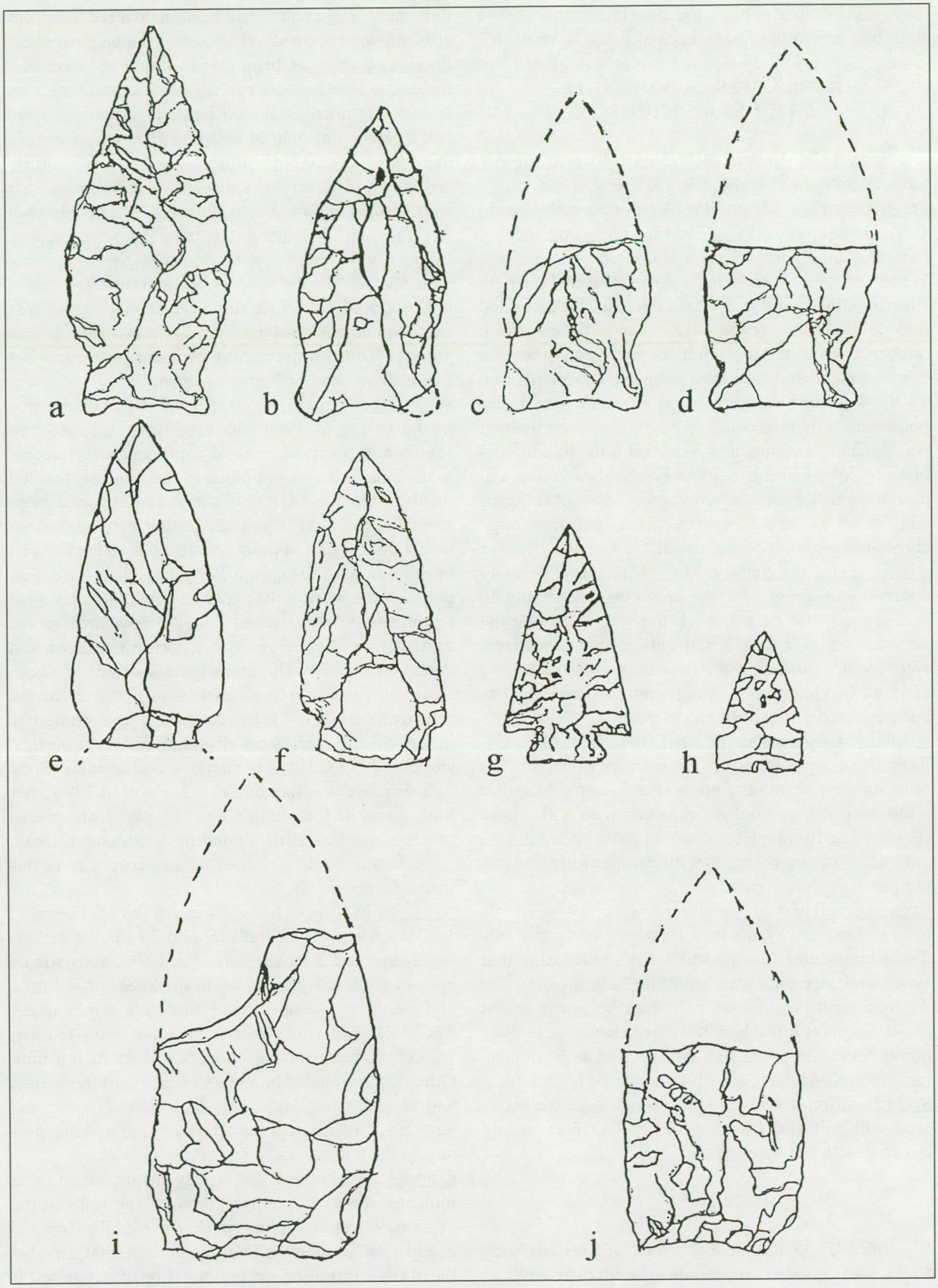
Walters/Peterson Survey. Site 14DO406 was discovered by Shirley Walters in 1987. The USACE and the KSHS were notified of the find, and in 1988 the site was recorded. Some of the artifacts discovered were retained and are on file at the KSHS (Figure 7). Others were viewed, recorded, and left on the site, and most of them have since disappeared. The investigators visited the site seven times but found little until the lake level receded .6 m (2 ft) or more below pool level late in 1995, making considerably more shoreline available for a search.

Artifacts. A total of 15 stone artifacts were retained, but no small projectile points and no potsherds were found. The retained artifacts are a complete projectile point of black chert with a slightly concave base, basal thinning, and some grinding along the sides; three broken projectile points that were finished or nearly finished; the proximal end of a knife somewhat resembling a Munkers Creek knife; a knife blade possibly from a similar tool; eight large bifaces in various stages of production, probably intended to be projectile points or possibly large knives (Figure 5j-n); and a uniface. Most of these are broken. Items not retained included a possible preform for a knife similar to the two mentioned above, numerous flakes, several fragments of worked chert, several hammerstones showing various amounts of usage, and a mano.

Comments. Evidence from the site indicates that stone tool manufacturing and possibly the quarrying or gathering of chert were the primary purposes of this site. The availability of chert uncovered along the banks of the drainage seems likely to have influenced the original selection of the site, which may have been in use over many centuries. Archeologists who have examined the artifacts previously found on this site agree that three widely separated time periods are represented in the assemblage and that more of the artifacts come from the earliest period than from the other two. In general they believe that the earliest projectile points date into the Late Archaic period, although some think that the points could be even earlier. The artifacts found on the Walters/Peterson survey conform quite well with those found earlier. The black chert projectile point mentioned above represents a point style with which several of the points found earlier conformed quite closely (see Projectile Point section). If in fact the site continues another 50 m (164 ft) to the former Rock Creek bank, there may be considerable more cultural material on the lake floor that could be salvaged some time in the future. It is known that the channel of the drainage or small stream has filled with silt, while the other areas are sterile soil or rock.

Site Condition. From the stumps of trees, it is apparent that there once was from .3 to 1 m (1 to 3 ft) of soil over most of the site before lake action removed it. Now all of the top soil is gone, leaving hard sterile soil and rock with a mass of sand and gravel above that moves with lake action. Within this mass artifacts are still being uncovered but not in the abundance

Figure 7. *(right)* These artifacts, found on 14DO406 prior to this survey, are on file at the KSHS and are presented here to further illustrate the types of bifaces found on this site. Artifacts a-d are similar to the Uvalde style, which is considered to be Late Archaic or earlier. These bifaces have been referred to as "owl points" as they resemble the outline of a great horned owl when viewed base up. E and f are similar but have damaged stems. G has been identified as Early Ceramic and h as Middle Ceramic, thus they represent later components on 14DO406. I and j probably are preforms and are shown to illustrate that the base thinning and concave stem were built in at a very early stage of the manufacturing process on at least some preforms. All drawings are actual size.


a
b
c
d
e
f
g
h
i
j

they were earlier. This condition is common for a shoreline site in the final stages of being destroyed.

Rock Creek (north) Sites
14DO56 and **14DO58**

Sites 14DO56 and 14DO58 are located on low terraces on the left bank of Rock Creek.

Previous Survey. Chism (1966) reported both sites in 1965. He interpreted 14DO56 as having Woodland and Central Plains components and 14DO58 as Archaic, Woodland, and Central Plains. Artifacts found on these sites by Chism and the local collectors he contacted include the following: on 14DO56 an expanding-stem projectile point, distal sections of two large bifaces, a small biface, and five grit-tempered potsherds; on 14DO58 a large corner-notched expanding-stem dart point with a thinned concave base that Chism thought was Archaic, a contracting stem point, the middle section of a long lanceolate biface (probably a knife), and part of a small triangular arrow point. A local collector had found a large lanceolate point and four large corner-notched dart points on 14DO58.

Walters/Peterson Survey. Site 14DO56 is mostly covered with grass, with the only open area being an [redacted] Although the general area of 14DO58 was quite clear, no artifacts were located. In fact, very little rock material of any kind was evident. This suggested that the site has been covered with silt in recent years.

Artifacts. Large pieces of chert, flakes, and one utilized flake were found in the road at 14DO56. The only diagnostic lithic find was a Langtry-like dart point with a long contracting stem with a flat base (Figure 4c). If complete, it would have been 5.5 to 6 cm long. Two body sherds with cordmarking and grit temper also were located.

Comments. Although conditions were not favorable for a surface survey, the investigators found some evidence that seems to support Chism's contention that Woodland elements were present. Nothing from the Archaic period was found, but the authors have seen a projectile point found by Chism that closely resembles points found on 14DO406, which most archeologists have termed Archaic, possibly well back in that era.

Site Condition. Site 14DO58 appears to be well covered with silt and weeds, while 14DO56 is mostly covered with tall native grass.

14DO59

Site 14DO59 is on a low terrace adjacent to Rock Creek. An updated site report was filed in 1997 as three new areas, which had been uncovered by recent erosion, were located to the east of the original site.

Previous Surveys. Chism (1966) found 12 potsherds, including 1 neck and 1 rim, all cordmarked with clay and sand temper. Lithic artifacts were a utilized flake and a biface tip. A local collector (Heine) previously had found several large projectile points, both corner-notched and square-stemmed, and two blades that were probably knives. In Chism's estimation both Archaic and Woodland components were present. Logan (1987) tested in the west part of the present site with four excavation squares and two trenches, one at the bottom of the terrace slope. Seventeen body sherds were found but no diagnostic lithic artifacts. Logan judged14DO59 to be a short-term campsite, probably Plains Woodland or Pomona variant.

Walters/Peterson Survey. On the first trip to this area in the spring of 1994, the investigators found two sherds and several pieces of daub near a dirt access road. The spot was not close to the location marked on the map for 14DO59, where nothing had been seen. On the next trip, after getting better information, Logan's datum point was located 100 m (328 ft) or more west of the spring 1994 find. Near the datum point on the west, flakes, a large core, and a possible hammerstone were noted. On the new area to the east, a large biface fragment or preform, a sherd, and daub were found. The investigators decided to consider the eastern area an extension (Zone 2) of the original site (Zone 1). In subsequent trips numerous pieces of red daub were observed down the terrace slope on both sides of the access road south of Zone 2. This place was named Zone 3. Early in 1996 after high water had inundated the site, numerous pieces of daub and 16 sherds, including 1 rim and 2 necks, were found north of Zone 2. That area was designated Zone 4.

Artifacts. In 6 inspections, 2 worked flakes, 1 scraper, 1 biface fragment or preform, and 20 sherds, including 2 rims and 2 necks, were found. The body sherds are mostly small, have a mean thickness of 4.8 mm, and have grog temper; only three are cordmarked. The neck and rim sherds also have grog temper, smooth surfaces, and a mean thickness of 6.6 mm. Other finds included hammerstones, mano fragments, and considerable daub. The daub is orange-red and very close in color to clay temper found in some pottery in the Clinton Lake region.

Comments. Although the survey history of the site indicates it may be multicomponent, the finds of the Walters/Peterson survey suggest a Middle Ceramic occupation, probably a Pomona variant, that used little if any decoration on pottery. Logan suggested it

may have been a temporary camp, but the expanded area detected during this survey may indicate longer, larger, or more frequent use. With daub appearing in three separated areas, the possibility of some sort of habitation should be given consideration.

Site Condition. The site is in a cultivated field, much of which is subject to flooding when the lake is 3 to 4.6 m (10 to 15 ft) over the multipurpose pool level. Zone 3, where artifacts currently are being exposed from having been buried, possibly for many years, would seem to be a good candidate for below-surface testing, when such activity is scheduled in the future. Numerous finds by at least one collector may account for the absence of stone tools on the site.

14DO60

Site 14DO60 is on a low terrace on the left bank of Rock Creek and is mostly covered with weeds and native grass.

Previous Survey. The site was reported by Chism (1966) in 1965. He interpreted it as a Woodland site. His finds included 2 blades, 2 corner-notched projectile points, some daub, and 15 cordmarked body sherds with sand temper.

Walters/Peterson Survey. The investigators visited this site three times. Chert debris was concentrated in two areas.

Artifacts. A large biface was thought to be a hand ax or chopper. Also found were hammerstones, a scraper, and the distal section of a large corner-notched projectile point with an expanding stem and a convex base (Figure 4e). The point had similarities to Snyders or Motley dart points.

Comments. The limited finds of the Walters/Peterson survey seem to support Chism's contention that Woodland elements are present.

Site Condition. Site 14DO60 is an uneven area with humps in one place and eroding ditches in another and is partially covered with heavy native grass. It probably was plowed at one time.

14DO62

Site 14DO62 is on the [redacted] of Rock Creek [redacted] The site is on a [redacted] that is covered with grass, weeds, cedar, and shrubs.

Previous Survey. Chism (1966) collected a few artifacts from the surface but interpreted the site by viewing a collector's finds, which included several large projectile points that he thought were Woodland or possibly Archaic. Whether the ground was cultivated at the time is not known, but part of the land very well could have been.

Walters/Peterson Survey. The site is difficult to access since the backed-up water is too deep to wade and there are no riffles. The only inspection was made in the winter by crossing on the ice. Although there was heavy cover, visibility was fair.

Artifacts. The investigators found some natural rocks but no artifacts.

Comments. Very little information was obtained at this location.

Site Condition. The site is well protected both by heavy cover that limits erosion and by a geographical setting that discourages collectors.

14DO413

Site 14DO413 is situated on a low terrace on the left bank of Rock Creek but quite a distance from the creek. It is on [redacted] It covers an oval of about 40 by 70 m (131 by 230 ft) and has a light to moderate scattering of debitage and some stone tools. A few artifacts were found in an access road just to the east of the site. The site may extend farther to the east in a grassy area, but that is not known for certain.

Walters/Peterson Survey. The investigators found this new site in March 1994, while looking for recorded sites in the area. They recorded it in September 1996 and inspected it five times. Although most of the artifacts were found on the first trip, something was found every trip, even after a flood when the field was solid cockleburs 3 to 4 ft high.

Artifacts. Two contracting-stem dart points, one broken and resharpened and the other the proximal section of a large point, resemble the Gary type (Figure 4a and b). Other biface fragments are one with either an impact fracture or a flute, a bitrangular distal tip made of white chert that is almost transparent (Figure 4n), and a biface preform proximal end that is very finely chipped. A uniface, probably a scraper, also was found. Some of the chert for these tools does not appear to be local. A potsherd with a smooth surface and heavy, coarse sand temper is 5.5 mm thick.

Comments. The lithic evidence suggests that an Early Ceramic, or even a Late Archaic, culture was present. Collectors and Chism found evidence of those periods on sites 14DO56, 14DO58, and 14DO60, less than half a mile away.

Site Condition. The site is under cultivation and flood prone. It is slowly eroding and probably could be further protected by letting it go back to grass.

Rock Creek (south) Sites

14DO15

Site 14DO15 is on the second terrace on the right bank of Rock Creek.

Previous Surveys. Chism (1966) recorded the site on a low terrace where a small tributary enters Rock Creek. He found two potsherds, two blade fragments, and a few flakes and concluded that the site has a Woodland affiliation.

Logan (1987) located the site on a T-2 terrace, which is closer to the tributary than it is to Rock Creek. He found the site to cover only 1,500 m^2 (4,921 ft^2). It showed some evidence of soil erosion and damage by a road through the west side. Logan dug 4 test pits, found 28 sherds and many flakes, mostly below 20 cm. Surface finds were two biface fragments and four potsherds. He judged the site to be a small hunting camp of Pomona variant affiliation.

Walters/Peterson Survey. Investigators made only two inspections of 14DO15. The first visit was somewhat limited by a soybean crop, but the site was located. The second inspection benefitted from improved visibility. The site seemed to center on a low mound immediately east of the road, but the road and the area to the west were also checked. Artifacts were found in a thin scatter over 100 m^2 (328 ft^2). The investigators also surveyed the area closer to Rock Creek, which they felt might have been where Chism found his material, but saw nothing.

Artifacts. The authors found three bifaces: a moderately large dart point of heat-treated chert with a stem somewhat like an Ensor type that was resharpened, a small shiny white chert arrow point similar to a Reed or Morris type that was damaged and appears to be resharpened (Figure 4l), and a large early stage preform fragment. Several flakes and some lithic shatter also were found but no potsherds.

Comments. Based only on very little evidence, there may have been an Early Ceramic component.

Site Condition. There is some erosion on the higher elevation, but possibly one-half of the site is covered with grass and weeds. With a road running through it, the authors recommend no further protection measures.

14DO16

Site 14DO16 is on a low terrace on the left bank of Rock Creek. The field was cultivated until 1993. The site begins [redacted]

Previous Surveys. Chism (1966) recorded the site and found three small corner-notched arrow points and debitage.

Logan (1987) dug 6 test pits and found biface fragments, utilized flakes, and 42 sherds, including 1 rim. Some cultural material was found below 20 cm. He concluded that it was a Clinton phase, Pomona variant site, used for short-term occupations.

Walters/Peterson Survey. The site was located in 1994 and revisited five times. The site is estimated to cover about 1,200 m^2 (3,937 ft^2).

Artifacts. Lithic finds were five bifaces, including a small, white side-notched arrow point; a small, unnotched triangular arrow point; a large biface fragment (probably a knife); and an unidentified biface fragment (Figures 4i and 5a and c). A considerable amount of debitage was scattered over the site. The investigators found 15 sherds, including a moderately flared rim sherd. Five of the body sherds are cord-marked. Temper varies from light to heavy and is composed of clay or grog, sand, crushed sand or grit, and sometimes a mixture. Two of the larger sherds appear to be from small (15- to 20-cm) vessels.

Comments. Artifacts indicate a Middle Ceramic culture. The investigators found nothing that would conflict with Logan's assignment of the Clinton Phase of the Pomona variant.

Site Condition. In 1993 and 1994 the part of the field where the site is located was taken out of cultivation. During the period before grass and weeds covered the surface, there were heavy rains. The resulting erosion damaged the site. In time 15- to 30-cm (6- to 12-in) ditches appeared in several places, and one developed on the east side that was 31 to 46 cm (12 to 18 in) deep and 1 m (3 ft) wide. Grass and weeds completely cover the site now.

14DO19

Site 14DO19 is adjacent to a [redacted] and is generally known as the Hatcher site.

Previous Surveys. Chism (1966) recorded the site, but it had been known to artifact collectors for many years. He thought that the site was small and possibly of Woodland origin.

Johnson (1968) extensively tested the site and determined that it extended on both sides of an old stream channel. He established three areas: A near the center, C on the east side, and B on the west, which was being cut into by the creek. He found evidence of two structures and two storage pits and used the site in defining the culture now known as the Clinton phase of the Pomona variant.

Logan (l987) did extensive further testing. Of the sites he tested, he considered 14DO19 to be the best prospect for the National Register of Historic Places but did not recommend it for the register. He concluded that the Pomona occupation was more than a short-term camp and that there possibly was a buried Archaic component.

Walters/Peterson Survey. The site was visited four times. On the first inspection the investigators surveyed all three areas. Due to heavy grass and weed cover, artifacts were found only on the west side in Area B.

Artifacts. The finds included a large, stemmed biface (Figure 4d), the distal section of a biface (possibly a drill [Figure 4o]), four sherds with crushed-clay temper and an average thickness of 5 mm, a large (2.5 by 6 cm) piece of daub with unusually clear grass impressions, and a small fragment of burned bone. On three subsequent inspections only additional daub and debitage were observed.

Comments. The potsherds appear to be Middle Ceramic, and the two bifaces probably are compatible with that period also. The consistent appearance of daub in Area B may be evidence of a structure in that part of the site at one time; Johnson also found daub there but no structure.

Site Condition. The entire site was taken out of cultivation after Logan's report. Areas A and C are fairly well protected from erosion now by the heavy plant cover. Rock Creek continues to cut into the bank at Area B, and in September 1995 several tall trees had fallen into the stream or were being held only by their roots.

14DO414

Site 14DO414 is on a [redacted] immediately adjacent to the [redacted] bank of Rock Creek, where the creek [redacted] Site 14DO414 is a new site, which was recorded during this survey.

Walters/Peterson Survey. The site was discovered while surveying for new sites along Rock Creek in 1994. As lithic debris was visible, the investigators returned to the site twice. It was clear that part of the site had eroded away in the past. How much remains is unknown, but a grass-covered area extending to the northeast appears to have potential.

Artifacts. The investigators retained 2 large biface fragments, 2 small biface fragments, a sampling of 50 chert flakes (30 percent heat treated), 2 worn hammerstones, 1 abrader, and 2 potsherds with sand and grog temper.

Comments. Evidence indicates a workshop site for the purpose of manufacturing stone tools or component parts. Limited evidence indicates a Middle Ceramic presence, but that is a tentative conclusion.

Site Condition. The site is very slowly eroding away at the bank. The remainder is protected by heavy grass. No action is recommended until testing is done by professional archeologists. Shovel tests would be helpful to find the perimeter of the site and to make sure what is below the grass. The soil appeared to be thin (10 cm or less) over gravel or fragmented limestone. Debitage was abundant where the ground was visible.

Woodridge Primitive Area Sites

14DO45

Site 14DO45 is on the [redacted] bank of Dry Creek in the [redacted] and covers about an acre.

Previous Survey. This site was located in the 1960s by Chism (1966), who found a heavy concentration of debitage but very few stone tools.

Walters/Peterson Survey. When the investigators first came upon the site, they thought it was unrecorded but later learned it was 14DO45. They returned to the site twice.

Artifacts. Even though visibility was good on each visit, no potsherds were found. An abundance of debitage, including many small flakes, was visible on some parts of the site. Finds included one worn hammerstone, one large gray biface, one large white biface, and two medium-size white bifaces. All of the bifaces are fragments. As they were made from gray Plattsmouth, White Toronto, or a non-local white chert, it was surprising that the representative samples of surface flakes picked up were mostly tan Toronto chert. About 100 m (328 ft) northeast of the site, across a small drainage, there is about an acre of flat shoreline where big chunks of broken chert are scattered around. This might have been a source of chert near 14DO45. A search yielded no evidence of any type of quarry.

Comments. Based on very fragmentary information, the authors suggest that the site has a primary component that is Early Ceramic. That is a very tentative suggestion.

Site Condition. The field is well terraced and not eroding rapidly. No ditches of any consequence have developed.

14DO134, 14DO135 and 14DO136

Sites 14DO134, 14DO135, and 14DO136 are very similar sites in the extreme north and northeast

part of the Woodridge plateau. They are workshop areas that overlook the Dry Creek and Deer Creek valleys, 15 to 21 m (50 to 70 ft) below where Dry Creek and another small creek are in confluence with Deer Creek.

Previous Survey. These sites were recorded by Iroquois Institute on a survey for the USACE in 1976. At that time some of the area recently had been under cultivation. The Iroquois crew found considerable lithic debris on 14DO134 and 14DO135 and some on 14DO136. At 14DO136 they dug several test units but found little diagnostic material except a Bonham type arrow point and a point fragment with an expanding stem, which has a concave base and a small flute. They listed 14DO136 as a Plains Woodland site but made no determination on 14DO134 and 14DO135.

Walters/Peterson Survey. All three sites were relocated, based on light lithic debitage in the areas described and photographed by the Iroquois Institute crew. The Woodridge trail goes through 14DO134 and is adjacent to 14DO135 only 100 m (328 ft) to the southeast. Site 14DO136 is farther west and separated from 14DO134 by an unnamed creek valley.

Artifacts. Finds of a few flakes and a possible core justify no suggestion as to the time period of these sites.

Comments. After walking over a lot of Woodridge and relocating five sites (the three mentioned above plus 14DO137 and 14DO45), the investigators feel that there is further evidence that habitation sites are on low terraces close to the creeks. There probably are more workshop sites on the plateau, but finding them under current conditions would be very time consuming.

Site Condition. In the 1970s patches of this land were under cultivation, and information was available from local occupants. Now it is a sea of grass, shrubs, and trees; it is beautiful but not survey friendly. The possibility of unauthorized collection now is very low.

14DO137

Site 14DO137 is on the [redacted] bank of Dry Creek on a hill or ridge [redacted] above the Clinton Lake multiple purpose pool level. It is on the [redacted] Woodridge area.

Previous Surveys. This site was recorded by Iroquois Institute on a survey for the USACE in 1976. They found dense lithic debris over a considerable area but no diagnostic artifacts in seven test pits. They did find the proximal section of a projectile point that they identified as Paleoindian, which is on display at the Clinton Lake USACE Museum. This tool is well crafted and made of quality chert, possibly not local.

Logan (1987) dug 12 test pits that yielded considerable lithic debris, some utilized flakes, and a biface fragment but nothing diagnostic. He concluded that the site was a frequently used, short-term station, probably for hunting, and that the Paleoindian projectile point may have had no connection with the general use of the site.

Walters/Peterson Survey. On the first visit in 1994, heavy native grass covered most of the ridge. The investigators thoroughly examined a small strip just west of the high point, which had not been cut for hay, thinking it may have been left uncut to protect the site, but they found no lithic debris or artifacts. On the top part of the hill was a light scattering of debris with a much heavier concentration over about 1,500 m^2 (4,921 ft^2) in a poorly drained area in the center.

Artifacts. Large and small flakes, including some heat treated, were noted, as well as cores, cobbles with visible wear, and pieces of worked chert. Nothing diagnostic was found.

Comments. This site seems similar to other work areas in the vicinity. Nothing was found to identify with any time period.

Site Condition. The heavy plant cover provides fairly good protection for any site that may exist. On the first trip the investigators saw evidence of digging near the center of the area but did not know whether it was authorized or unauthorized. On a later trip no clear evidence of additional digging was seen.

Summary and Conclusions

The investigators identified and visited 27 previously recorded sites and discovered and recorded 7 new sites in the Clinton Lake project. This count eliminates 14DO42, as it has been consolidated with 14DO41 for reasons outlined in the Site Description section. The perimeters of several other sites have been changed or enlarged, based on survey findings.

All except two sites were visited at least twice, and most were checked five or more times. The investigators also searched for a few other recorded sites but failed, usually because of heavy vegetation, to find sufficient evidence to be sure of the location or to justify a written report. In searching for new sites, the investigators walked over many first and second terraces and hilltops, which seemed like good locations for outlooks or camps, only to find no evidence. Sites with remaining evidence are not everywhere nor are they easily located. This survey and the examination of the artifacts found has produced some corroborating evidence in support of the conclusions

reached by archeologists over the last 30 years of surveying, testing, and excavating sites in the Clinton Lake area.

The authors regard with particular respect the pioneering work of J. V. Chism and his associates, who recorded many of the sites in the Clinton Lake area, remembering that they often had to obtain permission and information from local landowners, some of whom were not too happy about leaving their land. The archeologists did not miss many sites that were exposed at the time. Like some of the subsequent investigators, this survey recovered material on several sites that called into question Chism's time period or cultural identifications. This seems understandable because (1) Chism, like the current investigators, was doing a surface survey and did not have the benefits of excavation or even shovel testing and (2) at the time of his survey, some large contracting-stem projectile points were considered nearly certain evidence of the Archaic time period, while information now has accumulated that their use may have extended into later periods.

During this survey it became apparent very quickly that the Deer Creek and Rock Creek valleys were heavily used by both Early and Middle Ceramic cultures. In particular, choice geographic locations may have been inhabited or used in some way many times, which makes identification of components difficult and uncertain, especially when using pedestrian survey only, and all artifacts are on one level.

The remainder of this discussion will be directed to three areas where there may be some new information or at least information of special interest to those who study prehistoric cultures: (1) The Late Archaic component on 14DO406, (2) new sites 14DO415 and 14DO416, which may have evidence from very early in the Early Ceramic period, and (3) 14DO39, where good evidence of decorated pottery, which may not be Maybrook phase, was found.

1. Site 14DO406 produced numerous artifacts before this survey project began. They are on file at the KSHS. Fifteen additional artifacts, mostly bifaces, were added during this survey. It is almost certain that there are artifacts remaining in the soil, sand, and gravel along the shoreline that is not inundated at normal pool level. What remains inundated on the lake floor within the 50-m (164-ft) strip from the shoreline out to the old Rock Creek channel is not known. What is in the inundated channel of the small drainage that ran into Rock Creek also is unknown. When and if the lake recedes to 1 m (3 ft) or more below normal pool, there will be a good opportunity to find more artifacts and learn more about the site. This site may be the oldest in the entire Clinton Lake region that has produced a significant amount of artifacts and still has a possible future potential.

2. Sites 14DO415 and 14DO416 are side by side, separated by a small drainage in confluence with Deer Creek. Site 14DO416 was the last site discovered in this survey. Shortly after discovering the site, heavy rains filled the lake to near pool level, and the investigators were unable to visit it again. On the one visit numerous artifacts were viewed, and several that were diagnostic were retained. All of the material appeared to be from a very early group in the Early Ceramic period or possibly from several small groups from the same general time frame. The authors believe that it is a single-component site. The pottery evidence matches the biface evidence very well, and no small projectile points were found.

Site 14DO415 just to the north was discovered earlier and was revisited six times. A relatively large amount of artifact material was found, and many diagnostic artifacts were retained. Because this site promised to be very informative about an early culture possibly related to the Wakarusa phase, the planned survey time was extended to include more visits. When the pottery was analyzed more closely, the investigators were surprised to find that part of the pottery assemblage did not match the Early Ceramic period. Some of the sherds appeared to be undecorated Middle Ceramic ware with sand and grog as the primary temper. Some thin sherds from small vessels had little or no visible temper.

A second group of potsherds, possibly from not more than three or four large jars, were thick and had heavy grit temper. There were no problems in identifying them as Early Ceramic except that at least three jars were decorated on the rims with knobs or scallops. Two wide, scalloped rims were from different vessels because the pattern was different. Another factor was grass or fiber impressions on some sherds, possibly from only one jar, that were too plentiful to be incidental. Considering these findings, what was expected to be a relatively positive identification of a single-component, Early Ceramic site now is much more speculative and involves more than one component.

The window of opportunity to gather additional data on this site is closed. When the lake may recede to 1 m (3 ft) below normal pool is unpredictable. Until it does happen, and investigators are able to collect more artifact material, what is now on file is all there is. As the authors are the only persons with experience on this site, they offer some further comments, including some quite speculative.

a. There is solid evidence of Middle Ceramic pottery, Early Ceramic pottery, and Early Ceramic projectile points. Small arrow points are missing from the assemblage.

b. The site is at a choice geographic situation on the edge of a valley near a spring-fed small stream and may have been used many times over the centuries. Possibly the effort to categorize the occupations in only two groups is an error. Perhaps archeologists with expertise in subdividing them by cultural groups can see evidence of several different occupations.

c. Possibly there are some small projectile points on the site that simply have not been found.

d. It may be that the earliest culture was an unidentified Hopewell-related group from an even earlier time. The large, broad blade, excurvate bifaces with large expanding stems and convex bases match well with some Kansas City Hopewell and also Cuesta assemblages. Knobs and scallops might also be compatible with some Hopewell-related groups.

e. The authors' understanding is that knobbing has been associated with the Maybrook phase. The investigators saw several sites in this survey that are thought to have Maybrook components but found no evidence except on 14DO415.

3. On 14DO39 Chism found 4 stone tools, none of which is diagnostic, and 10 potsherds that he described as Woodland. None of the sherds were reported to be decorated. Logan dug a trench and 4 test squares in which he found 16 stone tools, none of which were diagnostic, and 66 sherds, including 2 rims, most of which he considered Pomona ware. He recorded no decorated sherds.

The 5 stone tools found on the Walters/Peterson survey were not diagnostic, but the investigators were fortunate to find 41 potsherds, including 4 rims, 3 neck or shoulder, and 1 body sherd, all of which have evidence of decorating by either marking or shaping. These sherds were picked up over 10 trips and from over the entire site. It is a puzzlement that Walters and Peterson found decorated sherds and previous investigators did not. To summarize, there is some evidence on this site of two cultural groups in the Middle Ceramic period, one that used decorating and one that did not. The remnants of the group that did not decorate are much more plentiful.

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NOTES

Examination of Space and Symbolism in the Pawnee Earthlodge

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The examination of the Pawnee earthlodge for the perception and use of space in the structure by the culture has been conducted using the available literature on the Pawnee. The examination has revealed various themes in the evidence: religious symbolism is inherent in the structural space, kinship and marriage patterns influence lodge residency, sex and age set influence space division and its use in the lodge, and social ranking influences the size and possibly the directional orientation of the lodge. During this study problems were encountered concerning the real and ideal of residence patterning, the ownership of a lodge, and the importance of cosmological symbolism in the everyday life of the lodge.

The purpose of this paper is to examine the physical and symbolic use of space in the earthlodges of the Pawnee Indian culture. This examination covers aspects of the construction, spatial layout, daily usage, residence membership, and religious/cultural symbolism represented in and by the earthlodge to the Pawnee people. Information for the study draws from archeological, historical, and ethnographic sources.

The Pawnee are composed of four endogamous matrilineal (where members of the band marry within the band and trace lineage along their mothers' lines) bands: the *Chaui* (Grand), *Kitkehahki* (Republican), *Pitahauerat* (Tappage), and *Skidi* (Wolf). The Grands are considered the band of leaders, spokesmen, and moderators. The Skidi band claim common ancestry to the Arikara Indians along the Missouri River to the north. The other bands, often referred to as the South Bands, are related to the Wichitas to the south. The Pawnee are linguistically classified as Caddoan speaking (Wedel 1936:1).

The Pawnee in historic times lived in east-central Nebraska and Kansas and ranged in nomadic hunts into western Nebraska and Kansas. In the 1800s the Pawnee tribes and their territories were diminished by disease, warfare with the Sioux and white settlements, and reservation treaties. In 1875 the Pawnee moved to Indian Territory (present-day Oklahoma). Ethnography studies by Dorsey (1906), Murie (1981a, 1981b), Weltfish (1971), and Lesser (1930) were not undertaken until after the Pawnee had been removed to reservations. Historical accounts of the Pawnee by visitors in the 1800s provide a glimpse of the culture already altered by European contact.

The Pawnee inherited the earthlodge building tradition. Earthlodges appear in the archeological record of the Central Plains around A.D. 1000. They are associated with the remains of groups theorized to be ancestors of the Pawnee. The early earthlodges were rectangular in layout and were associated with a dispersed settlement pattern, where houses were scattered over the landscape. Over time the lodges became circular and often were concentrated in villages with fortifications in defensible positions. Some building traits persisted through time, including central support posts, secondary supports around an excavated floor, an extended doorway, a central hearth, earth covering, and interior cache pits.

Historic Pawnee villages were composed of several "mud lodges," ranging from a few dwellings up to several dozen in the larger villages (Figures 1 and 2). The circular Pawnee earthlodges were identified in excavations of the Lower Loup phase in central Nebraska. The sites contained historic trade goods, and locations were confirmed by historic documentation. The lodges ranged in size from 6 to 14 m (20 to 45 ft) in diameter. The central support posts varied from four to eight in number (Strong 1935:57). An increased number of central support posts allowed increased structure size. The size of a lodge may have been influenced by the number of inhabitants, as well as the availability of building materials. During the prehistoric and protohistoric periods the Pawnee may have required bigger lodges to accommodate larger extended families in village settings. This nucleation, or concentration of the population, seems to have been caused by increased competition for resources and warfare.



Figure 1. A view of the Pawnee village near Genoa, Nebraska, ca. 1871–1875. Photo is reproduced with the permission of the Nebraska State Historical Society.



Figure 2. Pawnee earthlodge on the Loup River, photographed by William H. Jackson in 1874. Photo (BAE neg. 1218) is reproduced with permission of the Smithsonian Institution, National Anthropological Archives, Bureau of American Ethnology Collection.

Earthlodge Construction

The first step in building an earthlodge was excavation of a circular floor area, 6 to 14 m (20 to 45 ft) in diameter and 30 cm (1 ft) in depth. The central support posts were 30 cm (1 ft) in diameter and were set into the ground in a square or circular pattern, approximately 1.5 to 3 m (5 to 10 ft) apart. These posts formed a central space in the lodge and acted as the major supports for the framework of the roof. Secondary support posts, approximately 25 cm (10 in) in diameter, were set at an outward angle around the edge of the excavation, approximately 2 to 3 m (7 to 10 ft) apart. The support posts were either forked or notched at the tops to allow horizontal stringers to be fixed atop them to connect the posts. Rafter poles were lashed radially, connecting the secondary and primary supports and providing support for additional covering material. The side walls of the lodge were constructed of smaller posts, sunk into the ground and lashed to the stringers of the secondary support posts. The slope of the outer wall and the out-sloping of the secondary posts around the excavation floor edge created a ledge, approximately 30 cm (1 ft) in dimension, around the lodge interior. This earthen platform served as seating, sleeping, and storage areas. After the domed framework was completed, it was covered with wattle and thatch. This in turn was covered with earth and blocks of turf, which served to seal and insulate the lodge from rain and wind (Figures 3 and 4).

The only openings in the lodge were a smokehole, 60 to 90 cm (2 to 3 ft) in diameter, in the center of the roof and an extended entryway at the side, 3 to 4.5 m (10 to 15 ft) long. The entry, constructed in a method similar to the main part of the lodge, was covered with thatch and earth. Ideally it was placed on the east side of the lodge. East-oriented entryways have been found in the majority of houses investigated archeologically; however, variations in the direction orientation were not uncommon (Chamberlain 1982:161).

Religious/Cultural Symbolism in Lodges

In Skidi origin myths the prototype earthlodge was built to house the first boy and girl put on earth. The boy was the son of the Sun (male) and Moon (female). The girl was born of a union between the Evening Star/Bright Star (female) and Morning Star/Great Star (male) (see sidebar and Figure 5). The lodge was constructed for them by the star deities, who were instructed by *Paruksti*, the Wonderful Being, who in turn was guided by *Tirawahat* or *Tirawa*, the All Being or "the expanse," who was the supreme deity of the Pawnee (Chamberlain 1982:159, 255).

Another myth tells that an ash tree stood at the center of the spot where the first lodge was built. The gods of the four world quarters set the four central posts around the tree. The gods of day and night set the entryway posts. The secondary outer posts were placed by the lesser star gods. After the stars had placed their representative posts, fire came down from the sky and burned the ash tree, leaving a hole that symbolized the central hearth (Chamberlain 1982:159).

A third myth says that, during the creation of the earth and heavens, *Tirawa* instructed the four quarter gods to stand around him with their hands touching

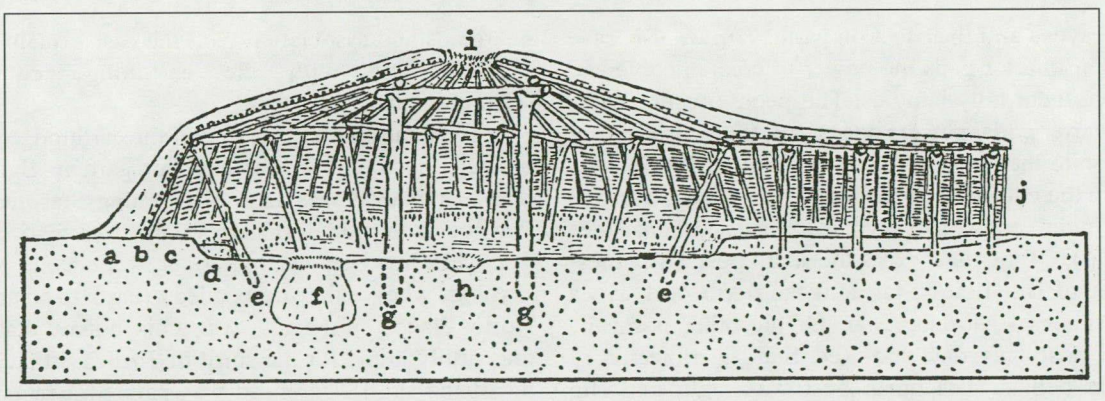


Figure 3. Cross section of a Pawnee earthlodge: a) earth covering, b) grass, willows, and outer poles, c) edge of house pit, d) altar, e) secondary roof supports, f) cache pit, g) primary or central roof supports, h) firepit, i) smokehole, j) entrance passage. Illustration is reproduced from Wedel 1936:44.

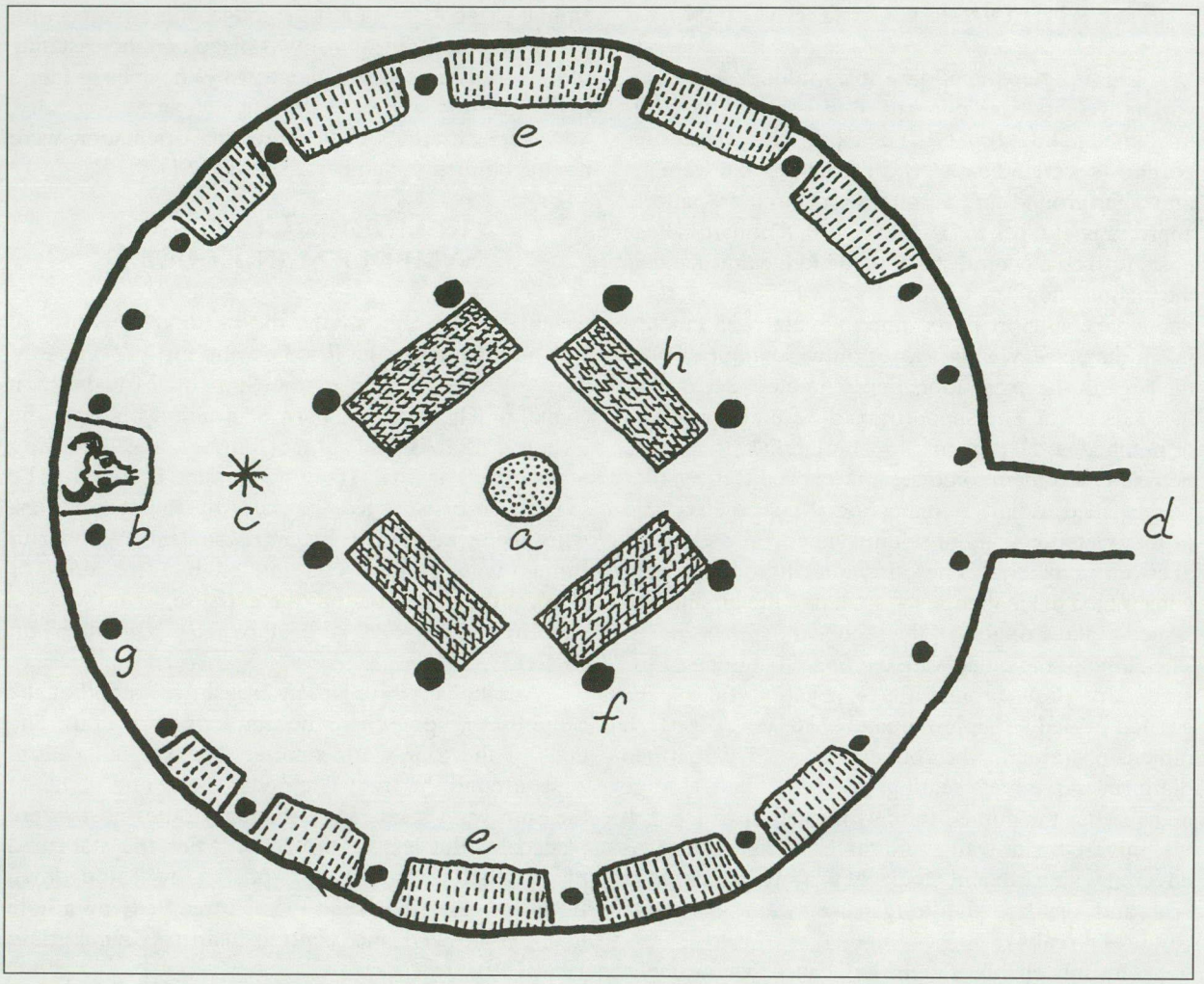


Figure 4. Stylized plan view of Pawnee earthlodge: a) hearth, b) altar, c) *wi-haru*, d) entryway, e) sleeping platforms and storage areas, f) central support posts, g) secondary support posts, h) mats around central hearth.

the heavens and their feet on earth. *Tirawa* also gave the four quarter gods the power to create people and to give them holy bundles. The people would know the quarter gods' powers because of their earthly connection to the heavens (Chamberlain 1982:212).

In the entryway of the lodge, two inner posts and two outer posts had symbolic associations (see sidebar). Of the inner posts the south post was a messenger of Big Black Star, and the north post was a messenger of Morning Star. Of the outer posts the south post was day and Red Star, a protector of human beings. The north post was night and Big Black Star, protector of animals. The eastern semicardinal points, Big Black Star and Red Star, were warriors for Morning Star of the east, the Pawnee creation god (Chamberlain 1982:95-100). Their role as guardians and association with the east explain their symbolic tie with the earthlodge entrance (Chamberlain 1982:180).

The altar on the west side of the earthlodge symbolized the Evening Star and her garden. Evening Star of the west was wife of Morning Star and the Pawnee earth mother (Chamberlain 1982:52-55, 97). The west direction was important as the camp of the sky gods whence they descended to earth to create the world. Placed on the altar was a bison skull that was the earthly home for the spirit of *Tirawa*. In the center of the skull's forehead was painted a rectangle, which represented the garden of Evening Star. Three lines, extending vertically from each end of the rectangle, were the rays of the rising and setting sun. The sunshine on the garden of Evening Star gave light and

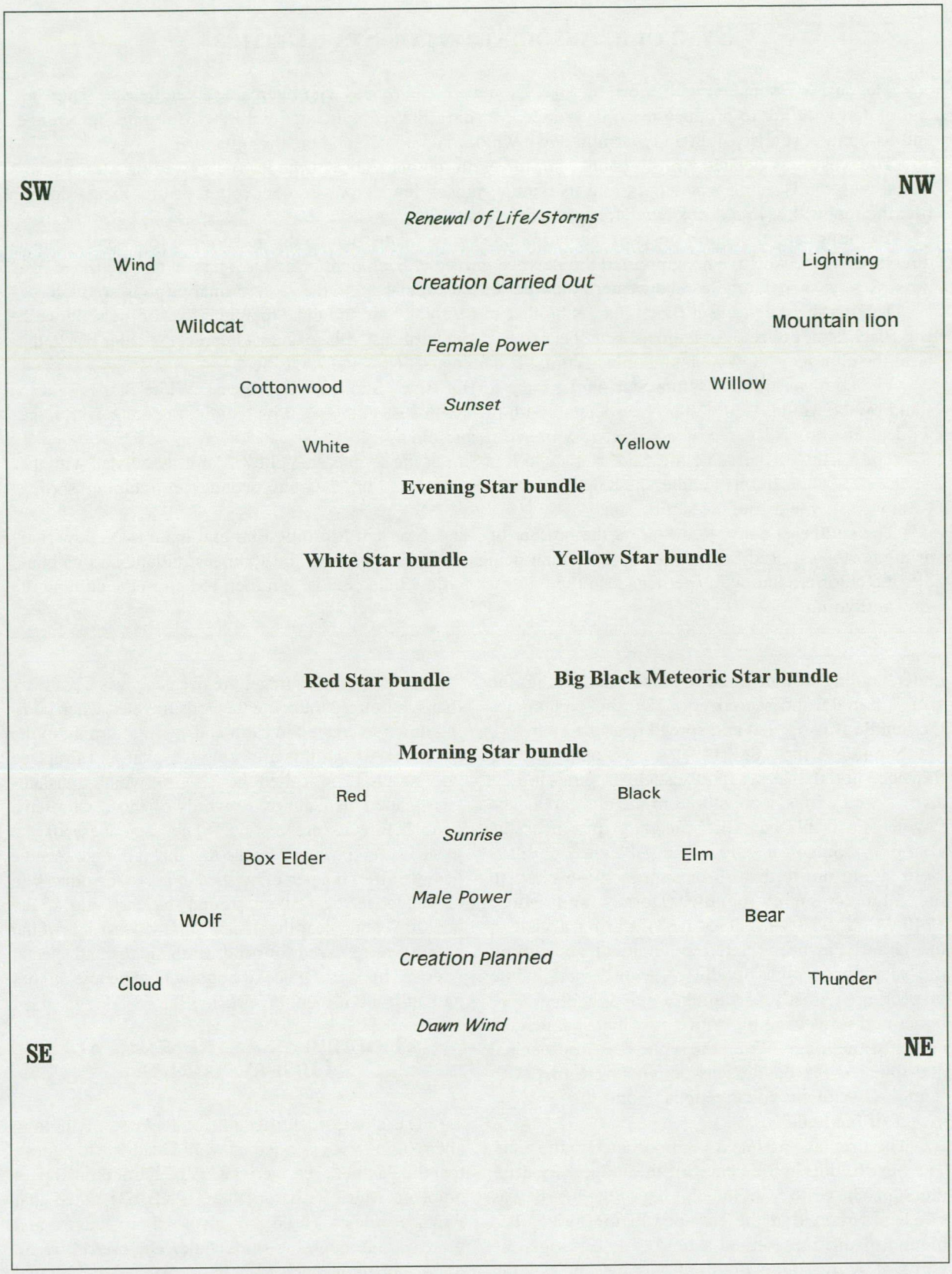


Figure 5. Symbolic associations for the four semicardinal directions, Morning Star, and Evening Star.

Symbolic Associations of Star Deities

The east is associated with Morning Star, the male creation god who overcame Evening Star's powers and mated with her to produce the human race. Morning Star is associated with the Morning Star village and its bundle, sunrise, light and warmth, dawn wind, male power, and creation planned.

The west is associated with Evening Star, the earth mother figure of the Pawnee. Evening Star is associated with the Evening Star village and its bundle, sunset, female power, conception of life, the garden of life, the renewal of life/storms, and creation carried out.

The four central support posts of the earthlodge symbolically denote the gods of the four semicardinal directions of the world, who supported the Pawnee universe. Each quarter god is a patron to the village that possesses its sacred bundle. The western quarter gods are female, and the eastern quarter gods are male.

The northeast deity, Big Black Star, is brother of Morning Star and mate to White Star of the southwest. Big Black Star, protector of animals, is associated with the northeast village and its bundle, the color black, the bear, the elm tree, thunder, autumn, black corn, the coming of night, and adult life.

The southwest deity, White Star, is the mate to Big Black Star of the northeast. White Star is said to stand by the Moon. White Star is associated with the southwest village and its bundle, the color white, the wildcat, the box elder tree, wind, winter, white corn, and old age.

The northwest deity, Yellow Star, is mate to Red Star of the southeast. Yellow Star is associated with the northwest village and its bundle, the color yellow, the mountain lion, the cottonwood tree, lightning, spring, yellow corn, youth, and the setting sun.

The southeast deity, Red Star, is the brother of Black Star and Morning Star and mate to Yellow Star of the northwest. Red Star, protector of human beings, is associated with the southeast village and its bundle, the color red, the wolf (perhaps also the wildcat), willow tree, clouds, summer, red corn, the coming of day, and youth.

understanding to men. Above the altar hung the sacred bundle and sacred corn. During ceremonies the bundle was opened and spread near the altar.

Samuel Allis (1887:143), a missionary to the Pawnee, noted that weapons, such as guns, bows, arrows, and whips, were stored in the altar area. The Pawnee hosts placed Allis' sleeping area near the altar — perhaps for safekeeping. Pawnee children were taught not to disturb or approach too close to the altar or sacred bundle (Dorsey and Murie 1940:94). J. T. Irving (1955:133), during a visit to the Grand Pawnee, related an incident concerning the sacredness of a bundle. A white man, while inspecting a host's earthlodge, spied a bundle of bones and skins hanging from a pole that spanned the center of the lodge. When the white man approached and touched the bundle, his actions were met with loud and violent vocalizations from the Pawnee owner of the bundle.

The fireplace was next in importance to the altar. The hearth, dug in the center of the lodge, stood for the Sun. The earth from the digging of the hearth was piled in a mound at the entrance of the lodge. The mound of dirt represented a fund of knowledge, the voice of *Tirawa*. The fireplace was his open mouth (Chamberlain 1982:157-158).

Between the altar and the fireplace was a pathway that symbolized the route the gods traveled when coming down to create the earth and when returning to the heavens. Also in this area between altar and fireplace was a sacred spot called the *wi-haru*, which translates "the place where the wise words of those who have gone before us are resting." The sacredness of the place was emphasized by the fact that it did not receive heavy traffic. If a person wished to get to the other side of the lodge, he walked around the east side of the hearth. Seating near the *wi-haru* on the west side of the hearth was reserved for heads of the lodge and special guests. This was a place of honor where people did not pass in front of them (Weltfish 1971:78).

Lodges as Astronomical Observatories

The strong identification of Pawnee mythology and religion with sky deities would lead one to believe that the Pawnee were very aware of astronomical phenomena. Murie (Chamberlain 1982:163) noted that Pawnee priests could sit inside their lodges and view stars through the smokehole. The priests, aware of sky phenomena, could have planned directional alignments for lodges that aided in astronomical

observations. A lodge built as an observatory would have an east-facing entryway with an unobstructed view (Chamberlain 1982:165). Morning sunlight would reach the altar on the west side for about 23 days during each equinox season: 7 days before and 16 days after the vernal equinox in March-April and 16 days before and 7 days after the autumnal equinox in September (Chamberlain 1982:171).

One Pawnee myth mentions the placement of a bison skull on the altar at the west side of the lodge, where the first rays of sunlight illuminated it (Dorsey 1906:15). Another source reports that the early morning light of Morning Star shone through the entryway upon the hearth, "rekindling" the fire. This symbolized the union of Morning Star with Evening Star and procreation (Weltfish 1971:78).

Observations of the heavens guided the timing of events in the Pawnee year. In June the Pawnee were gone on summer bison hunts. They returned to the village in late August to harvest their crops. The people left again in November for a winter bison hunt, returning in February to plant crops (Chamberlain 1982:172). Using this calendar of events, the Pawnee were present in their lodges during the equinoxes and were able to view the sunlight in the lodges.

> Perhaps the question is not whether the Skidi did or did not use lodges as equinox observatories, but rather whether they could have ignored such obvious and significant occurrences as the changing directions of the rising sun and the two times each year when the first rays of the sun could shine directly on the altar. The relationship between these times of year and other events would probably have been of paramount importance. The positions of the seven stars and the chiefs in council as seen through the smoke hole might have been the first clues of spring awakening (Chamberlain 1982:179).

Why the Pawnee divided the universe into quarters using the semicardinal directions is not clear. Most Native American groups used the cardinal directions and stressed solstice celebrations, based on the rising and setting of the sun. As described earlier, in Pawnee mythology the semicardinal directions were represented by stars that held up the sky and defined channels of entrance and exit for the moving bodies of the sky: Morning Star, Evening Star, Sun, and Moon (Chamberlain 1982:180). The semicardinal stars were represented in the central support posts of the Pawnee lodge and the northeast and northwest stars were again represented in the entryway posts. The ceiling of the earthlodge, a miniature of the universe, mirrored the night sky, and the passage of the inhabitants in and out of the earthlodge was marked like the passage of heavenly bodies. The seasonal positions and routes of the planets, as they passed through this sky passage, served the Pawnee as a calendar (Chamberlain 1982:181). The Pawnee used an intercalary or thirteenth month to adjust the calendar with astronomical observations. Among other names it was called the *Puhuweturukat*, which referred to the earthlodge entrance. The thirteenth month was squeezed between the other 12 months and was like an entryway to a lodge (Chamberlain 1982:181).

Lodge Identification

Inhabitants of the earthlodges were perhaps identified by items placed outside on the lodges. These items also could be ceremonial offerings. In May 1820 explorer Edwin James (1823) visited the Pawnee villages and gave the following account.

> At each of the villages, we observed small sticks of the length of eighteen inches or two feet, painted red, stuck in the earth in various situations, but chiefly on the roofs of the houses, each having the fragment of a human scalp, the hair of which streamed in the wind. Before the entrance to some of the lodges were small frames, like painters' easels, supporting each shield, and generally, a large painted, cylindrical case of skin, prepared like parchment, in which a war dress is deposited . . . .

On a second visit to the Pawnee during the summer of 1820, James (1823:427- 437) noted the exhibition of flags, weapons, and scalps on and around the lodges as an act of vanity on the part of the Pawnees and as a display for the whites. The sticks with scalp locks probably represented offering sticks, ceremonially set out by the Pawnee during the winter-summer transition ceremony, signaled by the first thunder of the spring. No references have been found to indicate that the Pawnee placed weapons or totems in front of lodges to indicate lodge ownership. Plains Indian groups were known to mark their residences by placing shields and weapons at the door. This also may be the case with the Pawnee.

Lodge Residency

The makeup of an earthlodge population was controlled by birth, marriage, and kinship ties.

Membership in a lodge was influenced by the matrilineal kinship and matrilocal residency patterns practiced by the Pawnee, but no set rules of residency existed. Neither were there rules defining the size of a lodge or its occupancy limits. Generally the population of a lodge was dense, compared to current American households, averaging 30 to 40 inhabitants. High-ranking individuals, such as chiefs or priests, had larger lodges.

Stable households did exist, but the kinship system allowed for movement of people from lodge to lodge. The inhabitants of an earthlodge could change from season to season after each hunting trek, as alliances were made and broken, and kinship bonds were strengthened or dissolved. A child could live with its grandmother in one lodge, its mother in another lodge, and its father in yet another lodge (Weltfish 1971:23). Ideally a man went to live with his wife in her parents' earthlodge. If an earthlodge became overcrowded, the eldest daughter and her husband moved out. Kin from each household helped to build one-half of a new lodge.

A historical account stated that a man with a number of wives, who lived in different lodges, moved from lodge to lodge (Allis 1887:147). If a man married the eldest daughter of a lodge, at that time it was planned whether or not he would marry the other sisters in the lodge at a later time (Lesser 1930:98-101). Often a young man married a woman who was already a member of a functioning lodge and went to live in that lodge. A young man who married an older woman — who was adept at managing a lodge — for his first marriage had the chance to take a younger wife later on. Likewise, a woman who married an older man could later take a younger husband. The marriage of a daughter was often confirmed or denied by the parent. If a man was too old or already had a number of wives, the parents might object to the marriage. In marriages where many gifts were exchanged, the marriage was considered permanent. Marriages that had few or no gifts were viewed as temporary at best.

A common marriage pattern among the Pawnee was that of two brothers marrying sisters and sharing an earthlodge. The husbands and wives were held in common, and similar forms of address were used between the couples. A younger brother might be sent to live with an older brother and his wife or wives. If one brother was away on a hunt or journey, another brother took care of his wife in his absence. If the brother died, the other brother was expected to marry the widow. A young man might also be sent to live in the lodge of his mother's brother. The uncle acted as a guardian out of obligation to his relationship to his sister, who provided for her brother whenever necessary. (A man always had a home with his mother or sister.) If the uncle died, the nephew married the widow (Lesser 1930:98-101).

Children had residency rights to an earthlodge household through their mother's lineage. Children had such rights along their father's line as well (Dorsey and Murie 1940:95). If a child was expelled from his parents' lodge, he could find shelter and food in his father's sister's house. Paternal aunts were noted for expressing lavish attention on their brother's children (Weltfish 1971:31).

Dorsey and Murie (1940:101) described a different form of residence in which the matrilocal residency was only practiced until the husband proved to his wife's parents that he was a competent provider and protector. When the husband left on his first raiding party, he put his wife and children in the care of his parents in their lodge. They stayed there after his return. A man built his own lodge if he reached a high status position, such as a warrior or priest, or if his father's lodge became overcrowded. When the earthlodge was completed, the husband constructed the altar on the west side or opposite the entryway; he and his wife together dug the central hearth.

Use of Lodge Space

The Pawnee viewed the earthlodge as an earthly replication of the universe, with the domed roof as the sky and the round walls as the horizon. The Pawnee called their universe *Kahuraru*, which translates as "the inside land" (Weltfish 1971:76). The earthlodge itself was tied symbolically to the sky cosmology from which the Pawnee originated and drew their life force. As discussed earlier, the major physical characteristics of the building with symbolic ties were the central support posts, the altar, the central hearth, the mound of dirt at the entrance, the entryway, and the eastern orientation of the entrance.

Women were considered the owners of an earthlodge and were responsible for its maintenance. Weltfish (1971:78) likened the household to a womb. The house and its women with their labor and production had reproductive power, not only in producing new family members but in sustaining the entire group with food production and preparation and with clothing. The prime adult women were responsible for the maintenance and furnishing of the lodge. The main role of the young females beyond household

chores was in bearing children and keeping able-bodied males around to supply the lodge with meat.

Although the females played the leading part in directing and carrying out the duties necessary for maintenance of the earthlodge, they were not dominant in the society. The men represented the lodge in its interaction with the rest of the village and the world (Weltfish 1971:78). The men also served as providers and protectors. They procured the meat and helped with the processing of it. They could assist in gardening, too. The men defended the lodge from enemies.

Women, the caretakers of the lodges, were rewarded supernaturally if their duties were fulfilled efficiently. Duties included keeping the lodge clean, corn offerings made to the bison skull on the altar, and the sacred bundle sweetened and cleaned. Rewards bestowed upon them were cosmic protections from such disruptive earthly elements as the evil of animals, raids from the enemies, disease, miscarriages, and stillbirths (Dorsey and Murie 1940:107). The behavior and actions of the women inside the lodge could affect happenings outside the lodge. If people were away on a hunt, those at home had to take precautions in order to ensure a successful hunt and the procurement of meat for the lodge. During this time menstruating women were not supposed to approach the altar because the bison might pick up the human scent and evade the hunters (Dorsey and Murie 1940:80). Other rituals involving menstruation and the house space were observed by the Pawnee. Until she was married, a young woman during her menstrual period was housed in a "little house" or "place-sitting-with-blood" with her grandmother with whom she ritually bathed (Dorsey and Murie 1940:95).

Head females of families sharing a lodge took turns cooking meals for the other inhabitants. The Pawnee viewed a man as stingy "who when it was his wife's turn to provide food for the occupants of the lodge, put on the fire a tiny pot of meat only sufficient for himself" (Dorsey and Murie 1940:108). A house with north and south families took turns preparing one of the two meals of a day. The top-ranking female was in charge of the preparation and was assisted by the younger and older females of her family. The food for the meal came from the food procured that day or from a cache the women of the family had prepared. Each woman had her own supply of dried vegetables and meat (Weltfish 1971:79-83).

Dorsey and Murie (1940:79) described the spatial arrangement of meals. Men and women ate separately, with the men seated in the west half of the lodge and the women near the hearth area. The children ate with the women. Weltfish (1971:79-83) gave a more detailed meal setting and serving arrangement. The seating of the family members around the hearth generally reflected the sleeping arrangement around the lodge's wall. The north family was seated on the north side, and the south family was seated on the south side. The men were seated on the west side of the hearth, sometimes accompanied by their senior wives. Other wives were seated next. The grandmothers and children sat to the east. Before the meal started, the cook made an offering to the altar, corn offered to the bison skull and meat offered to the ears of corn. Corn was never offered to corn, and meat was never offered to the bison skull. A white visitor reported that the Indians "often put much before the old skulls and say they eat it, when they know that the hungry dogs devour it" (Allis 1887:143). The woman who cooked the meal did the serving. The "guest" side was served first, with the men being served before the women and children. The cook served herself last. Conversations accompanied the meals, usually concerning the events of the day. The dishes were cleaned following the meal (Weltfish 1971:79-83).

The central support posts and the secondary support posts near the outer edge of the excavated floor were conspicuous reminders of the lodge construction and acted as a major element in the division and usage of space inside the earthlodge. At the center of the lodge under the smokehole was the central hearth, which served for cooking and heating and as a social center of the lodge. The hearth area was defined by the central support posts. The outer secondary support posts, which were spaced 3 m (10 ft) apart, defined the personal space areas for the inhabitants. These areas around the outer wall served as the sleeping quarters. The number of beds in a lodge varied from 2 to 18. These sleeping areas became quite elaborate, taking the form of frame platforms that were like raised bed frames. These were constructed with forked posts set in the ground and laid across with a supporting framework on which a bedding of grass and skins was placed. In some cases the beds were divided and partitioned, creating an enclosed private space for the user. Partitions were made of woven mats, skins, and/or cloth. Variations of the forms and uses of beds existed from lodge to lodge.

> In front of these apartments, either a partition of willow rods is erected or rush mats are hung up as curtains. But, this is not

always the case. In some lodges the simple platform alone is to be seen, without either partitions or curtains. In others there is not even the platform and the inmates sleep on the ground (Dunbar and Allis 1918:600).

Personal space in the lodge manifested itself in the form of sleeping areas. Age set, sex, and social ranking determined the definition and allotment of this personal space. In a single family dwelling the sleeping arrangements or personal spaces were arranged around the interior edges of the lodge. The children and young adults, including an elder daughter and her husband and children, had beds on the west side on either side of the altar. The father or parents slept on the center of the south side, with second or additional wives on the center of the north center side. The wife's or wives' parents had space on either side of the lodge door to the east (Lesser 1930:98-101). The doorway position may be viewed as symbolic of the outgoing status associated with old age and death, but older adults continued to hold directional positions in the household. In a double household, when brothers married sisters, the lodge was divided into north and south halves. Each family had one half and followed a pattern similar to that of the one-family lodge.

The arrangement of the women's sleeping quarters related to their age sets, stages of life, and their roles in the running of the earthlodge. The young women in their reproductive years were placed near the shrine of Evening Star, the fertility goddess. The sleeping area of the prime female was central along the wall between the altar and the entrance. The grandmothers slept near the doorway. Although symbolically on their way out, they maintained an important role in child rearing and food and goods production.

Activity and storage areas were established in and around the lodge. Firewood was stored inside on either side of the entryway. Small sweat lodges were also placed near the doorway. Platforms along the walls between beds were used for food storage. Corn mortars of hollowed logs were kept inside the lodge. In cases where a lodge was to be used in a ceremony, the entire lodge might be cleared of furnishings in order to have more space (Weltfish 1971:116). The use of interior cache pits may have been discontinued in later historic times or simply not included in the ethnographic record. However, ethnographic accounts report that cache pits for the long-term storage of foodstuffs, like dried vegetables and dried meat, were dug outside and near the earthlodge (Wedel 1936:52).

Historical Accounts

Historical accounts of Pawnee daily life in the earthlodge villages were recorded in 1833 by J. T. Irving, who visited the Pawnee with Commissioner Ellsworth during treaty negotiations. Irving (1955:130) provided a description of the Grand Pawnee village:

> It is situated in the open prairie at the foot of a long range of hills, and within 50 yards of the Platte . . . the lodges are numerous and stand close together, without the least regard of regularity . . . as we entered the village, the tops of the lodges were completely covered with women and children.

Irving (1955:162) described daily life in a Pawnee earthlodge, where he observed a dozen Indians "lounging" around the central hearth.

> Some reclining with their backs against the pillars supporting the roof, with their eyes half closed, were smoking their stone pipes. Some were lying half asleep upon the clay floor, with their feet within a few inches of the fire; and others were keeping up a sleepy song.
>
> At a short distance from the fire, half a dozen squaws were pounding corn in large mortars, and chattering vociferously at the same time. In the farther part of the building, about a dozen naked children, with faces almost hid by their bushy tangled hair, were rolling and wrestling upon the floor, occasionally causing the lodge to echo to their childish glee. In the background we could perceive some half a dozen shaggy, thievish looking wolf-dogs, skulking among the hides and bundles, in search of food, and gliding about with the air of dogs, who knew that they had no business there.

Irving (1955:135) reported the use of beds as personal space. He observed a young woman during the day retreating to a bed platform and dropping the grass matting in front for privacy.

While visiting the Pawnee, the white company were invited into many of the lodges to feast. Irving (1955:164) noted the varying degrees of hospitality and domestic life.

> Our receptions were different according to the dispositions of our hosts. Some were stern and solemn in their demeanor, and others as social able, and even lively as the whites. In some of the lodges, the females were of an acid temper, and to these our presence was not as agreeable as we could have wished.

Influence of Class on Lodge Size and Orientation

The Pawnee had a class system within each village that was reinforced by their religious beliefs. Medicine bundles of the Pawnee came in two forms: personal and tribal. Tribal bundles, which had life-renewing and sustaining properties, represented the people and were used to control production and social relations of villages (Holder 1974:42-50). Families that owned tribal bundles claimed the stars as ancestors and passed the bundles down through patrilineal descent, allowing them to be used to benefit the people. The title of "bundle holder" was the chief rank in the Pawnee society. The bundles were cared for by the chief and his wife. Knowledge of the bundles and manipulation of their contents were in the control of the priest class. Priests were assisted by their wives, and power was passed on by apprenticeship. The chief and priest families were endogamous, preventing the bundles from leaving the tribe. The leader families with religion-sanctioned control over the commoners were able to funnel goods upward to themselves for redistribution. The commoners allowed the leaders to have redistribution powers in exchange for the benefits of the life-perpetuating medicine bundles (Holder 1974:46-65).

Commoner families composed the central population and carried out the major food production and defense of the village. Commoners could rise in rank by gaining curing knowledge from the animal lodge societies and becoming doctors. Doctors who mastered all of the lodges became members of the Doctors Leader Lodge. Doctors had only earthly animal powers that were no match or challenge to the celestial powers of the chiefs and priest. A symbolic dualism was represented by the earthly doctors and the chiefs/priests sky figures. The chiefs and priests represented the creation powers of life, reproduction, crops, and perpetuation of the village, while the earthly doctors with their animal powers were connected with death and destruction and knew only methods of curing that held off death (Holder 1974:49-52).

The question of whether class ranking had an effect on the size, symbolic layout, and ownership of a lodge is unclear. Was a large house associated with wealth and power or with a large family that needed adequate shelter? Ownership and control of a lodge came in part from the ranking of the individual and the economics of the family group. In Pawnee society high-status families were considered deserving of greater quantities of the best-quality goods. A chief bundle holder needed a larger lodge in order to host ceremonies and to entertain. Thus, a larger house might be a sign of rank among the Pawnee.

On the other hand a successful family, whether leader or commoner, might have more wives and children, thus requiring a bigger lodge. The information gathered suggests that a man might have a lodge if he successfully gained rank by proving himself a good provider and warrior. In Pawnee society acquired rank by performance was second to the inherited or apprenticed rank held by the leader families. Murie (1981a:11) noted that commoners who were socially unmotivated or unsuccessful had small, poorly furnished lodges and were the receivers of charity from the upper class.

The acquisition of a lodge also might be due to overcrowding in a lodge. The new lodge was viewed as a colony of the former, being built and populated by members of the parent lodge who had proven themselves capable of running a household, such as the eldest daughter or son and her/his family. Constructing a new lodge or repairing an existing one was labor intensive and required resources of material and labor. The labor came through kinship lines and reciprocity. For example, a wife's family would help in building one half, and the husband's family would help in building the other half (Weltfish 1971:107-114).

Directional orientation of the lodge also might be an indicator of the inhabitants' status. Individuals of rank linked with ceremonies, such as priests, might have their lodges built as proscribed by the symbolism of the religion. As discussed earlier, lodges used as observatories to determine seasons and timing of ceremonial events had entryways oriented to the east.

Conclusion

Four areas of space usage among the Pawnee earthlodge were observed. The construction and use of the structure symbolically presented the religious cosmology, and specific areas of the house had symbolic relationships to the belief system and reinforced religious ideals. The space within the house was controlled by social patterns of matrilocal residence and matrilineal kinship that defined the lodge's members. Space usage was defined on personal and individual levels, with sex and age sets having specific space and duties associated with the house. Finally, the physical size and directional orientation of the lodge was influenced by the rank and status a family had in the village.

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Previously Unreported Archeological Sites in Smoky Hill Township, McPherson County, Kansas

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The purpose of this study was to discover, describe, and map archeological sites in McPherson County. The author conducted the field work during the summer of 1988, when he was a part-time student at McPherson College in McPherson, Kansas. He completed this paper to fulfill the requirements of an Archeology Field Study class, instructed by Mrs. Catherine Goldsmith.

During the summer of 1988, the author spent more than 35 hours walking a 1-square-mile area on the north and south sides of the Smoky Hill River in search of previously unknown or unreported prehistoric American Indian (Amerindian) habitation or other type sites. The search was conducted primarily in one section of the Smoky Hill Township southwest of the town of Lindsborg in the north-central portion of McPherson County, Kansas (Figure 1).

Methods

All landowners or land tenants were contacted, and permission was granted for examination of the fields. All owners or tenants were told that the artifacts found in the course of this time would be given to them after the report was done and that they would receive a copy of the report of findings regarding the Amerindian sites found on their lands.

The primary reports of the new sites were written on Archeological Site Forms, developed by the Kansas State Historical Society. These forms include information such as exact location, names of owner and tenant, major drainage, area of site, type of soil, material collected and observed, elevation, and approach to the site, as well as other data. The information recorded on these forms was used in making this report.

Many days were spent in search of the different sites. The survey area was arbitrarily divided into five areas: Area 1 is the southeast quarter of the section, Area 2 is the southwest quarter, Area 3 is the northwest quarter, Area 4 is the northeast quarter, and Area 5 is the south quarter of the southwest quarter and the southeast quarter of the adjoining section. Some areas contained one or more sites, while others were completely sterile of any artifacts. When artifacts were found, they were just a sampling of artifacts native to that area. The author devised the following phrases to describe the relative abundance of artifacts in the areas examined: sterile — completely devoid of Amerindian artifacts, light scattering — 1 artifact approximately every 5.5 m (18 ft), moderate scattering — 3 to 6 artifacts approximately every 5.5 m (18 ft), heavy concentration/scattering — 7 or more artifacts every 5.5 m (18 ft).

Area 1

Area 1 includes three habitation sites on the south side of the Smoky Hill River and west of a creek. This land falls in the Lancaster-Hedville-Otalgia soil association, which is moderately deep and shallow, moderately sloping with well-drained and somewhat excessively drained soils. The soils are Roxbury silty clay loam and Bridgeport silt loam. The habitation sites sit on relatively level ground but slope toward the east, draining into the creek.

Site 1 (14MP413) is located along the south edge of the ridge at the 1350-ft elevation. The approximate size is 46 m (50 yards) east and west by 14 m (15 yards) north and south. Here was a light to moderate scattering of artifacts, mostly broken shells with some chert chips and sandstone fragments, but no pottery.

Site 2 (14MP405) is located on a small rise on a finger pointing east toward the creek. Five cord-roughened potsherds and a chipped Dakota sandstone celt were found. The area had a very light scattering of artifacts, and all that were seen were collected. The area involved is approximately 14 m (15 yards) in diameter.

Site 3 (14MP415) is located approximately 91 m (100 yards) to the northwest of Site 2. A ridge maintaining the level of the field, which is to the west, juts approximately 46 m (50 yards) toward the creek and then gently slopes north, south, and east. Upon this high ground was a moderate scattering of artifacts.

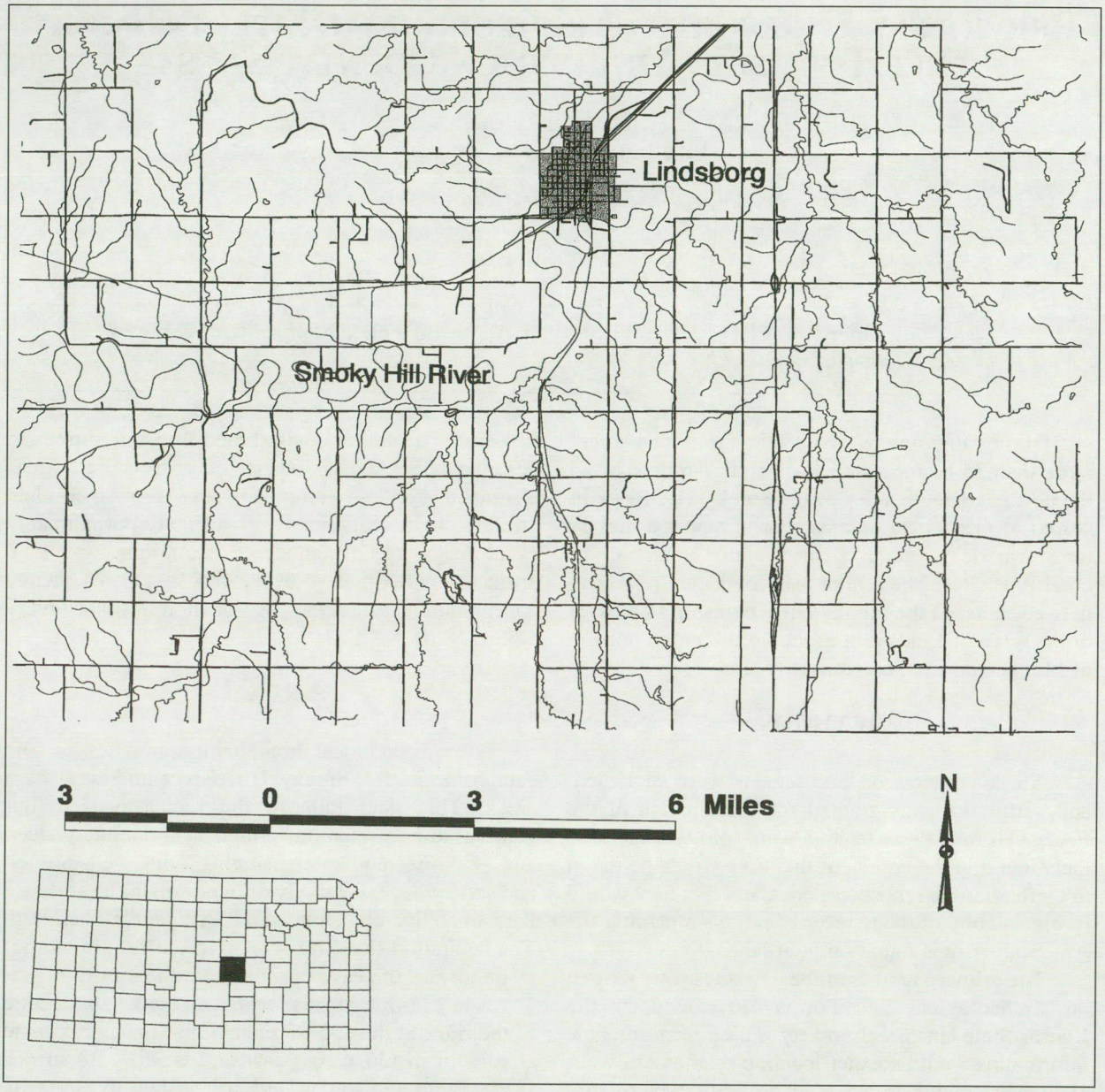


Figure 1. Map of north-central McPherson County.

Cord-roughened pottery, shell fragments, hammerstones with thumb notches, chert chips, and pieces of sandstone of varying sizes were collected. The approximate size of this site is 27 m (30 yards) north and south by 46 m (50 yards) east and west.

North of Site 3 is a gently sloping flood plain to the river, approximately 91 to 137 m (100 to 150 yards) away. This area was sterile of artifacts.

Area 1 also has five sites on the east side of the creek. The soil association is the same as that on the west side of the creek, and there are two soil types. The Longford silty clay loam, which is on the 2 to 6 percent slopes and erodes easily, covers the low land next to the creek. The Smolan silty clay loam, with 1 to 3 percent slopes, is on the high ground east of the creek.

Site 4 (14MP416) is located on top of a small knoll. Artifacts observed were small pieces of sandstone and limestone and a small scraper, which was collected.

Site 5 (14MP417) is approximately 91 m (80 yards) north of Site 4. This site lies at the south end of a ridge

that runs to the northeast. The only artifacts found were a piece of petrified wood and a gray chert chip.

Site 6 (14MP414) is approximately 183 m (200 yards) to the northwest on the top of a hill that is about 27 m (30 yards) wide by 55 m (60 yards) long. This hill rises out of the low area along the east side of the creek, and the soil color is different from the soil around it. The top of the hill is somewhat flat with moderately sloping sides in all directions. On top of the hill a light scattering of artifacts was observed, not all of which were collected. Specimens collected were two heat-treated cores, one piece of banded purple chert, a gray chert chip, a white chert chip, the black end of a gray medium-size scraper, one crude gray scraper, one smoothed celt, one small hammerstone, a piece of red paint rock, and a piece of quartzite.

Site 7 is situated approximately 91 m (100 yards) east of Site 6 on the edge of the northeast-trending ridge. The site is located just above the 1350-foot elevation at the westernmost point. Nothing was collected from the light scattering of artifacts there.

Site 8 (14MP418) is located approximately 137 to 183 m (150 to 200 yards) northwest of Site 7 on the top of the highest hill in the area. The site is approximately 46 m (50 yards) in diameter. On top of the hill and outward is a light to moderate scattering of artifacts, including a large brown quartzite tool with cortex on one side, two crude flint knives, a small crude hand ax, three small gray chert chips, three light gray chert chips, three reddish chert chips, a small brown quartz chip, and one small piece of shell.

The field conditions were good the day the field was searched. Surprisingly no pottery was found on this side of the creek. (There was pottery just across the creek to the west.) Because of this and the crude artifacts that were found, a date of Early Ceramic to Early Middle Ceramic was estimated.

All of the sites on the east side are on high ground. The area would easily support a small group of people. The creek is spring fed and probably ran all of the time, providing water for man and animal. The nearby Smoky Hill River also supplied water for human inhabitants, as well as animals and the plants that grew along the edges. Prehistoric people who lived in this area were hunter/gatherers and incipient farmers. They gathered what grew along the river and creeks. Bison was their main food source, but they hunted other animals as well. Clam shells are seen in just about every site, indicating that they harvested fresh-water clams, which can still be found in the river. They undoubtedly ate fish, too. The pottery shows the need for storage.

Area 2

Area 2, the southwest quarter section, is bounded by county roads on the south and west, by large electrical towers on the east, and by a farm trail on the north. The Smoky Hill River just touches the northeast edge of the southwest quarter, as it runs to the east into the next quarter section. In the northwest quarter of this quarter section is a ridge at the 1350-ft elevation that runs southwest to northeast. Area 2 is in the Hord-Tobin-Bridgeport soil association, which is nearly level, moderately to well-drained soils that have silty subsoils found on flood plains and terraces. The soil type is Roxbury silty clay loam.

Site 1 (14MP302), approximately 91 by 23 m (100 by 25 yards) in size, is on the northwest side of the ridge south of the trail, and Site 2 (14MP412), approximately 91 by 32 m (100 by 35 yards) in size, is northeast of the trail. These sites sit on the northwest edge of the ridge and continue toward the northwest approximately halfway down the slope. At the time of the survey, a summer soybean crop covered the southwest edge of this ridge. The author suspects that the sites continue into that field and across the road to the west.

On these sites a light scattering of artifacts was found, including a chert core, a broken beveled knife of gray chert, a crude knife of brown flint, several broken thumb scrapers, gray chert chips in an assortment of sizes, sandstone, bone and burned bone, shell, and cord-roughened pottery sherds (Figure 2). After spending much time trying to identify the pottery, the author concluded that it is very similar to the Riley Cord-Roughened type found at the Whiteford site (14SA1) near Salina. This village and burial pit site has been classified within the Smoky Hill aspect.

A sufficient number of artifacts was collected from these sites to consider the collection as an assemblage, representative of the people who lived here during the Middle Ceramic period, A.D. 900 to 1500. O'Brien (1984:59) stated, "These communities were placed either on terraces overlooking the rivers and creeks or on the bluffs overlooking these drainages."

The water in the Smoky Hill River attracted large amounts of game and supported various types of plants along its banks. The people of this time and area harvested the plants, ate fish and fresh-water clams, and hunted bison and other game. Some crops were grown on the silt bottoms of the flood plains.

The south half of this quarter section was sterile of any Amerindian artifacts. Caliche is found in some areas.

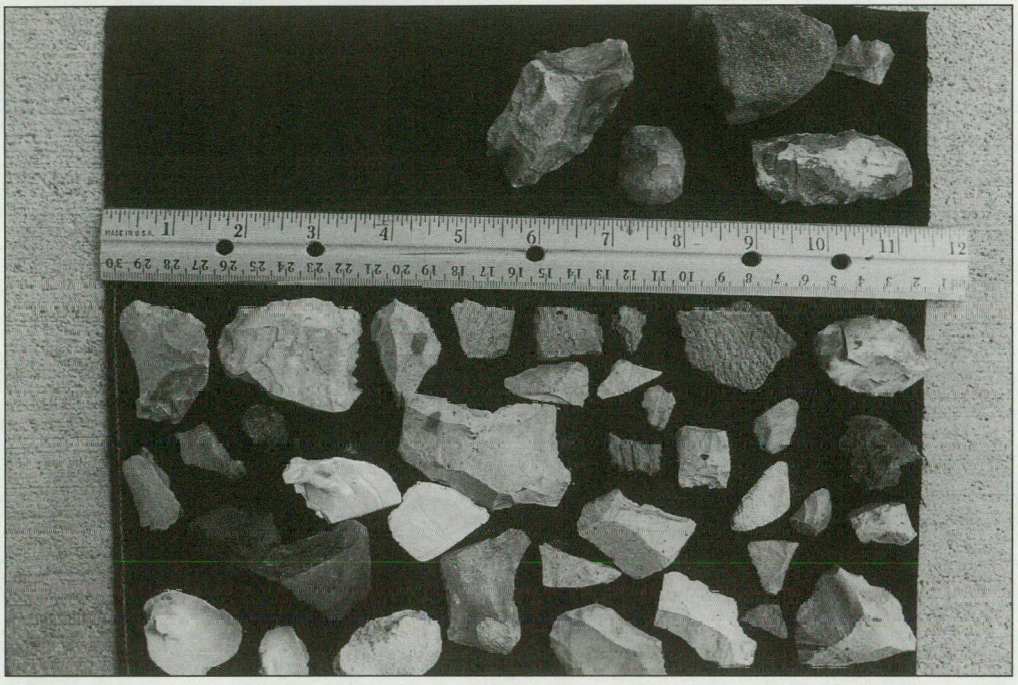


Figure 2. Artifacts from Area 2, Site 2 (14MP412).

Area 3

Area 3 is the northwest quarter of the section, bordered on the north and west by county roads, on the east by electric lines, and on the south by an imaginary section line north of the farm trail. The Smoky Hill River enters this section from the west, near the middle of the west boarder. The river runs northeast .2 km (1/8 mile), then makes a large curve to the south, going directly south into the southwest quarter of the section.

This area, including flood plains and terraces, is entirely in the Hord-Tobin-Bridgeport association of soils, which consists of nearly level, well-drained to moderately well-drained soils that have silty subsoils. Those subsoils are Bridgeport, Roxbury, and McCook types.

The southwest (south of the river) and southeast quarters of the area were sterile of artifacts. The northwest quarter of the area had two summer crops on it at the time of the survey and could not be searched.

On the northeast quarter of Area 3, two small sites (14MP419) are located. Site 1 is at the 1345-ft elevation line along the southeast edge of a south-to-northeast-trending terrace that runs toward the trees along an old oxbow of the river. From the oxbow, Site 1 is approximately 229 m (250 yards) to the southwest. The approximate size of the site is 23 m (25 yards) in diameter.

A light scattering of artifacts was found on top of the terrace and on the slope to the south: bone fragments, some burned bone, several pieces of sandstone, assorted sizes of gray chert chips, one small triangular projectile point of pink chert, and one large hand-held knife of gray chert with a white shell fossil embedded on its ventral side. No pottery was observed or collected from this area.

On the east side of the old oxbow sit three structures of an old farm. Brick and steel artifacts were common in this area.

Site 2 sits approximately 37 m (40 yards) southwest of Site 1 and is approximately 23 m (25 yards) in diameter. Artifacts collected here consisted of six small pieces of bone, four small pieces of burned bone, a piece of gray chert, two pieces of sandstone, and a sherd of cord-roughened pottery.

Area 3 was well searched twice, once after a 3-inch rain. The two sites (14MP419) yielded only a partial assemblage, making it difficult to determine an age and cultural time period. Because of the one piece of cord-roughened pottery, the author estimates a Middle Ceramic period occupation. No other sites were found in Area 3, but the northwest quarter should be searched after the crops are harvested.

The resources of this area provided greatly for earlier man's survival. The river and creek provided

water, and trees on the banks supplied shade, wood for house construction, fuel for fires, and nuts for food. Along the river numerous plants grew that provided food or served other purposes. Animals watered at the river and creeks, where they could be easily ambushed from thickets. Fish and clams abounded in the streams. When the river flooded, it brought in silty soil, which was easy to dig up and plant crops for one season. The river once may have flowed next to these two sites and covered up or swept away other associated sites, or these sites could be all that is exposed of a much larger and yet undiscovered site.

Area 4

Area 4 is the northeast quarter of the section. The Smoky Hill River enters the area from the south near the southwest corner, goes north approximately .2 km (1/8 mile), turns east, and wanders east-northeast into the next section to the east. Beginning in the middle of this quarter section, on the north side of the river, is an old oxbow of the river that runs to the northwest and extends into the section to the north. This area is bounded on the north, south, and east by section lines and on the west by electrical power lines.

This area is divided into four parcels by the river and the oxbow. The parcels south of the river, north of the river, and west of the oxbow were sterile. The large old island, created by the oxbow, also was sterile. These plots were surveyed after a 3-inch rain, when ground conditions were excellent. The land north of the river and east of the oxbow was mostly covered by corn at the time of the survey.

Site 1 (14MP420) is located along the east side of the oxbow on a small knoll that can be seen looking to the south from the road. When looking at this area from the north, the setting is reminiscent of the Forsburg site (14SA420) southeast of Salina. A light scattering of artifacts was collected, including bone fragments, one small piece of shell, one small piece of cord-roughened pottery, and one gray chert tool. Although the site was searched after the substantial rain, this was all that could be found. The potsherd and the chert tool were similar to artifacts found in the other survey areas, and the author classified the site as Middle Ceramic in age. The site may continue to the north along the old oxbow, but the corn crop prevented looking over this field, which should be searched when possible.

This area is similar to all the others. The water from the rivers and streams attracted animals and man to its shores. These Amerindians were hunter-gatherers who subsidized their food supply with early farming. Bison was the primary meat source and also met other needs (tools, clothing, etc.). Fresh-water clams, smaller animals, and plants completed the food selection.

Area 5

Area 5 encompasses the lower portions of the southwest and southeast quarters of the section that lies north of Areas 1 through 4. Essentially there is one continuous site for approximately 1.3 km (.8 mile). On the west a farm sits on a hill that is well above the level of the surrounding countryside. A ridge or terrace runs northeast from the farm into what appears to be a very old stream scar. Continuing east, this oxbow bends southeast, where it intersects an oxbow of newer age. The terrace here extends to a point, sharply turns northeast for 46 to 55 m (50 to 60 yards), then straightens and wanders east for almost a quarter-mile through the neighboring farm and into the next section to the east. The top or edge of this terrace is at the1345-ft elevation. Trees divide the sections, going south from where the road turns west. Because of a milo crop on the land east of the trees, it could not be searched. In the southeast quarter of the southwest quarter, two summer crops prevented survey of that field.

On the terrace west of the crops, there is a spot where an old farmstead was located. No buildings remain, but pieces of brick and concrete foundations were evident. There were also a lot of steel artifacts, such as old sickle sections and an ax head, old buttons, broken glass, plates, crockery jars, etc. The metal artifacts from the old farm site were mixed with artifacts from the Amerindian site.

Hereafter the sites will be described in order of geographic location from west to east, but they were numbered according to the order of discovery. Site 18 (14MP424) follows the terrace from the farm on the west to the edge of the crops on the east. There was a light scattering of artifacts all along this terrace without a definite break. Artifacts collected included bone fragments, some clam shells, sandstone, limestone, chert chips, broken chert tools, and cord-roughened pottery sherds. Evidence that this site continues through the crop areas was found at the power line tower, where a knife and several cord-roughened potsherds were collected.

Following the edge of the terrace east toward the road lie Sites 2 through 7 (collectively 14MP422). The artifacts were along the tops of the terrace and on the slope running to the south in the old oxbow. Some sites contained only a few artifacts, but there were definite breaks between the localities. On the west,

artifact frequency was a light scattering, gradually becoming a moderate scattering on the east side by the road. Artifacts included assorted sizes of knives, a Middle Ceramic gray chert projectile point, heat-treated chert, a lot of gray chert, sandstone, Middle Ceramic potsherds, and clam shells (Figure 3).

Sites 8 and 9 (collectively 14MP423) are located just across the road to the east of Site 2, continuing along the terrace to the second farm. Site 8 is approximately 37 m (40 yards) in diameter, and Site 9 is approximately 32 m (35 yards) in diameter. A light to moderate scattering of artifacts consisted of gray chert chips, pieces of sandstone and limestone, a large amount of clam shells (many of which were unbroken), and some bone (including possible bear toes) on the east near the west edge of the farm (Figure 4). Cord-roughened pottery sherds, similar to those found in all other areas, also were found. The author is convinced that other sites are located on the farm.

Sites 10 through 17 (collectively 14MP411) are more distinct localities, separated by sterile areas. This complex of sites covers an area approximately 183 m (200 yards) long by about 27 m (30 yards) wide. Again, the light-to-moderate scattering of artifacts is located on the top of the terrace and down the slope to the south. Along the east and near the trees, there were 2, 15- to 39-cm (6- to 12-in) areas where artifacts were clumped together. One such concentration included three pieces of cord-roughened pottery, a banded chert knife, a sandstone shaft smoother fragment, three pieces of limestone, a piece of sandstone, and a piece of clam shell (Figure 5). Other artifacts from Sites 10 through 17 included clam shells, pieces of bone, gray and heat-treated chert chips and tools, two gray scrapers, and cord-roughened pottery sherds similar to those at other sites mentioned in this report (Figures 6 and 7).

Site 1 (14MP421) was once on the island inside of an old oxbow. About 1 m (3 ft) below the edge of the terrace, bones were found, many of which showed butchering marks. This site was visited twice, and both times only bones were found, leading the author to believe that it was a butchering site.

Area 5 is similar to all others, and its sites represent occupation during the Middle Ceramic period. The resources of this area attracted early man and animals. The river and creeks provided water, trees, and other plant life necessary for food, shelter, warmth, and protection. Animals were drawn to the water, where man could easily attack. The river and creeks also provided fish and clams, which were part of the food supply. The silty soils of the flood plains were easily farmed.

Summary

In *Archeology in Kansas* Dr. Patricia J. O'Brien (1984:59) described the Central Plains Village Farmers from the Middle Ceramic period as follows.

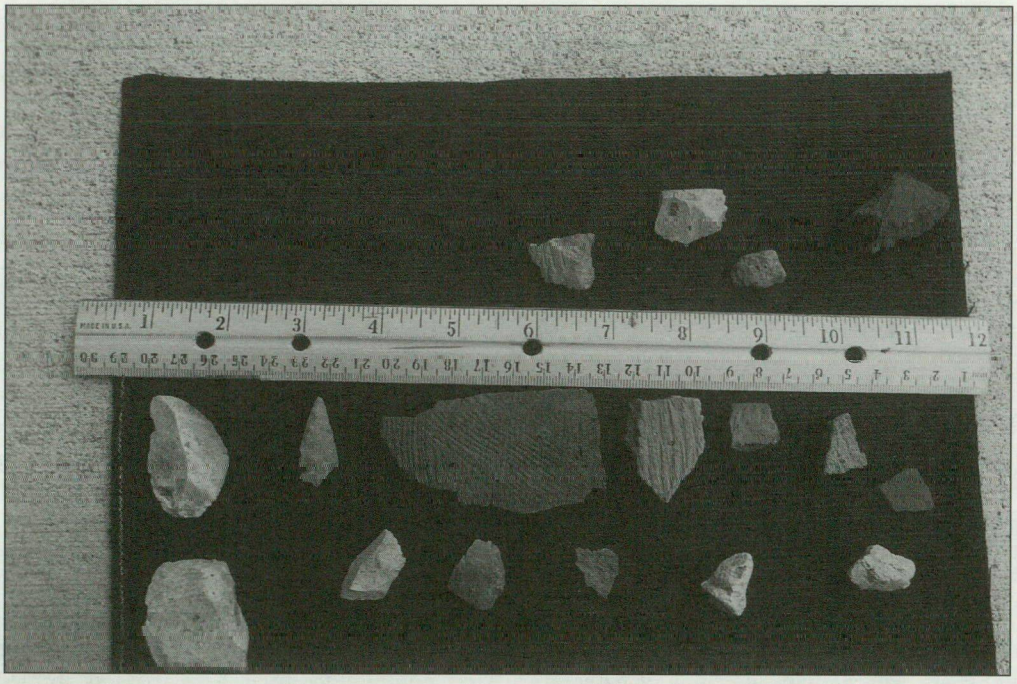


Figure 3. Artifacts from Area 5, Site 5 (part of 14MP422).

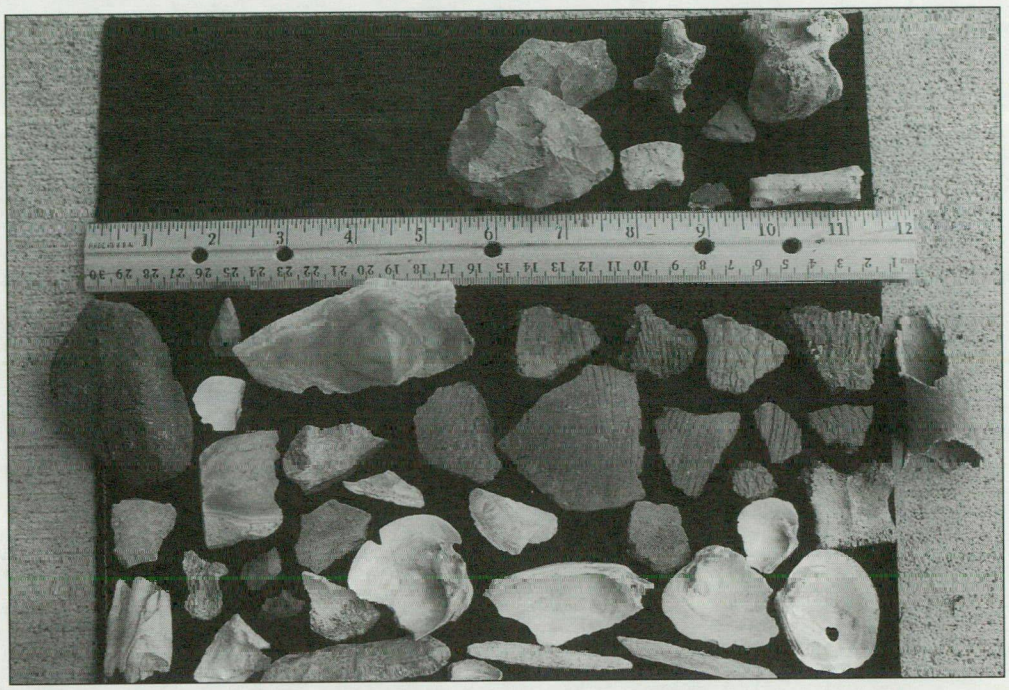


Figure 4. Artifacts from Area 5, Site 8 (part of 14MP423).

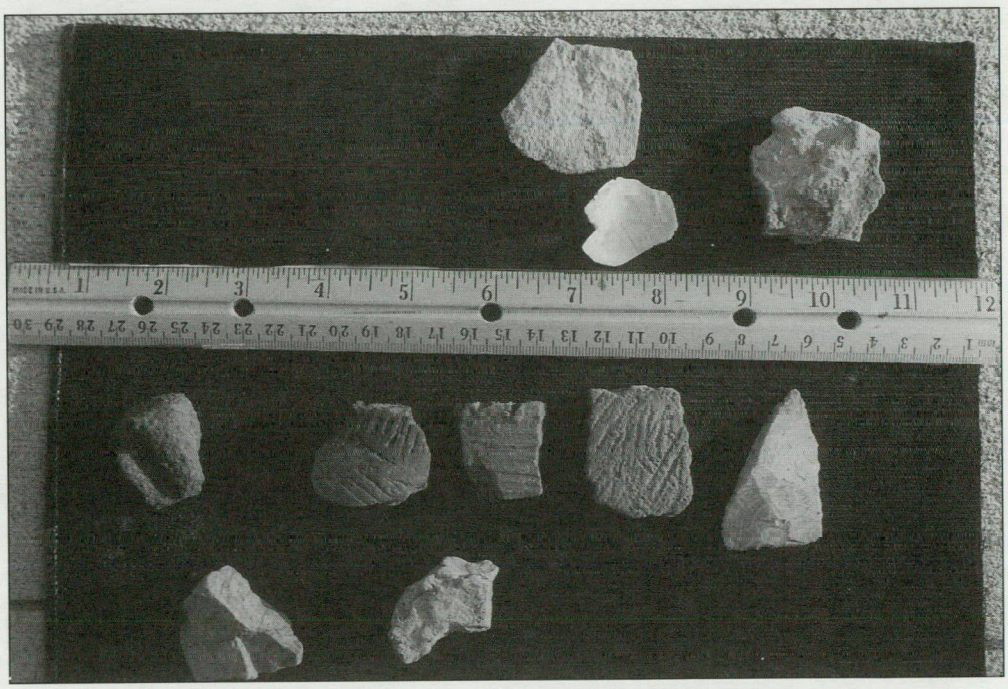


Figure 5. Artifacts from Area 5, Site 16 (part of 14MP411).

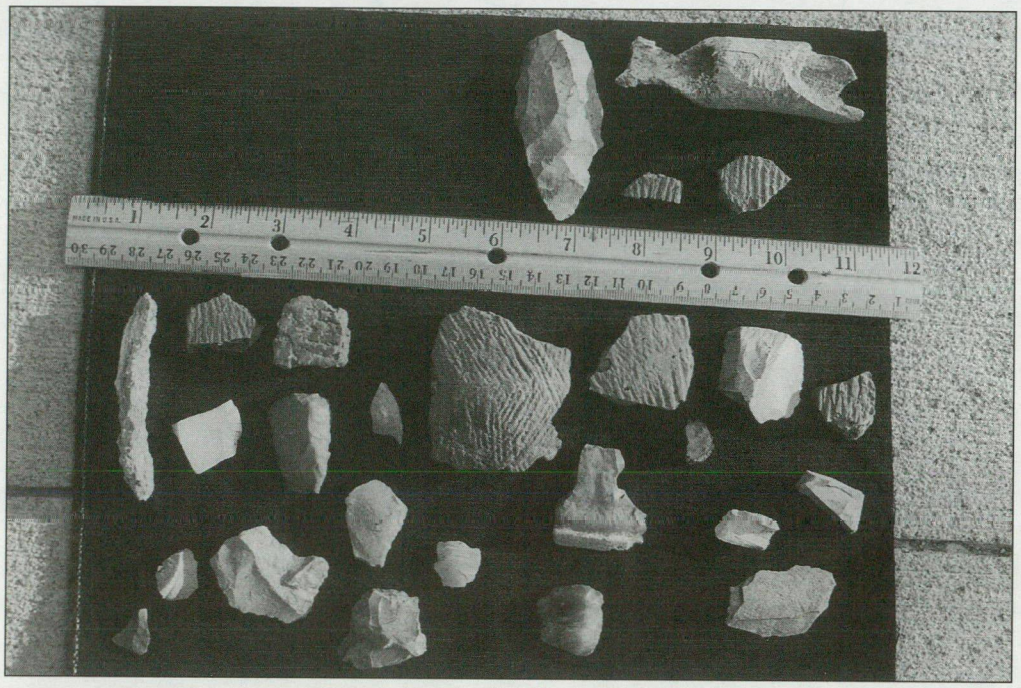


Figure 6. Artifacts from Area 5, Site 15 (part of 14MP411).

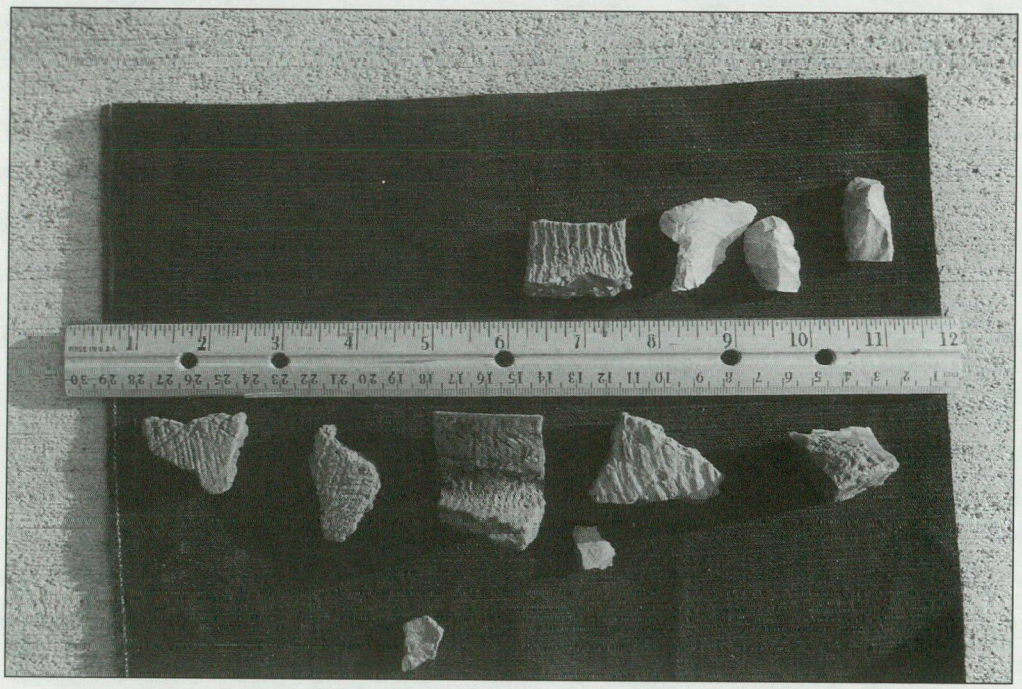


Figure 7. Artifacts from Area 5, Site 17 (part of 14MP411).

The most widespread and important of the archeological remains of Kansas Central Plains Village farmers are the Upper Republican, Nebraska and Smoky Hill complexes. These three complexes make up what is called the Central Plains tradition and are reflective of a common lifestyle . . . . The complexes are identified and separated from each other more by geographic location and specific types of pottery, than by any other criteria. These complexes date between A.D. 900-1500 . . . .

The settlement pattern, as it is known to date, consisted of either isolated earth lodges strung along a drainage and separated from each other by a distance of about half a mile. Or consist of small clusters of lodges (3 or 4 lodges each) that may be separated by several miles. Or consist occasionally of 20 or more lodges that would be gathered into a village. This pattern could be called one of the isolated "farmsteads," "small hamlets" and "small villages." These communities were placed either on terraces overlooking the rivers and creeks or on the bluffs overlooking those drainages.

The following factors lead the author to conclude that the sites recorded during this survey represent the Central Plains Village from the Central Plains tradition of the Middle Ceramic period, dating from A.D. 900 to 1500.

1. Geographic location: All of the sites in this study are located on terraces overlooking the river or the creeks (i.e., Area 1, Sites 1-5; Area 2, Sites 1 and 2; Area 3, Sites 1 and 2; Area 4, Site 1; Area 5, Sites 1-18) or on the bluffs overlooking these drainages (i.e., Area 1, Sites 6-8). These sites are along or near the Smoky Hill River or used to be along the river.
2. Specific types of pottery: All pottery found was cord-roughened and tempered with sand or shell, which are characteristics of Smoky Hill aspect pottery (O'Brien 1984:121).

Acknowledgments. The author wishes to thank the landowners along the Smoky Hill River in McPherson County, who allowed him to conduct the survey.

Reference Cited

O'Brien, Patricia J.
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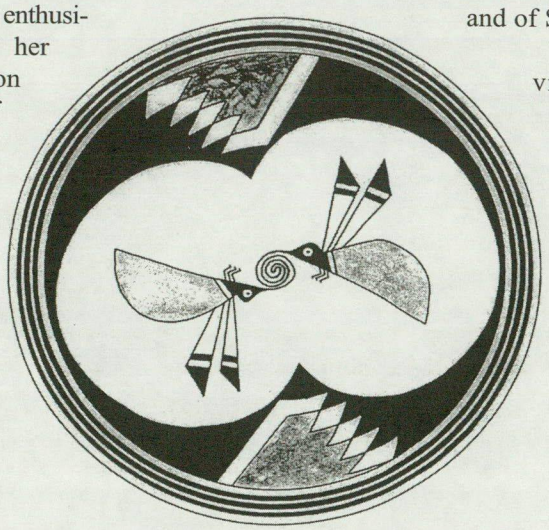
Book Reviews

Treasured Earth: Hattie Cosgrove's Mimbres Archaeology in the American Southwest. CAROLYN O'BAGY DAVIS with foreword by RICHARD B. WOODBURY. 1995. Sanpete Publications and Old Pueblo Archaeology Center, Tucson, Arizona. 216 pp., illustrations, map, 210 vintage photographs, more than 400 Mimbres bowl drawings. $24.95 (paper). ISBN: 0-9635092-1-7. *Reviewed by* Marlin F. Hawley.

Born into a well-connected family in Atchison, Kansas, in 1877, Harriet Silliman Cosgrove's avocational interest in archeology took her from her upper-class hardware-store heiress upbringing into the harsh, out-of-the-way back country of the desert Southwest, coastal Georgia, and the lush jungles of Guatemala. In the process she shared the stage with some of the luminaries of twentieth-century archeology: Alfred V. Kidder, Walter Hough, Emil Haury, J. O. Brew, Earl Morris, Richard Woodbury, and many others. Curiously, in a profession little used to women, Hattie made her mark, earning the respect of all who came to know her and appreciate her hard work, diligence, integrity, and passionate interest in the human past. Her artistic talents alone would have been enough to secure her reputation but Hattie was more than just an artist; she was first and foremost an archeologist.

Hattie was not alone in her archeological endeavors, sharing her enthusiasm for archeology with her husband, Cornelius Burton "Burt" Cosgrove. A native of Santa Fe, Burt Cosgrove relocated with his half-sister and mother to Atchison in 1889, when he was 14 years old. As a teenager, he collected artifacts from the Pensoneau Trading Post site in the Stranger Creek valley, as well as from other sites in the area. (Some of the artifacts from the former site later were donated to the Kansas State Historical Society, though they seem to have disappeared over the years.) Burt earned a degree in law from the University of Nebraska in Lincoln in 1899. He and Hattie were married in 1901, the beginning "of the happiest and most complete partnership," as A. V. Kidder once observed (p. 118). In 1907 the couple moved to Sliver City, New Mexico, where Burton ran a hardware store.

The Gila River wilderness, a veritable storehouse of archeological sites, proved sufficiently alluring. Burton and Hattie soon were searching out sites — and not just any sites either, as the Gila River was formerly part of the Mimbres culture area. The Mimbres, now regarded as part of the Mogollon phase, dated from circa A.D. 600 to 1150, with the classic Mimbres period from about A.D. 1000 to 1150 (Cordell 1984). Mimbres pueblos, filled with artifacts, often concealed burials beneath room floors. With the burials were entombed examples of some of the finest ceramics ever made, decorated with animals, fish, birds, people, genre scenes, and geometric designs. These bowls, ritually "killed," carefully were placed over the heads of the deceased, symbolically representing the dome of the sky. Unfortunately, the bowls, so fraught with cosmological meaning to their deceased makers, were the impetus to treasure seekers and pothunters. The Mimbres area was and continues to be heavily looted. Witness to this depredation, the Cosgroves realized that the evidence of a culture was vanishing before them; this realization changed the course of their lives and of Southwestern archeology.



One of Hattie Cosgrove's drawings of a Mimbres bowl design from the Eisele Collection, reproduced from page 155 of *Treasured Earth.*

Seeking out like-minded individuals, the Cosgroves joined the Santa Fe Archaeological Society in 1916. The Cosgroves began to excavate their first sites in 1917 but soon realized that, no matter how well-intentioned their efforts, they needed improvement. That same year they set out to visit as many professionally run excavations as they could. These visits were not made out of idle curiosity. The Cosgroves determined that if they were to salvage sites, they first would have to learn how to do so in a scientific manner. Over the next few years,

they visited sites such as Hawikuh and Pecos. The work at Hawikuh was under the direction of Walter Hough. Visits to Pecos, being excavated by the brilliant archeologist Alfred V. Kidder, followed. At Pecos the Cosgroves formed an immediate and lasting friendship with Alfred and his wife, Madeline.

The Cosgroves purchased two acres of a Mimbres site, promptly dubbed Treasure Hill, and began exploration, learning as they dug. (The site is one of a few still preserved.) By 1923 Burt had published a paper on the work in *El Palacio*, a newsletter/journal published by the Archaeological Society of New Mexico, the School of American Research, the Laboratory of Anthropology, and the Museum of New Mexico. Kidder (1924) cited the paper the following year in his classic *An Introduction to the Study of Southwestern Archaeology*. Their meticulous work brought a unique reward. Burt was offered a position with the Peabody Museum at Harvard. Shortly thereafter, Hattie also joined the staff. By 1924 Burt and Hattie had introduced Wesley Bradfield, an archeologist with the School of American Research, and other scholars to the Mimbres. However, the Cosgroves realized that they needed to excavate other sites to broaden their understanding of the Mimbres. Swarts Ruin was the chosen site, and there they spent five seasons. Their report, written in the off-seasons in their basement lab at the Peabody, was published by the Peabody in 1932. Along with Bradfield's report on his Cosgrove-inspired work at Cameron Creek, the report put Mimbres on the board. Kidder (1957) eventually would dub Burt and Hattie "Mr. and Mrs. Mimbres" for their efforts.

The Cosgroves did not stay idle. Concurrent with the work at Swarts and the analysis and write-up in Massachusetts, the Cosgroves explored caves in the Hueco Mountains of west Texas, sites in western Oklahoma, and in 1929 participated in excavations at Stallings Island off the Georgia coast. Only the Great Depression, during which funds dwindled, slowed their work. Even Kidder, who was not only a brilliant archeologist but a skilled administrator, found his ability to solicit funding inadequate to keep crews out in the field. The Cosgroves had relied, as did most everyone else, on private donations for their work. There is no greater testament to their passion for archeology than the fact that, because the Peabody could offer them little even when times were flush, Burt and Hattie lived on their own funds. Further proof of their dedication comes from the fact that much of their work was undertaken while both were in their 50s. Through heat, freezing cold, insects, dust, and sand, the Cosgroves cheerfully endured.

The 1933 season found the Cosgroves at Pendleton Ruin with the Kidders. The joint excavation was Kidder's last venture into Southwestern archeology, as he soon shifted his attention to Central America. The excavation was a failure, in terms of the paucity of artifacts. Kidder developed health problems and ultimately left the Cosgroves to complete the work. Years later, after Burt's death, Kidder and Hattie wrote up the site for publication.

Despite the Great Depression, which entailed too much time out of the field and away from the Southwest, the early 1930s were good years for Burt and Hattie. In 1935 they joined Jo Brew's interdisciplinary team at Awatovi, the site of a 1629 Fransican mission to the Hopi. In 1680 the Hopi and other tribes rebelled and forced the Spanish from the area. Twelve years later the Spanish returned to Awatovi, but it was only a few years before the Hopi murdered the priests and destroyed the mission. Burt and Hattie, then into their 60s, were the oldest crew members. Davis portrays the Awatovi excavations, which lasted five seasons, as the halcyon days of Southwestern archeology. This is perhaps true; the investigations stand as fine example of interdisciplinary research, drawing upon the skills of archeologists, ceramicists, geologists, architects, and other specialists (Brew 1994). The crew included some names familiar to Plains archeologists — E. Mott Davis and Richard Wheeler — as well as a good many Hopi.

Tragically for Hattie and Burt the end was near. Toward the end of the second season at Awatovi, Burt complained of stomach pains and was transported to a hospital. When recovery seemed imminent, Hattie returned to the work of cleaning, sorting, cataloguing, and reconstructing vessels. A Navaho runner soon brought word that Burt had suffered a fatal heart attack while in the hospital. Donald Scott, the director of the Peabody, arranged for shipment of Burt's body to Atchison, where he was laid to rest.

Following the funeral, Hattie resumed her work at Awatovi and, over the seasons spent there, washed, sorted, and catalogued nearly half a million sherds. She was instrumental in keeping the camp running smoothly and keeping personal frictions to a minimum. When excavations took an unexpected turn with the discovery of an intact, sand-filled kiva under the altar, the work had to continue into the winter. Hattie and a small crew stayed on, awakening to frost and frozen pails of water. Despite the cold, Hattie insisted on working closely with Watson Smith on the careful recording of the many layers of murals on the kiva walls.

In the years after Burt's sudden death, Hattie continued with her archeological pursuits, attending the

Pecos Conference when possible. (She and Burt had attended the first one in 1927.) She traveled to Guatemala at Kidder's request on two occasions and ventured forth into the field, though on short forays, as late as 1954, when she accompanied Frank Hibben to Pottery Mound. Her participation there was impressive considering that, after breaking both her legs and an arm in 1951, her doctor told her that she would never walk again. In 1958 she was awarded an honorary doctorate from the University of New Mexico. She was 80 years old. Hattie Cosgrove died on July 7, 1970, a few days before her 94th birthday. Her life took many turns — from Atchison, Kansas, hardware heiress to respected archeologist — but Hattie once remarked that she would gladly live it all over again.

Treasured Earth is a warm and fitting tribute to the Cosgroves. Davis sometimes waxes nostalgic but confronts head-on the underrated role of women in archeology and the ambivalence and not infrequent disdain of the professional for the amateur (or avocational, as some prefer). Women have long distinguished themselves in anthropology, despite some lingering misguided Victorian perceptions that women were too high-strung for education and too delicate for the field. Hattie was not the first to prove this notion false (cf. Cordell 1993; Peacock and Parezo 1988; Reyman 1992). In regard to their non-academic entry into archeology, Burton and Hattie seem to have been spared the worst of the denigration too often ladled out by the academic and professional community. Gifted contemporaries, such as Al Lancaster, were not so lucky. At Awatovi, Peabody Museum Director Donald Scott refused to allow Jo Brew to bestow the title of "assistant director" upon Lancaster. Brew eventually prevailed, but the forces of professionalization continued to cleave the discipline. As Elizabeth Dumont (1976) once observed: "[i]f 'amateur' had retained its original denotation i.e., 'one who loves' the term would cut the body of practicing archeologists at radically different joints than does the current usage." For the Cosgroves and so many others, this statement rings especially true. In later years aspersions were cast upon their work; blessedly, though, more thoughtful modern reappraisals of their efforts have countered some of these attitudes (cf. Cordell 1993; LeBlanc 1983).

Davis has enhanced her text through the addition of more than 200 photographs (some of which could have been made larger), most made available by Burton Cosgrove, Jr., and the reproduced text of correspondence, recipes, and a generous sample of Hattie's drawings of Mimbres design motifs. Altogether these latter number more than 400, most of which are grouped in the back of the book. The photographs are not keyed to the text, forming at times almost a separate "text." The recipes include some of Hattie's perennial camp favorites for such dishes as Texas hash and watermelon pickles, though not included is the recipe for Hattie's famous blue corn enchiladas about which Kidder (1957) raved. The text, although well written, is occasionally repetitive, and some included details seem irrelevant. The book could also profit from an index. Its flaws are minor, however, and in the end *Treasured Earth* is a book to read and savor by professional and amateur alike.

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Neanderthal: A Novel. JOHN DARNTON. 1996. Thorndike Press, Thorndike, Maine. 366 pp. $24.00 (cloth). ISBN 0-679-44978-7. 1997. St. Martin's Paperbacks, New York. 395 pp. $7.99 (mass market). ISBN 0-312-96300-9. *Reviewed by* Angie Paquette

Do you REALLY know how we evolved? Imagine, if you can, what it would be like to find out one day that everything you ever knew or believed about human history and prehistory, anthropology, archeology — about human existence as we know it — was wrong. Enter the world of humanity and its evolution through the mind of John Darnton. Via Darnton's imagination, you arrive at *Neanderthal: A Novel*. The book was published in 1996 by Random House and became a New York Times Best Seller.

The story contains many puzzle pieces. One of the main pieces is the Khodzant Enigma, a tablet found in Tajikistan (part of former Russia, located on the western border of China) by a peasant in 1874. It was transported to Khodzant (also spelled Khojent, Khudzhand, and Khodzhant, and formerly known as Leninabad) and later taken to the National Museum of Antiquities and Artifacts in Dushanbe in the Khanate of Bukhara. The tablet was rectangular in shape and intricately carved. It told of a long-ago battle fought between two very different groups of people — one gentle and one violent. The story could never be fully understood, however, because the portion that contained the ending was missing. Hence the name Khodzant Enigma.

Another puzzle piece involves three people. A renowned archeologist sends a mysterious message to two of his proteges and then disappears. He was last seen in the Pamirs, a mountain range on the border between former Russia and China, one of the most unexplored areas of the world. The scientists decide to go looking for him and find instead the adventure of their lives. They discover a power once known and used by humans that has long since been forgotten.

What should be changed about human society? Should humans have more or fewer inhibitions? Should lifestyles be more "primitive"? Is it ethical to correct a "flaw" in a primitive society to improve its chances for survival, longevity, and even prosperity? Are there any abilities that humans used to have that were lost through evolution? These are a few of the questions — or other puzzle pieces — explored in *Neanderthal: A Novel*.

While it has historical and practical flaws and a premise that can't be proven, this story is wildly imaginative. It also gives one the ability to look at the world, its inhabitants, and their cultures through different perspectives. It then makes it possible to apply those perspectives to modern humanity by exploring where strengths and weaknesses and capacities for good and evil originate.

This story is interesting because it questions which ethical standards should be required for anthropologists and archeologists. If a scientist learns something about human evolutionary development that could have profound effects on how the past, present, and future are interpreted, the results should be published and made available to society — right? What if that information dictates the survival of a race of people?

Neanderthal: A Novel is thought-provoking, intriguing, and entertaining. Even though it is a popular work of fiction, it would be good reading for KAA members who want to explore new ideas about who human beings are and how they got here. It gives a more anthropological than archeological perspective. A person who thinks he or she has already thought about all the possible ways humans may have evolved into who they are today ought to read this book. It holds interest for anyone who has contemplated the evolutionary process and how many "branches" grow on the human family tree.

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Jim Gunnerson received B.S. and M.A. degrees from the University of Nebraska (1949, 1950) and his Ph.D. from Harvard in 1963. His primary research interests have been late prehistoric and protohistoric archeology in Nebraska, Kansas, New Mexico, Colorado, and Utah. In 1974 he returned to the University of Nebraska as Museum Director and is now Professor Emeritus.

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Angie is a member of the KAA. She is the webmaster of several websites. She enjoys learning about and participating in all types of archeological and paleontological excavation.

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John is a native of Logan County, Kansas, and currently resides in Lawrence. He holds B.S. and M.A. degrees from the University of Kansas. Retired from the U.S. government, John devotes much of his energy to archeology and history and has published scholarly papers in both areas. He is a member of the KAA.

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Fred is a Special Projects Archeologist for the Kansas State Historical Society. For the past four years he has worked on the infamous Arkansas City project.

Doug Taylor
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Formerly a KAA member, Doug worked on certification in the surveying category. He located many sites along the Smoky Hill River. Before leaving Kansas, he donated some of his artifact collection to the Kansas State Historical Society. He and his wife, Robin, now live in Farmington, New Mexico.

Daryl Walters
[redacted]

Daryl is a member of the KAA and the local Shawnee Chapter. He has worked on several Kansas State Historical Society crews and has been a regular volunteer in the artifact lab in Topeka. Prior to the Clinton Lake project, he served as a volunteer cultural resources investigator for the U.S. Army Corps of Engineers office at Perry Lake.

Waldo R. Wedel

Waldo R. Wedel was a native of North Newton, Kansas. He died at age 87 on August 27, 1996, in Boulder, Colorado. At the time of his death, he was Archeologist Emeritus in the Department of Anthropology at the Smithsonian Institution's U.S. National Museum. To quote from the obituary by David M. Gradwohl in *Plains Anthropologist* 41(158):317-332: "Wedel's publications, spanning six decades, helped define and shape research in Plains prehistory, both in descriptive and theoretical terms. Among his stellar research accomplishments were the definition of specific archaeological manifestations, the establishment of chronologies in Plains prehistory, the linkage of archaeological complexes to historically known Plains Indian tribes, the study of prehistoric Plains settlement patterns, the exploration of migration and trade systems between the Plains and the Southwest, the analysis of specific artifact categories in functional as well as culture-historical terms, the investigation of astronomical knowledge achieved by Plains Indians, and discussions of the history of Plains anthropology. Perhaps, above all, Wedel is especially renowned for his incisive research on the ecology of the Great Plains and its influences on human activities through time."

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