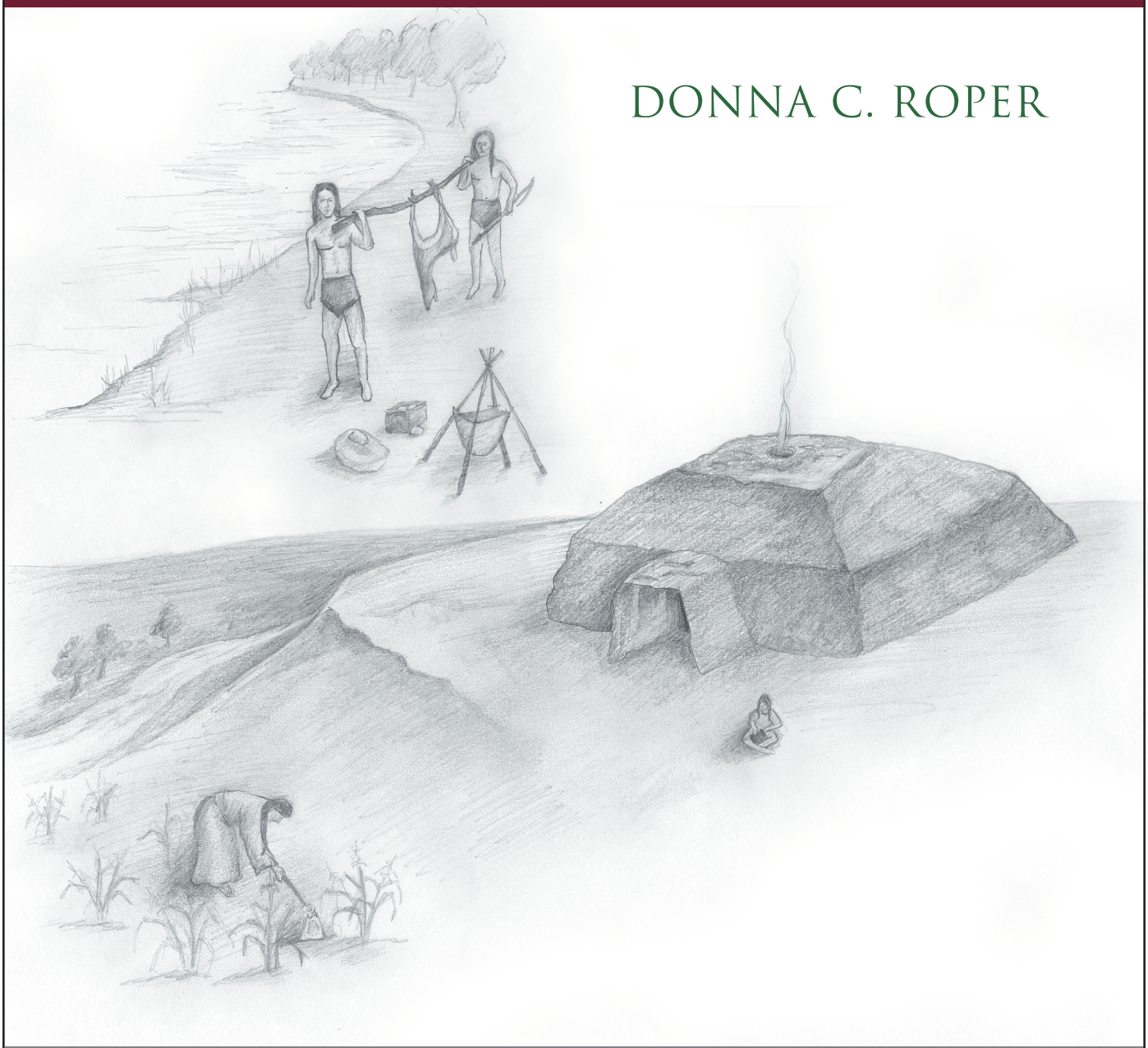
THE Archaeology of Central Kansas:

Based on the Reed Collections from Archaeological Sites in Saline and Ottawa Counties

DONNA C. ROPER



Bulletin of the Kansas Anthropological Association No. 3

The Archaeology of Central Kansas

Based on the Reed Collections
from Archaeological Sites in
Saline and Ottawa Counties

Here on the vast open prairie land,
May the gentle evening breezes always sing so grand.
When I have joined the redman beneath the sod,
May my children & their children find this prairie their favorite place to trod.



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Based on the Reed Collections from Archaeological Sites in Saline and Ottawa Counties

By Donna C. Roper

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Preface

Were a detailed history of Kansas archaeology to be written, one of its themes surely would be the important role avocational archaeologists have played in recording and investigating the state's archeological record. Alfred Johnson (2006:vii–ix) highlighted this same observation in his Foreword to a recent synthesis of Kansas archaeology and while it might not be obvious to readers who are unfamiliar with the names of those who have investigated the archaeological record in Kansas, the various chapters in that same volume extensively drew on work by avocationals conducted over many decades and throughout the state. Numerous other studies of Kansas archaeology also either make use of information collected by avocationals or are devoted solely to analyzing materials so collected. This study joins that list.

Saline and Ottawa counties in central Kansas are cut by the lower reaches of three major rivers that, one after another, join to form the Kansas River. Flowing through bedrock formations that are not highly resistant to erosion, these streams have created broad, fertile, well-watered valleys that hold abundant resources important to people in the past as well as in the present. Not surprisingly, they also contain a rich and extensive archaeological record, with late prehistoric remains particularly well attested. Perhaps because the valleys are so broad and the bordering bluffs not very high, the area was left alone during the major dam-and-reservoir building efforts of the mid-twentieth century. What this meant for the area's archaeological sites was that they remained accessible for study, but rarely received priority as the relatively small number of professionals in the state focused on other places and sites that needed attention before being inundated or otherwise destroyed by construction. The bitter irony, though, is that since the sites remained accessible, they also remained vulnerable to adverse effects from continued cultivation. This is understandable in light of the region's rural character and rich agricultural lands, but it also has diminished the archaeological record to the point of near-obliteration (Latham 2006a). Some important cultural developments occurred in the region. That we will ever know much about them is because of the dedicated work of a succession of local avocational archaeologists.

One of these individuals is Harold Reed (Figure 0.1). Reed was born and lived almost his entire life in Salina. In the mid-1960s, at which time he was in his early 30s, Reed became acquainted with members of the Kansas Anthropological Association (KAA) and with then-State Archeologist Thomas A. Witty, Jr. He began collecting around this time and also began participating in KAA activities. These activities lasted until his death in 2005 at the age of 69. During the nearly four decades of his work, he filed original site forms for 85 sites in 12 counties, including 45 sites in Saline County and 3 sites in Ottawa County, and collected materials from several previously-recorded sites (Figure 0.2). With the frequent assistance of his wife, Margie, or one of his daughters (Figure 0.3), his collections were meticulously cataloged and all field and catalog records were systematically organized. As a whole, these collections comprise an important data set for documenting the culture history of a unique geographic setting in central Kansas. To realize their potential, however, they need systematic analysis and publication.

In early 2005, the Reeds asked me to undertake an analysis of the collections, particularly those from the late prehistoric, so-called Smoky Hill phase, sites. At that point, I had recently completed the review draft of my study of the Smoky Hill phase Indian Burial Pit (Roper 2006a); had previously described the excavations at several Smoky Hill phase sites in Saline and Ottawa counties that had been conducted by Guy and Mabel Whiteford, the Reeds' predecessors in central Kansas (Roper 2001; Chapter 2 of this study); written a study of the Whitefords' archaeological career in Kansas (Roper 2003); and described the Reeds' excavation

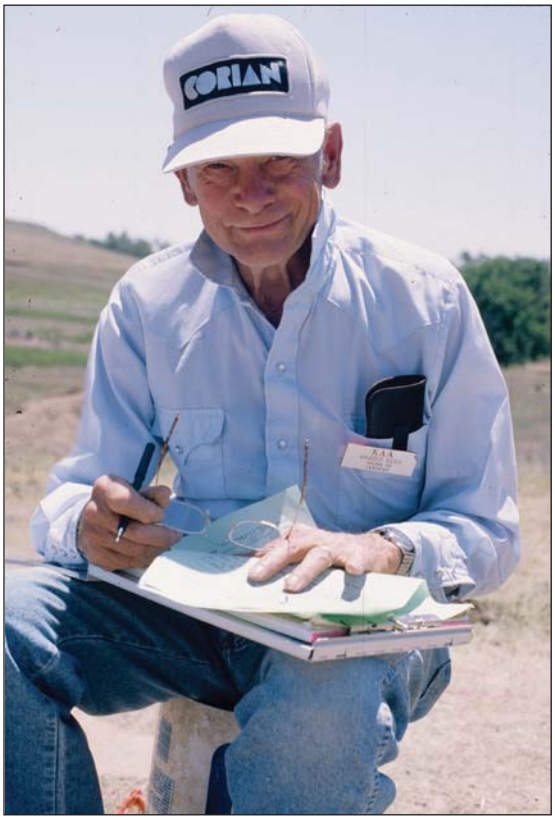


Figure 0.1. Harold Reed at the Albert Bell Site, June 2002

of 14SA415, a Smoky Hill phase site (Roper and Reed 2003). Following some encouraging pilot studies (Roper 2005a, 2006b, 2007a, 2007b), I also was planning additional work with the pottery held in museum collections from Smoky Hill phase sites in the area. Not surprisingly, I readily jumped at the chance to work with this excellent and informative collection. It has taken longer than any of us hoped and envisioned, for a multitude of reasons. In this interval, however, I completed an article (Roper 2006c) reviewing Smoky Hill phase settlement patterns for inclusion in a volume of *The Kansas Anthropologist* in memory of Harold. That study was based on the collections considered in greater detail here. In a timely development, in mid-2008, I and a collaborator were awarded a major research grant from the National Science Foundation (NSF) to conduct the envisioned study of museum collections of Smoky Hill phase pottery. That grant became effective in the fall of 2008. It and the study of Reed Collection analysis became a natural pairing and, as they have progressed, each has informed the other. Harold had asked me several times if these collections could help the ceramic study he knew I was planning and I always told him they could. Although

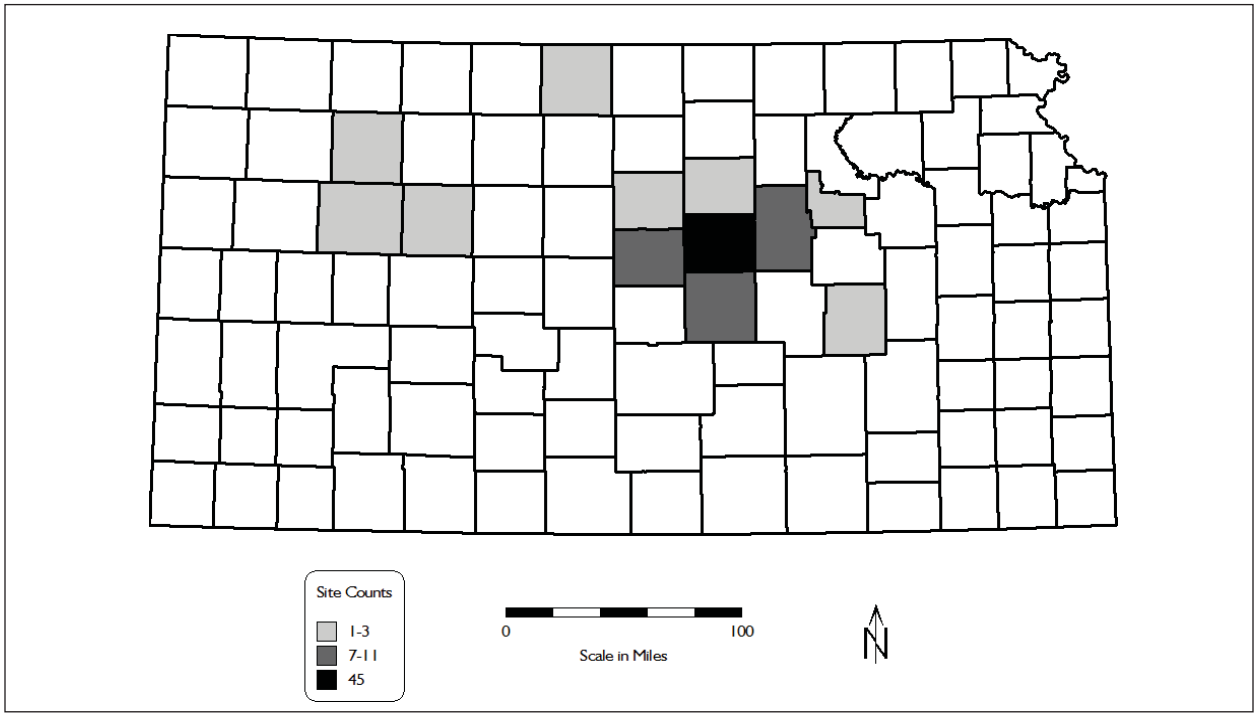


Figure 0.2. Distribution within Kansas, by County, of Sites Recorded by the Reeds



Figure 0.3. Reed Family Camping at Scott County State Park, 1975

much of that will be published elsewhere, some information from that study is reflected in this book.

A second result of the ceramics study is a new and large series of radiocarbon age determinations for the Smoky Hill phase and, to a lesser extent, a broader part of the Central Plains tradition of which the Smoky Hill phase is but one part (Roper and Adair 2011, 2012; Roper 2012, 2014). Although the radiocarbon dating effort did not use materials from the Reed Collection, the results have enhanced the study of the collection since certain developments in the overall Salina locality now can be placed more precisely in time and need not be merely assigned to a broad interval of time. That study actually is far more than a mere accumulation of more radiocarbon dates, and extends to a critical analysis of all dates, using a systematic process of weeding out inaccurate and misleading dates. Detailed elsewhere (Roper 2014), the pertinent parts of that chronology study are summarized in a later chapter of this book and provide a part of the timeline against which we can evaluate the historical processes operating in late prehistoric central/north-central Kansas.

One of the desires the Reeds expressed is that this book be for the amateur archaeologist, as is surely appropriate for an account based on collections made by amateurs. This demands a somewhat different approach to writing than does a book directed to a professional audience or perhaps even a general audience of individuals who are interested but do not necessarily identify themselves as amateur archaeologists. Writing for an amateur (or general) audience, however, must not be license to suspend proper thinking and eliminate the use of archaeological theory. A line that I like comes from Brian Fagan's book *Writing Archaeology*, where he says that "Writing archaeology for a general audience requires storytelling, not the just-so stories rightly castigated by legions of archaeologists, but compelling narratives *based on the best scientific data available*" (Fagan 2006:15; italics added). Fagan opened that discussion with an example of how a Belgian archaeologist evaluated a pile of 9000-year old debitage and concluded the knapper was left-handed. The archaeologist did not just draw these conclusions from thin air to enliven a story, but from a detailed use-wear analysis demonstrating that there was no other way certain results could have been obtained. That is always the crux: it is not sufficient simply to show that a result *could* be obtained in a certain way, but it is necessary to show it *could* ***not*** *have been obtained any other way* (see my further discussion of this in Roper 2008a).

I also do not believe that writing archaeology for a general audience should be accomplished by distorting the story to avoid hard words and concepts. Talking down to the reader is mistakenly thinking that unfamiliarity with terms and concepts reflects an inability or unwillingness to learn them. Obviously, a deliberately obfuscatory writing style is not appropriate (many professionals do not like it either); better, in my mind, is to use a concept or term and explain it clearly and concisely, showing why the harder language better expresses what the author is saying. This, then, is how I have tried to write this book. I hope that, if at times it challenges amateur archaeologists, that they will take that challenge, for the answer will always be there somewhere.

I hope too, by the way, that professional archaeologists will find useful information here. I am, after all, writing about a part of Kansas that has a rich archaeological record and that reflects considerable cultural dynamism—much more than I realized when I began this. There are lessons here that we can use elsewhere. In fact, I see implications here

that demand a new synthesis of the archaeology of the last millennium and a half or so in at least this portion of the greater Kansas River basin. Thus, although this book does describe the sites and the collections from them, its primary objective really is this new narrative of the archaeology of central Kansas. To not present that narrative would have been to waste the information potential of the collection and I never would have been able to justify to myself the several thousand hours I have expended on this effort.

As a final note, the collections are a valuable resource and source of a considerable amount of information about the past human experience in what is now central Kansas. This study accounts for their contents and pursues several analyses that realize part of their research potential, and that has led to the narrative in Chapter 11. That narrative, however, remains provisional in some ways and requires additional detailed analyses of various parts of the collections. These eventually should be undertaken with this material and, for this, it is vital that the collections remain accessible. Recognizing this, the Reeds' wishes are that the collections and their associated records will be curated at the Kansas Historical Society (KSHS).

Acknowledgments

Publication of this volume was supported by the Reed Publication Fund of the Kansas Anthropological Association (KAA). This fund paid for the maps, several line drawings, copy-editing, layout, and printing. Allan Potter produced the maps that form Figures 1.1, 3.1, 6.1, 7.1, 8.1, 9.1, and 11.3. Christine Ewing did the drawings for Figures 3.4, 10.6, and 11.1. Ewing also did the cover design, which incorporated two lifeways drawings she originally did for a timeline brochure produced by the Association of Professional Archaeologists of Kansas (PAK). They are reproduced here with the permission of the PAK board (as a member of that board I recused myself from the vote on this question). Vita Tucker and Virginia Wulfkuhle pulled a selection of historic photographs from which I selected images for use in the Preface and Chapter 2. Virginia also facilitated obtaining the high-quality scans of the images in Figures 3.3, 4.1, 4.2, and 4.3. Except for these and unless otherwise noted, I am responsible for all other illustrations, including all artifact photographs. Nancy Arendt spent part of a weekend helping me get over the hump of finishing those photos. At my insistence, the manuscript for this book was peer-reviewed. I thank reviewers Donald Blakeslee and Margaret Wood for reading the manuscript and offering many useful comments. Virginia Wulfkuhle coordinated the review and production processes.

I personally performed all the work of analyzing the collections and writing this study, but I should acknowledge others, because I have at times drawn on knowledge gained from looking at or working with other collections or discussing pertinent issues. Some of that was done specifically for this study, sometimes it was done in the context of performing other studies but I found the information useful to this one as well. In no particular order, and with some terror that I might inadvertently (and I assure you it would be inadvertent) overlook someone, I thank Don Blakeslee for showing me parts of the Richard Stauffer Collection at Wichita State University (WSU), Chris Garst for helping me access many collections at the KSHS, Mary Adair for the collaboration on a NSF-supported grant to work with Smoky Hill phase materials from over a wider area of Kansas (and NSF for that support), Bob Hoard and Jack Hofman for helping with identifications of some of the older materials in these collections, and all these and other individuals for discussion of many aspects of Central Plains archaeology.

In the end, though, I take full responsibility for how this volume turned out. It is not quite as I envisioned it when I started, but that is because I learned so much from doing it. It will become very clear that in spite of being centered on the collection, describing the collection was not the end in itself but rather the means to an end. The book really is about past life and changing lifeways in a unique part of central Kansas. To a twenty-first century professional archaeologist like me, that is what archaeology *is*.

Donna C. Roper
Manhattan, Kansas
Spring 2015

CHAPTER 1

Introduction

The Plains have been called the "Great American Desert" (Long 1823) and the "Land of Sun, and Wind, and Grass" (Wedel 1961), phrases that may connote a monotonous uniformity to the landscape. Modern Plains-dwellers, of course, know this is not the case, and prehistoric peoples of the Plains did too. Landscape and natural resource variety occurs throughout the Plains but may be particularly marked across the Central Plains of Kansas and Nebraska. Here, a climatic gradient, as well as gradients in altitude and geological substrate, foster a gradient in grassland composition, extent and diversity of timberlands, and composition of faunal communities, not to mention quantity of available water. Rivers that flow in a west-to-east direction cross-cut a succession of geologic strata of varying composition and varying resistance to erosion. The result is an environmental mosaic composed of localized and often unique combinations of biological, geological, and hydrological resources. These localities, however, are not necessarily equivalent in their attractiveness for human settlement. Most localities can be expected to have an archaeological record, but the nature of that record may vary considerably in intensity, continuity, timing of particular events, and portions of settlement systems represented. Of course, they also may vary in their potential for site burial and preservation. A full accounting of the past human experience on the Central Plains comes from the recognition that all localities and settings have their own story to tell and that a full accounting will result only from the cumulative study of these individual localities.

Making this ideal a reality is the eternally unfinished task of archaeology. The landscape is vast, the localities requiring study are many, site destruction is ongoing, and there are only so many archaeologists in the region. Although there is no magic answer to this situation, an element of that answer is the local knowledge provided by conscientious amateurs who walk the land, record sites, and place the results of their labors in proper repositories for interested (and qualified) researchers to access. This situation is not unique to archaeology. The contributions of amateur astronomers to finding comets and making other types of systematic observations are vital to astronomy, as in ornithology are activities such as the Christmas Bird Counts that are conducted largely by amateur birders. The difference between the amateur astronomer and the amateur archaeologist, though, is that repeated observations of a comet or double star in no way diminish those objects, whereas an archaeological site is diminished by each act of collecting. It is, therefore, incumbent upon investigators, professional and amateur alike, to carefully document their findings. It is part of what separates an archaeologist from a pothunter.

Fortunately, many localities on the Plains are or have been favored with conscientious amateur archaeologists whose activities contribute to telling the story of the human past in their locality. Prominent among these favored localities is the Salina area of central Kansas or, perhaps better stated, the Smoky Hill/lower Saline/lower Solomon rivers confluence area of Saline and Ottawa counties. This Central Plains locality has a rich resource base and is highly attractive for human occupation. Not surprisingly, it also has a rich archaeological record, too little considered by professional archaeologists until recently, but carefully documented by a succession of dedicated local amateur archaeologists (see Chapter 2). One of these, and the most recent of them, is Harold Reed.

Reed surface-collected artifacts from archaeological sites in the Saline/Ottawa counties area from the mid-1960s to the early years of the twenty-first century, filing the original site form for many of the sites he knew. The bulk of the site records and collections result from the systematic survey of lands in a defined study area in north-central Saline County and, to a spatially more restricted but just as important extent, central Ottawa County, Kansas (Figure 1.1). He also made collections from a few

sites beyond this study area, and those from several important sites that were recorded before he began collecting. Reed's study area is one of the particularly rich environmental settings on the Central Plains away from the Missouri River. Circumstances of local subsurface geology, outlined in Chapter 3, facilitated the creation of the unique visible characteristics of this locality. Wide river valleys are filled with deep alluvium and are traversed by a comparatively narrow river meander belt, through which flow rivers that meander tortuously and change courses frequently. The result is a complex mosaic of river channels, river floodplains, and massive low alluvial terraces, heavily incised by cutoff river channels and meander scars within meander belts, which extend undissected for some distance beyond to the base of the river valley walls. Superimposed on this geological/hydrological mosaic is an equally complex biological mosaic of aquatic and terrestrial flora and fauna. No other locality on the Central Plains is configured in a manner identical to this one.

This configuration is pivotal, for it is landscapes such as this that have been the setting for the important changes from foraging to incipient agriculture to more intensive agriculture in the major river valleys of midcontinental and southeastern North America (Smith 1992). It is my contention that the area around the junction of the Smoky Hill, Saline, and Solomon rivers of central Kansas was the setting for a similar trajectory of change, albeit one that occurred on a smaller scale. For this reason, I have come to refer to this as the Central Kansas Riverine Area (CKRA). It is a setting that highly mobile foraging peoples of early periods of prehistory may have returned to repeatedly, for the setting likely was a predictable source of specific resources. As population levels rose and foraging ranges became increasingly smaller, the area also became attractive to peoples who were beginning to settle into more specific niches and make increasingly intensive use of the specific resources they provided. To these resources they eventually added a suite of crop plants adopted from the midcontinent, and, less than 900 or so years ago, achieved a degree of sedentariness. The CKRA probably could not have supported a large and dense population or one keying heavily on specific resources, and it may be no accident of history that one of the most prominent native cultural expressions that is *not* represented in the study area is the protohistoric and historic nucleated village tribes, with their intensive agriculture but low overall dietary diversity. It was, however, an ideal setting for the late prehistoric sedentary people who inhabited dispersed family farmsteads, used the diverse resources of the numerous microenvironmental zones surrounding those farmsteads, and conducted an agriculture that likely featured small dispersed plots rather than larger fields. This basic way of life became widespread on the Central Plains in early centuries of the second millennium. It did not appear everywhere simultaneously, but rather expanded throughout the area following its inception in specific localities. It appears on the basis of evidence described later that the CKRA is one of those areas.

In truth, although there are a few other sources of information, because of the rapid disappearance of sites, the Reeds' collections and records from their long-time survey provide what probably will stand as the major record of the past human experience for this area. These collections and the records that accompany them serve as the basis for this study of the archaeology of central Kansas. In all, the collections considered in this study come from 54 archaeological sites in Saline County, four sites in Ottawa County, and one each in Lincoln and Smith counties. The Reeds, usually Harold, but Margie or Debbie in a few instances, filed the original site forms for 51 of these 54 sites. The combined collections contain approximately 5400 objects manufactured over a period of approximately 11,000 calendar years. The large majority of sites, however, are attributable to roughly the first centuries of the second millennium.

Also lying within the Reeds' major study area, in Saline County, northeast of Salina and near the confluence of the Saline River with the Smoky Hill River, is the late prehistoric cemetery variously known as the Whiteford site, the Indian Burial Pit, the Salina Burial Pit, or by its state site number, 14SA1. It further complements the survey and habitation site excavation data by providing another line of evidence for understanding the late prehistoric occupation of the CKRA. The conclusions to my detailed study of that site (Roper 2006a) identify and describe a true prehistoric community that thrived in the area in approximately the second

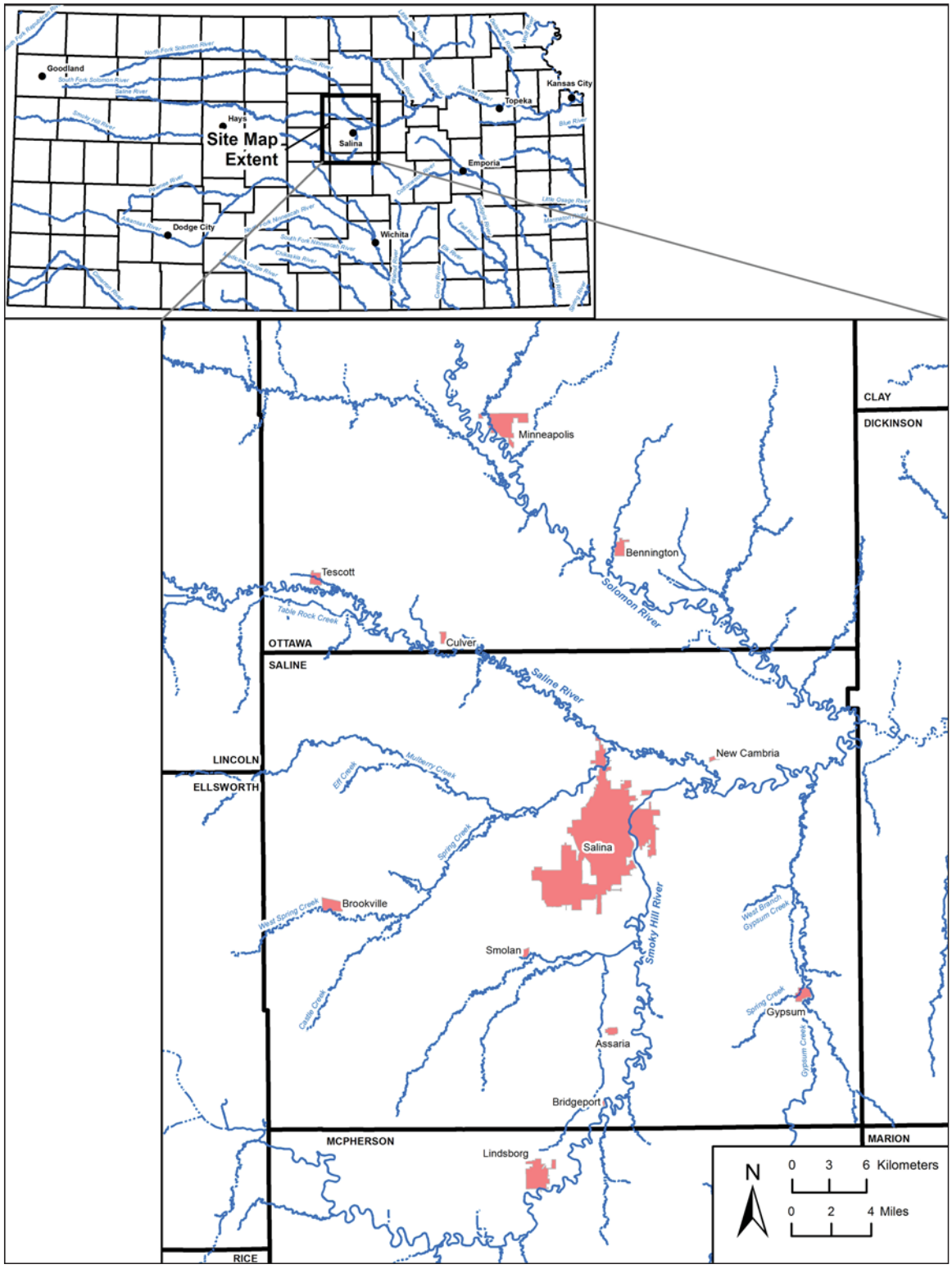


Figure 1.1. Study Area for this Book

and third centuries of the second millennium. This study, then, is a companion to that one, in that it more fully describes and analyzes materials from many living site remains from this community and provides a basis for extending the discussion and interpretations offered in the earlier study.

Few Kansas localities have as comprehensive a record to work from and have as fully told a story as this one. The late prehistoric occupation is only the best-known of the cultural complexes represented in the CKRA and does account for the majority of the collections. Prior to late prehistoric times, however, and a precursor to the occupation of this area by the major cultural complex of those times, the area was used for short-term resource procurement, with the area used repeatedly as people returned again and again during the course of many centuries. This does not, however, mean that their lifeway was unchanging during that interval. Instead, the record suggests changes in technology that almost certainly correlate with changing diets and settlement strategies. The prominent sedentary late prehistoric occupation was, in a sense, the culmination of centuries of change. Tracing this several-millennia-long trajectory is the basis of the new narrative of central Kansas prehistory that I promised in the Preface and will deliver in Chapter 11.

CHAPTER 2

Archaeological Investigations in Central Kansas, 1934 to the Present

Archaeological investigations in central Kansas began possibly as early as the mid-1920s and, through a serendipitous event (recounted below) came into the mainstream of Central Plains archaeology in 1934. This latter is due to the work of professionals based in Nebraska at the time, but avocational archaeologists from the Salina area were, so to speak, present at the creation of modern archaeology on the Central Plains and contributed information that was vital to that effort. The achievements of the 1930s have enduring importance (I discuss this in Roper 2008b), but professional activity was not sustained, and avocational archaeologists have continued to play an important role in documenting the area's archaeological record. Much of this attention has centered on the Smoky Hill phase, which is so prominently represented in the area. The Reeds in effect inherited the legacy of the earlier work, and subsequently have contributed a considerable amount of new information. A review of work by the Reeds' predecessors outlines the milieu into which they came in the 1960s.

Guy and Mabel Whiteford

There is no question but that, with a few early exceptions, most of them in the Missouri River valley area at the eastern edge of Nebraska and northeast Kansas, the systematic and anthropologically-oriented practice of archaeology on the Central Plains began in the early 1930s. It was due to the patronage of A.T. Hill (Asa T. Hill, but he preferred to be called A.T.) of Nebraska, and the collaboration he formed with William Duncan Strong, a professor of anthropology at the University of Nebraska. While Strong's tenure at Nebraska was brief, 1929 to 1931, his first graduate student was Waldo Wedel who, as many know, soon synthesized the foundation of Kansas archaeology. Hill and Strong began their investigations in 1930, with Hill sponsoring a series of field parties in 1930, 1931, 1932, 1933, and 1934. Strong co-led the excavations in 1930 and 1931; Wedel was the principal field assistant throughout all five seasons. The field party confined its work to Nebraska during the first four years. In 1934, however, it dipped into Kansas (Figure 2.1), which at that time was considered "a blank on the archaeological map of the central Plains," but where there was "reason to believe that in the Solomon and other northern river valleys of the state would be found prehistoric remains showing definite affinities with those from the Republican valley of southern Nebraska" (Wedel 1934a:211), a valley the Nebraska parties had explored in 1930 and 1933 (Strong 1935; Wedel 1933) and where they also worked extensively in 1934 (Wedel 1934b). Thus, in 1934, in Kansas, while excavating on the Great Bend aspect Paint Creek site, 14MP1, in McPherson County, they met Guy and Mabel Whiteford of Salina and a course of action was set in motion that would have far-reaching implications.

The work of Guy and Mabel Whiteford has received extensive recent study (Roper 2003, 2006a:44–51) and needs only summary in this context. The Whitefords were married in 1925 and began collecting artifacts soon thereafter. Like so many others in their time, they knew of the Paint Creek site and visited it periodically to collect and to excavate some of the numerous large, refuse-filled cache pits that are a major feature of that site. That is what they were doing one day in early July 1934 when they unexpectedly encountered the Nebraska field party. As a newspaper article about the Whitefords' archaeological career recounts, though, once they got over the initial surprise of finding someone else in one of their favorite collecting spots, the Whitefords began showing Hill and Wedel their collection and learned that it had "real scientific value" (*Kansas City Times*, February 10, 1938). It is clear from newspaper accounts, preserved correspondence, and the Nebraska party's field notes that, over the next few days, the Whitefords showed Hill and Wedel a number of sites near both Salina and Minneapolis. Subsequently, once the

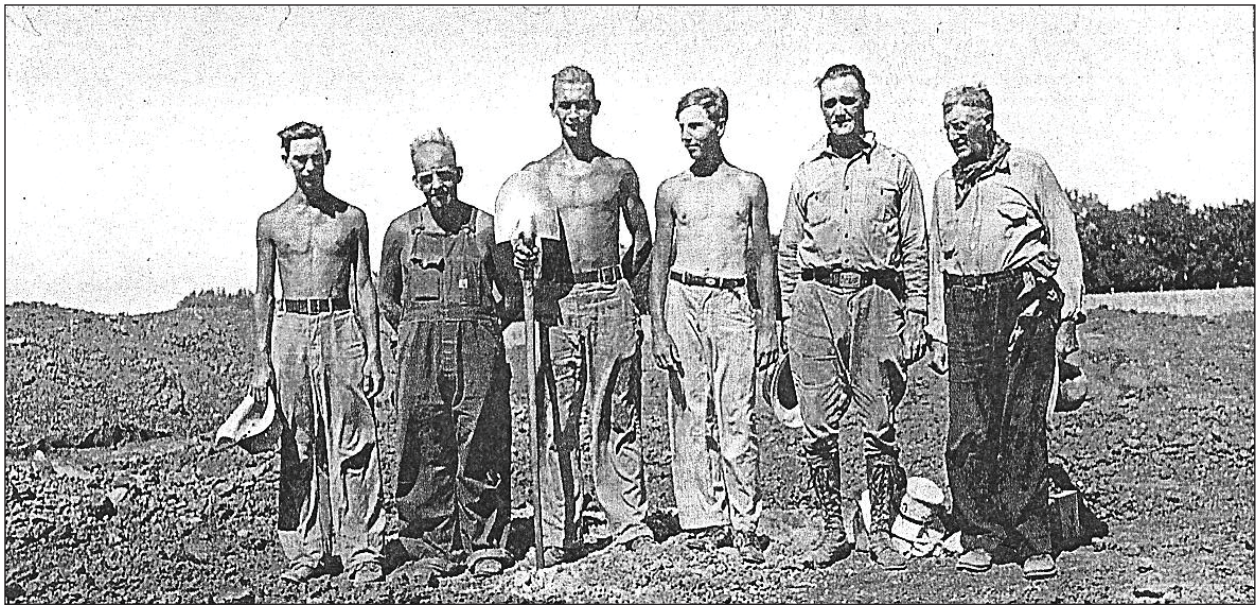


Figure 2.1. Nebraska Excavation Crew at the Minneapolis Site, 1934

Nebraska people finished their work at Paint Creek, they moved up to the Minneapolis area in Ottawa County and excavated three lodges (Figure 2.2) on what is now called the Minneapolis site, 14OT5 (Wedel 1934a). Minneapolis later became one of the type sites for what Wedel (1959:563) eventually designated the Smoky Hill phase, the predominant late prehistoric cultural expression in central Kansas.

The Whitefords' work contributed in other ways as well to Wedel's definition of the Smoky Hill phase. The number of what we now call Smoky Hill phase sites that the Whitefords knew by the time they encountered Hill and Wedel in 1934 is uncertain, but it was more than just the Minneapolis site. One imagines (and for the most part one does have to imagine, since the records are not too specific, but it does not seem much of a leap) that the Whitefords either participated in or at least visited and observed the Minneapolis site lodge excavation (Hill's field notes do briefly allude to "Whiteford out" on the site one day, but they say nothing of his [their?] involvement). These excavations would have revealed to the Whitefords the kinds of remains that are hidden below the surface of sites they had been collecting from for a number of years and, in any event, it stimulated them to begin excavations on their own. Over a period of 12 years, they excavated five lodges. Two of the five were on the Kohr site, 14SA414, in Saline County (House 1 excavated in 1936, and House 2 in 1937); the other three were in Ottawa County, one of them near Minneapolis (the Markley site, 14OT308, excavated in 1945, Figure 2.3), the other two a bit farther away (Lamar, 14OT304, excavated in 1935 and Aerhart, 14OT305, excavated in 1934). Although a full report of these excavations was issued only recently (Roper 2001), the Whitefords had summarized their work on one of the Kohr site houses (Whiteford 1937:3–10, 1941:11–18). Wedel (1959:513–517) briefly reviewed the same work, using it also to help define the Smoky Hill phase.

Beyond the lodge excavations, the Whitefords are most closely associated with the excavation of what



Figure 2.2. Completed Excavation of House 3, Minneapolis Site, 1934



Figure 2.3. Guy Whiteford at House 1, Markley Site, 1945

became known as the Indian Burial Pit, 14SA1, also known as the Salina Burial Pit or the Whiteford site, a Smoky Hill phase cemetery. Stimulated by the Whitefords' Kohr House No. 1 excavation in 1936 and knowing stories passed down through the family of bones being found in a particular place on the property, the landowner's grandson went in search of the cemetery and found it in the fall of that year. He called in the Whitefords and the three of them immediately began excavating. By 1937, they opened the Indian Burial Pit as a tourist attraction. The further history of this site is detailed in Roper (2003, 2006a:44–70). The Whitefords also described it in two booklets (1937, 1941). Waldo Wedel spent one day in 1940 studying the cemetery and reviewed it in his 1959 Kansas archaeology book (Wedel 1959:517–522). The cemetery later became another of the Smoky Hill phase type sites (Wedel 1959:564). The State of Kansas purchased a quarter-acre of land containing the Indian Burial Pit in 1989 and reburied the remains in early 1990. Before the reburial, however, they conducted a final detailed inventory of the human remains and funerary objects in the cemetery. The records from that inventory, along with Wedel's records and other available data, were the basis for my (Roper 2006a) recent detailed description and analysis of the site.

The Whitefords turned over the operation of the Indian Burial Pit to the landowners in 1946 and left Kansas near the end of that year. Their legacy unquestionably rests on the excavation and first decade of operation of that site, but it really is larger than that. They knew a series of Smoky Hill phase lodge sites, and investigated several of them. Their continued interaction with professional archaeologists, particularly Waldo Wedel, was mutually beneficial. The Whitefords were on the land and knew the sites; Wedel knew what to make of the sites and how to use the information the Whitefords were providing. Kansas archaeology is the richer for having Wedel's synthesis. In turn, the part of Wedel's synthesis concerned with central Kansas was greatly facilitated by the information the Whitefords supplied.

Hill and Wedel's 1934 work in central Kansas was limited, but the impact of that season's work was huge. It included excavating 12 lodges on sites in Nebraska and 3 more in Kansas. The results were quickly reported (Wedel 1934a, b; that is the cover date, the journal actually was released in early 1935). Although the reports were mostly descriptive, they included the first cultural classification system for the Central Plains (Wedel 1934c:251–255). Nominally by Wedel, it really was a collaborative effort with William Duncan Strong who at that same time was classifying the Nebraska materials (see Chapter 4). At that point, the classification considered the Minneapolis site remains as a division of Upper Republican culture (Wedel 1934c:252). A few years later, Wedel (1940a:345) still portrayed these remains on a cultural classification chart, but also (Wedel 1940a:293) regarded Minneapolis, the Indian Burial Pit, and the Griffing site in Manhattan,

14RY21, as unclassified sites within a larger cultural tradition. By the time he published his *Introduction to Kansas Archeology* in 1959, however, Wedel had chosen these three as the type sites of what he, for the first time in print, named the Smoky Hill phase (Wedel 1959:563). Clearly, therefore, the remains from the Central Kansas Riverine Area played important roles in shaping the prevailing classification of late prehistoric remains on the Central Plains. The critical role the Whitefords played in bringing them to Wedel's attention is just as clear.

Ralph Bell, the Stauffer Brothers, and the Beginnings of Harold Reed's Involvement

A number of amateur archaeologists and collectors followed the Whitefords and explored sites in the Salina area, although after the Whitefords, none of them have had the impact that the Reeds have. An early one was Ralph C. Bell, a Salina electrician. The history of Bell's activity is not well documented. Bell's extensive collection, now held at Kansas State University (KSU), includes some Smoky Hill phase material, reputedly from Saline County and presumably from a site or sites close to Salina, but the amount of material is small, documentation is lacking, and the material's provenience cannot be determined beyond county. The largest part of Bell's collection is from two Great Bend aspect sites in northeast McPherson County. One of these is the Paint Creek site, where Bell and his collecting partner, Robert McReynolds, excavated a number of pits. A considerable amount of material also comes from an outlier or extension of that site, now designated 14MP463, that Bell and McReynolds found apparently in the late 1950s and where they did some excavation around 1959 or 1960 (Roper 2009a reviews what little is known about Bell and McReynolds' work on this site). Other materials in the Bell Collection are from Rice County.

Bell had two nephews, Jim and Richard Stauffer (Figure 2.4), who also became involved in collecting and excavating. They did some excavation on the Paint Creek site, but also knew sites near Salina. The Salina-area portions of their collections, now at WSU (Blakeslee 2004), are much smaller than the Reed collections, and the Stauffer collections contain no materials from Ottawa County sites. They

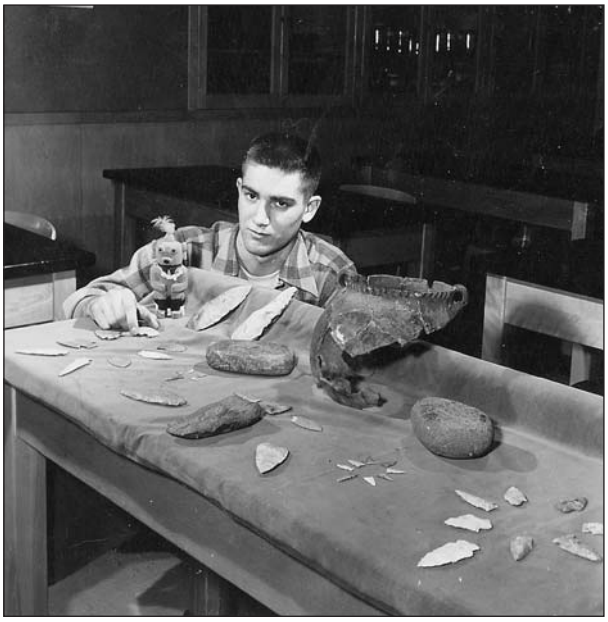




Figure 2.4. Jim Stauffer and Richard Stauffer

include surface-collected materials from some of the same sites as Reed visited and some sites that apparently Reed did not know. They include materials that the Stauffers excavated from two Smoky Hill phase sites. One of these is the Winslow-Debold site, 14SA403, at which the Reeds and the KAA later also worked. Here, in late 1956, the Stauffer brothers trenched one lodge and at least one pit, recovering a quantity of material. A brief report of this excavation by Richard Stauffer appeared in the *Kansas Anthropological Association Newsletter* in 1957 (Stauffer 1957). The Stauffers also conducted a limited excavation at the site now designated 14SA409, in the Saline River valley upstream from Salina. Their notes indicated that they at least partially exposed several burials, which they immediately re-buried. More will be said about each site later in Chapter 8.

It is fair to say that one aspect of the Stauffer brothers' legacy to central Kansas archaeology is how they drew Harold Reed into becoming an active amateur archaeologist. At one point in the early 1960s, during which period he was actively collecting and excavating, Jim Stauffer worked in the woodworking shop the Reeds owned and operated. Harold became interested in archaeology through this connection and began going with Jim to work on the Sharp's Creek site, 14MP408, the other major Great Bend aspect site in northeast McPherson County. Around the mid-1960s, Reed also came into contact with State Archeologist Tom Witty and became involved with the KAA. The results fill a large part of this book.

Work by the KAA—1968 to the Present

For a time, Saline/Ottawa counties sites were a frequent location for KAA summer excavation programs. These began in 1968, when KAA members spent 4 days (July 4–7) excavating House 1 at the Winslow-Debold site (Figure 2.5). Although some information from that excavation has been circulated and cited on various occasions, the 1968 excavation has never been comprehensively reported.

Two years later, in 1970, the KAA again participated in work in Saline County, this time at sites 14SA414 (Kohr) and 14SA415. The KAA ultimately did not have the opportunity to do much work at 14SA414. The site really is an arbitrarily-defined set



Figure 2.5. KAA Excavation at the Winslow-Debold Site, 1968

of lodge remains surrounding the Indian Burial Pit (14SA1). The Whitefords said in 1941 that they had seen indications of as many as 12 to 15 lodges in the cemetery vicinity (Whiteford 1941:18; see also Wedel 1959:512–513). Richard Stauffer's records (held at WSU) delimit it somewhat differently and include more lodge locations. Given that lodges within most "sites" are dispersed and almost certainly were not contemporaneous with one another—or in other words that these were not true villages or hamlets—neither designation can be said to be either "correct" or "incorrect." Regardless, in the spring of 1970, Tom Witty went to this location to try to find a Smoky Hill phase lodge for the KAA to excavate that year. According to records in the state files, it was at that time that Witty separated the Indian Burial Pit from the lodges surrounding it, retaining the number 14SA1 for the cemetery and assigning site number 14SA414 to the lodge cluster. This was, of course, the site where the Whitefords had excavated one house in 1936 and partially excavated a second one in 1937 (Roper 2001, 2003; Whiteford 1937, 1941). The Whitefords referred to it as the Kohr site, after several generations of landowners in the period 1878–1937, and so did I when I described the lodge excavations.

Perhaps more momentous than this administrative matter was the fact that the 1970 inspection of 14SA414 revealed that the lodge remains reported

by the Whitefords (who lived in the farmhouse on the site in the period 1937–1946) were no longer visible. One area where a house may have been was visible in 1970, but on the first day of the planned four-day (June 25–28) excavation, it became apparent to the excavators that, quoting from the field notes, it was "something other than a house." It could have been something else, or it could have been the remains of a lodge that had been severely reduced by cultivation and deflation. I have excavated into several of these elsewhere on the Central Plains and it is always frustrating to realize that what probably had been there perhaps only a generation or so earlier is no longer viable. In any event, since the Reed Collection does contain a small quantity of material from 14SA414, and since this is a key site in this study area, further discussion is deferred to the proper part of Chapter 8.

With the hopes of finding a lodge to excavate on 14SA414 unrealized, the KAA turned to nearby site 14SA415. This also was a Smoky Hill phase lodge site. Harold and Margie Reed, along with Earl and Iris Monger, had begun excavating it in April 1970 and had been working on it during April, May, and June of that year. With it unfinished when the 14SA414 plans fell through, Reed offered it for the KAA project. The KAA accepted the offer and completed the excavation in late June 1970 (Figure 2.6). The collection remains in the Reeds' possession. At Harold's request, I analyzed it and wrote the report for this site a number of years ago (Roper and Reed 2003). It is referred to and summarized in this book for completeness and because it does provide some information for the ceramic analysis in Chapter 10 and the synthesis in Chapter 11.

The 14SA415 excavation in 1970 was the last KAA excavation in the Salina vicinity. Subsequent attempts to locate lodges for new excavation have been unsuccessful, and now it appears that the remaining archaeological sites either are seriously diminished by cultivation (Latham 2006a) or destroyed by urban expansion of Salina. The exception was a KAA Fall Fling in 2010 that examined the Winslow-Debold site area. A few flakes but no indications of intact deposits were observed at that time.

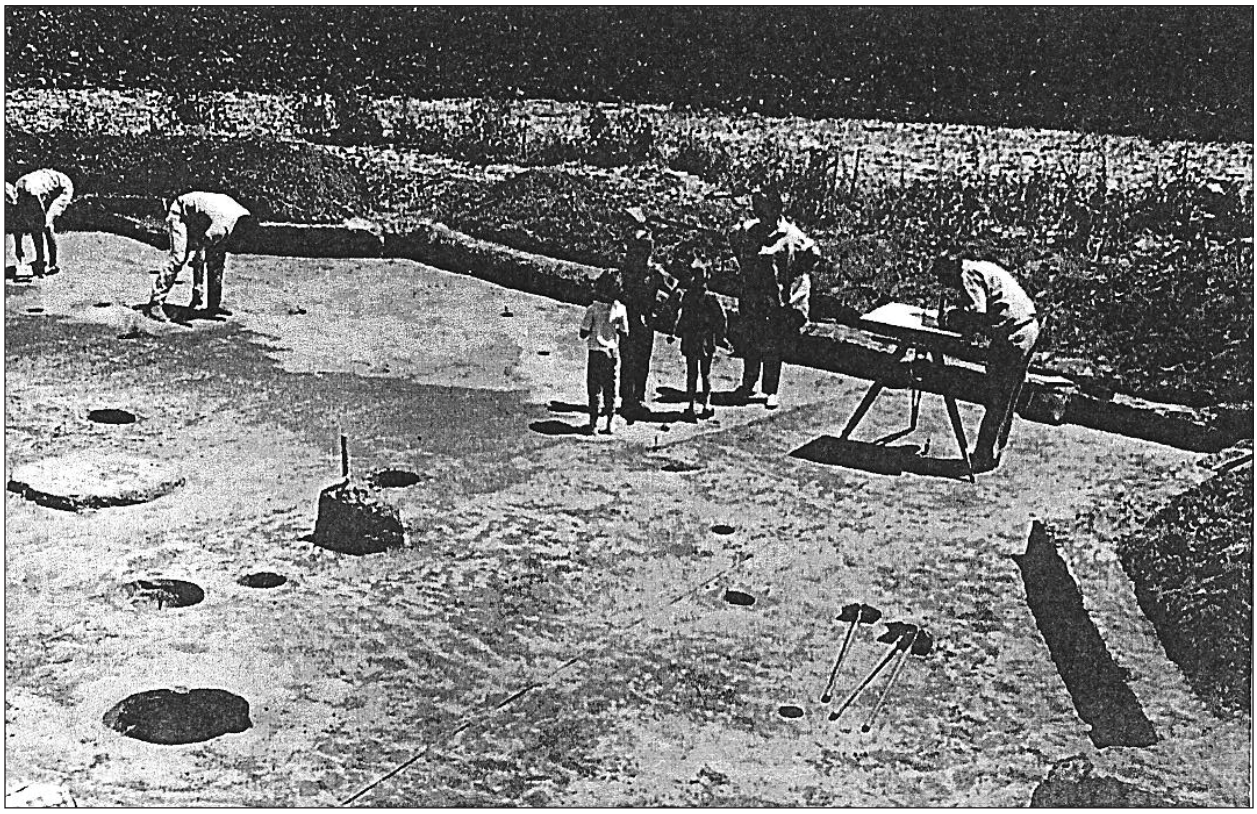


Figure 2.6. Nearly Completed Excavation at House 1, 14SA415, June 1970

Another set of excavations in the area was the work of Kansas Wesleyan University (KWU) at the Forsberg site, 14SA420, in the years 1972, 1973, and 1974. Led by George Taylor, KWU classes excavated one lodge in each of those years. The state site files contain a copy of a manuscript report, and Mark Latham (2006b) recently compiled a somewhat more comprehensive and up-to-date report. As with other sites in the area, information from this site is summarized in this study. The pottery also has been analyzed according to my standards and is used in comparisons later in this study.

Perhaps because of the discouragement of the 1970 inspection of the Kohr site, the KAA in 1971 shifted their attention from the Salina locality to the Minneapolis locality in central Ottawa County. As recounted earlier, this locality, like the Salina locality, had long been known to hold a substantial archaeological record. In addition to the Nebraska field party's work at the Minneapolis site, the Whitefords later excavated three lodges in the lower Solomon River valley, one each at sites 14OT304, 14OT305, and 14OT308 (Roper 2001, 2003). Other investigations have not been numerous. Floyd Schultz had earlier excavated one lodge at a site he called the Burns site. Burns is numbered 14OT2, but it might be the same site as 14OT305. Most of Schultz's other fairly numerous lodge excavations, however, were in the Republican River drainage in Clay County and none were in Ottawa County (Hawley 1993).

The Minneapolis site received renewed attention in the early 1970s, some with and some not with KAA involvement. In December 1970/January–March 1971, archaeologists from the KSHS Archeology Office conducted salvage investigations on parts of the site being affected by land-leveling. At that time, House 23 was completely excavated (Figure 2.7) and House 24 was partially excavated (field notes in the 14OT5 site file, Archeology Office, KSHS). This work, particularly that at House 23, is discussed in a University of Kansas (KU) Master's thesis (Fosha 1994). Later in 1971, the KAA chose the site for their summer excavation, beginning the excavation of House 8 at that time (Witty 1971) and completing it in 1973 (Witty 1974; Figure 2.8). That house also is considered in Fosha's (1994) Master's thesis. Otherwise, however, the 1970, 1971, and 1973 work has never been reported in full.

Portions of the Minneapolis site collections from both the 1934 work and the early 1970s work also have been used in other studies. Another KU student examined some of the pottery in the 1990s (Beck 1998). More recently, I and collaborators have done some work with compositional analysis of pottery (Roper et al. 2007; Roper et al. 2010) and with analysis of pottery vessel use (Cummings and Roper 2010), and materials from all work, including that in 1934 and the early 1970s, is included in the major Smoky Hill phase ceramics study currently being completed. Some of these results will be referenced in later chapters.



Figure 2.7. Excavation of House 23, Minneapolis Site, 1971



Figure 2.8. Feature Excavation in House 8, Minneapolis Site, 1973

Some Final Notes

This overview highlights major archaeological activities and contributions to knowledge of the region's archaeological record prior to and concurrent with the Reeds' participation. These are activities documented in the published record. Certainly other individuals also knew/know and collected/collect from some of the same sites—some of Harold Reed's individual site notes allude to such, sometimes identifying other collectors, sometimes referring to them generically, and sometimes noting that a landowner had collected from a site on their property. These other collections, however, remain undocumented and, as such, currently do not contribute to new knowledge of CKRA archaeology. Should some of those individuals be reading this book, let it be noted that I would be interested in examining their collections. Fears that the state will confiscate them are unfounded—we only want to learn from them as we have with the collections made by the Reeds and other amateurs discussed in this chapter.

Finally, it is notable that all of the work reviewed in this chapter deals with the late prehistoric portion of the CKRA's archaeological record. Earlier materials, though, appear in the Reed Collection, as well as in the Stauffers' collections. The investigations of late prehistoric sites provide extensive information on a rather intensive occupation of the area over a much shorter interval of time than is commonly assumed; the earlier materials, which represent less intensive but at least continual occupation over a period of several millennia, reveal the cultural foundations for that late prehistoric cultural expression. Most of the rest of this book deals with that development. Before turning to it, however, it is necessary to set the stage by describing the landscape and its resources.

CHAPTER 3

Saline/Ottawa County Study Area: Central Kansas Riverine Area

Chapter 2 of the Whiteford site study (Roper 2006a:6–21) reviewed the general physiography and hydrology, geology and geomorphology, soils, climate, vegetation and floral resources, and fauna of the Salina area using a fairly detailed version of a standard format. What that account misses, however, is a sense of what truly defines the locality, in the sense of how its resources are configured and distributed, and what gives the landscape its unique character. The goal of this chapter is not to repeat the information in the earlier account, but to complement it by presenting the CKRA as an area to be lived in by peoples in the past. It seeks to accomplish this by first discussing the peculiar geological circumstances that led to its formation and reviewing how it is configured overall. It then reviews what resources were available and where they could be procured, and it lists some of the resources *not* available in the area and where they had to come from to be used in the area.

The study area, as already noted, lies within Saline and Ottawa counties in central Kansas (Figure 1.1). Its main feature is the Smoky Hill River and its broad valley in Saline County. Also important are the valleys along the lower ends of the Saline River as it flows across southwest Ottawa County and north-central Saline County, and of the Solomon River as it flows northwest-southeast through Ottawa County to its confluence with the Smoky Hill River in northeast Saline County. Important tributaries of the Solomon River include Salt Creek, which flows from the west to join the river in central Ottawa County, a few miles downstream from Minneapolis, and Pipe Creek, which flows from the northeast to also join the river near Minneapolis. A major tributary of the Saline River is the combined Mulberry and Spring creeks basin, which drains a part of west-central Saline County (and beyond to the west). These two streams join one another west of Salina and form Spring Creek proper, which then flows to the Saline River about 5.7 miles above the confluence of that river with the Smoky Hill River. The other Smoky Hill River tributary that will be mentioned in this study is Gypsum Creek, a fairly small stream that rises in extreme northern McPherson County and flows south to north through much of Saline County to join the Smoky Hill River about 5.1 miles downstream from the Saline River confluence and about 3.8 miles upstream from the Solomon River confluence. A defining characteristic of this entire area is the breadth of the stream valleys, the deep and undifferentiated alluvial fill within them, the manner in which rivers behave within their valleys, and the rich set of resources this landscape supports and provides.

A Unique Locality Develops

Landscapes are dynamic. They develop over a long interval of time and it can be events in the deep past, the remnants of which are deeply buried, that make a large difference in the present and on the present surface. This is the case in the CKRA. A physiographic map (Schoewe 1949:276) or a general geological map of Kansas (Ross 1991) shows the Central Kansas Riverine Area as lying on the eastern fringe of the Dakota Hills or Smoky Hills, the easternmost physiographic section of the Dissected High Plains border, just west of where this physiographic section borders the Flint Hills Upland. The walls of the river valleys in this area are dominated by lower Cretaceous-age bedrock formations (Figure 3.1), particularly the Kiowa Formation and, above it, the Dakota Formation. The Wellington Formation, however, flanks the Smoky Hill River valley just upstream from where this river receives the Saline River and is the lowest and oldest exposed bedrock formation in the area. This Permian-age formation has three members, the lowest and the uppermost of which are shales and the middle of which is the Hutchinson Salt Member (Gogel 1980). This is highly significant, for ancient geological processes associated with the uplift of the Rocky Mountains around 65 million years ago tilted

all Cretaceous and Permian (and older) formations in Kansas and eastern Colorado so that their surfaces dip to the west and the fractured east edges are exposed.

As it happens, in ancient times, the part of the Smoky Hill River upstream from the point at which it turns north in northeastern McPherson County actually flowed to the Arkansas River in a channel that cut northwest-southeast through McPherson County and beyond (Bayne and Fent 1963). The east-west segment of the Smoky Hill River northeast of Salina at that time was part of the Saline River. The south-to-north-flowing segment of the Smoky Hill River through northern McPherson and Saline counties between roughly Bridgeport and Salina was a smaller tributary of the ancient Saline River flowing in a course that now is that segment of the Smoky Hill River. This small tributary paralleled Gypsum Creek and the streams in Dickinson County (Holland Creek, Turkey Creek) that flow in nearly due south-to-north courses to the Smoky Hill River. Unlike them, however, it flowed along the edge of the Hutchinson Salt Member. Salt, of course, cannot be exposed to water for long without dissolving. As recounted by Gogel (1980:12–14), therefore, ancient dissolution of the exposed edge of the Hutchinson Salt Member produced an underground void into which adjacent and overlying bedrock units collapsed, leaving deep and broad valleys near the edge of the Wellington Formation. Headward erosion of the small (unnamed) tributary of the ancient Saline River caused the stream to eventually reach and pirate the Smoky Hill River in its ancient channel southwest of modern Lindsborg. This eventually disconnected it from that southeast-flowing channel and, via the broad valley formed by the collapse along the edge of the Wellington Formation, connected it to the ancient Saline River and formed the overall modern Smoky Hill River configuration (Gogel 1980:13). Similarly, to the north, the Solomon River also flows near the northern edge of the Hutchinson Salt Member and probably has similarly dissolved the edge of that formation, creating the river's broad lower valley. The Saline River and Salt Creek, both of which lie between the Solomon and the Smoky Hill valleys, flow across the Hutchinson Salt Member and may have created their substantial valleys by cutting into the salt formation, dissolving it, and thus causing their valleys to widen by similar processes of collapse.

Over the many millennia since these broad and deep valleys were formed, they have become filled with Quaternary alluvium. For the most part, the chronology for this alluvial fill is not studied. The exception is the Kanopolis Lake area of Ellsworth County, on the Smoky Hill River upstream from the present study area and beyond the area with CKRA characteristics. Here, alluvial fill, which may be around 45 feet thick, forms a series of stepped terraces. The lowest sediments of the highest, and oldest, terrace (T-2) are not dated. Sediments in the upper parts of the T-1 are as old as around 4500 radiocarbon years (about 5000–5200 calendar years) and Woodland sites are found on its surface. The modern floodplain (T-0) is probably less than 200 years old (Mandel 1992:47–54).

A terrace is really an old floodplain that a river has abandoned as it downcuts and builds a new and lower floodplain. It is common for valleys to exhibit a series of terraces and a modern floodplain, representing alternating episodes of downcutting and aggradation, interspersed with periods of stability. Rivers, however, do not always shape their valley fills this way and it appears that the Smoky Hill-Saline-Solomon rivers confluence area is an exception. The valley fill is deep. Borings in several places within the major valleys indicate that the depth of alluvium (i.e., depth to bedrock) is as much as 69 feet (Latta 1949:33, working on the main stem of the Smoky Hill River northeast of Salina) or even 90 feet (Cline 1974:41, working on the lower Saline River about five miles from its confluence with the Smoky Hill River). Judging from both topographic and soils maps, as well as visual inspection of the area, the meandering rivers have not created a series of stepped terraces within the valley. Instead, the valleys feature a single, overall flat, although dissected, alluvial surface. The age of this surface has not been determined, but this study will show that archaeological sites at least six or seven millennia old are found on the surface or at most are shallowly buried.

One other quirk of geology also likely influenced the development of this broad unstepped alluvial formation. About 15–20 miles downstream from where it receives the Saline River in the Abilene area, the Smoky Hill River enters the Flint Hills

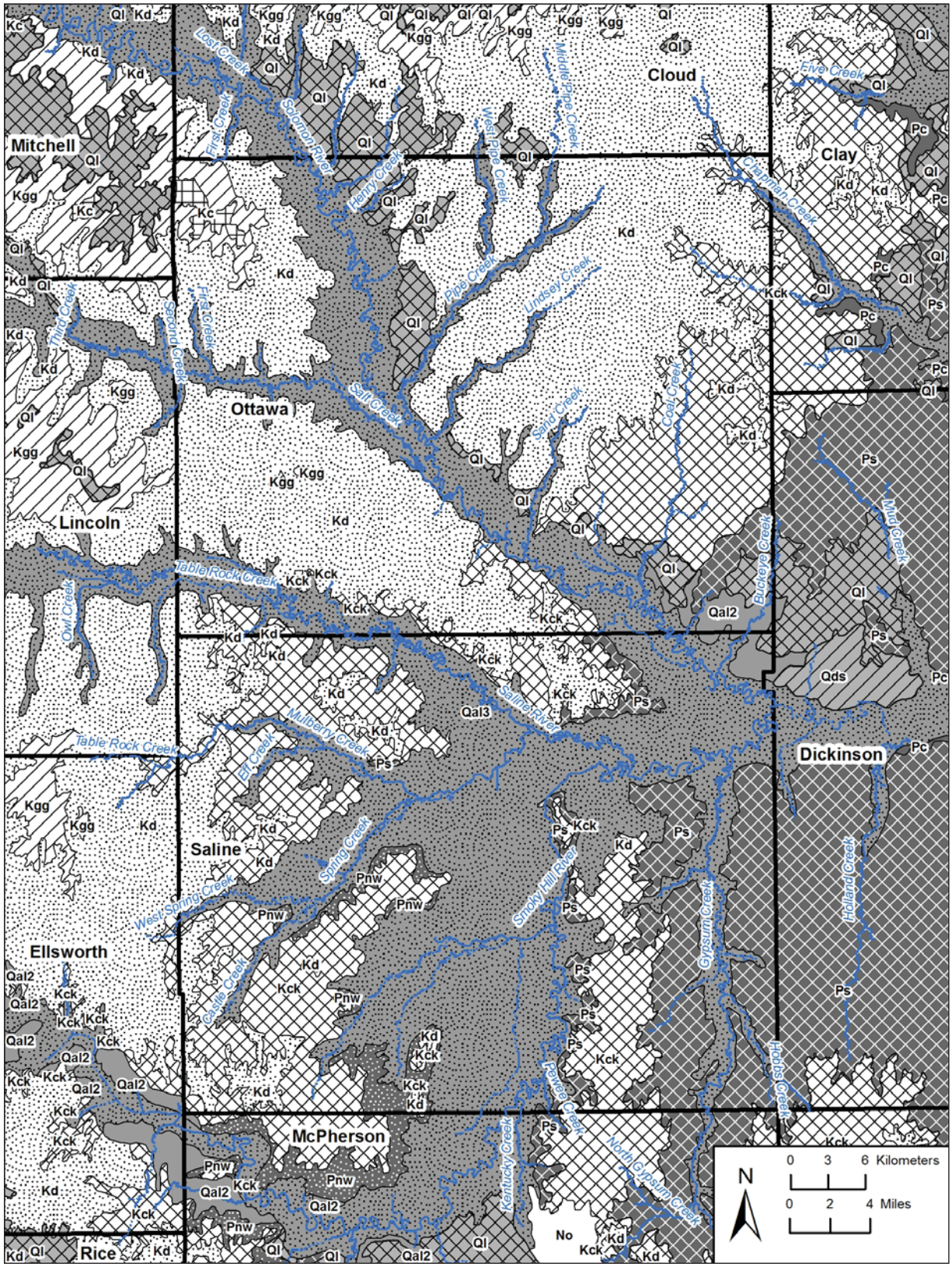


Figure 3.1. Surface Geology of the CKRA



Figure 3.2. Example of an Old River Channel Scar on the Terrace near the Minneapolis Site

Upland. Although the Flint Hills bedrock formations contain some shale members, dominant formations are limestone with extensive quantities of chert. These formations and their members are much more resistant to erosion than are the bedrock units of the Salina area. Accordingly, at this point, the river valley noticeably narrows. This narrowing produces a funnel effect, and sediment accumulates as drainage becomes backed up in what is, in effect, the top of the funnel. The result is what might somewhat light-heartedly, but accurately, be thought of as a gargantuan bowl of alluvium cut by the meander belts of some moderate-sized streams.

The river meander belts shallowly dissect the upper part of the thick alluvium. Rather than steeply downcutting, each river has moved from side to side within its meander belt, creating a series of lateral accretion features that grade into one another, and a series of cutoff meander scars (Figure 3.2) that sometimes intersect one another and that cumulatively reflect channel changes over an unknown interval of time. This complex mosaic of a broad and undifferentiated terrace surface away from the rivers; a meander belt holding the river channels, old meander scars, and the point bars—younger surfaces—formed within meander loops make the CKRA one of the richest riverine areas in Kansas away from the Missouri River valley. The modern appearance of this landscape probably is a poor reflection of what a few centuries ago must have been a very rich area with a flowing stream bordered by a mosaic of extensive wetlands formed in meander scars and oxbow lakes, and small floodplain surfaces that would have made excellent, naturally tilled and naturally irrigated, agricultural fields. A large expanse of prairie-covered undissected terrace extended away from this meander belt to the base of the river valley walls some distance away.

Geological Resources in and around the Central Kansas Riverine Area

The available geological resources—rocks, minerals, clays—are highly pertinent to understanding certain aspects of the economics of past societies, making it important to describe the availability of major resources, not only within the study area, but surrounding it. Phrased differently, it is important to recognize where certain resources were obtainable, be that within the study area or at varying distances from it. If those distant resources were critical, as some were in the CKRA instance, then

how they were procured becomes a matter for later evaluation.

The bedrock units of the Plains represent solidified sediments originally laid down at the bottom of a large inland sea that continuously varied in configuration but persisted in some form for about a half billion years prior to around 65 million years ago. Its final drainage around that time coincided with the Laramide Orogeny, a mountain uplifting event (the definition of an orogeny) that uplifted old rocks from the earth's mantle and thrust them up through rock layers on the sea floor, forming the Rocky Mountains. To understand the effect of this massive uplift, take a short stack of sheets of paper and hold it horizontally and as flat as you can. Then take the fingers of one hand and press them upward from below one edge of the stack. You will create a ridge in the paper above your fingers. Had this been a real orogeny, or at least the one that uplifted the Rocky Mountains, the upthrust rocks would have burst through the top of that ridge, leaving the sides of the ridge standing nearly vertically and ruptured at the top. Go to Garden of the Gods in Colorado or the Hogback behind Denver and you will see vertical rocks that got into this position this way (Google Earth is an instantaneous and low-cost way to do this, and it really does show the rocks in their vertical position). Then look to the side of your paper ridge, and you will see a trough with the surface of its far edge inclined toward the ridge representing your uplifted mountains. In reality, the far (high) edge of this incline also would have ruptured, and were you to observe this with your stack of paper, traversing this fractured edge and moving toward your uplifted mountains would take you progressively across the edges of higher sheets of paper. Once you see what happens with your stack of paper, you see what happened to the bedrocks of the ancient sea floor when the mountains were thrust up.

The newly uplifted mountains were, however, immediately and subsequently continuously subject to erosion on a grand scale. Erosive forces stripped rock and sediments from the new mountains and carried the material downslope, redepositing it as a vast outwash plain that extended and, although now somewhat reduced in lateral extent, still extends well onto the Plains in front of the mountains. Sediment, now cemented with calcium carbonate and constituting a bedrock formation in itself, was deposited atop the older rocks and overall lies as a vast wedge-shaped formation with the thickest edge toward the west and a surface that inclines to the east. Its deposition ceased around 5 million years ago. Rivers have been incising and eroding it ever since, exposing in their valleys bedrock units older than the orogeny, and causing the edge of the outwash plain to recede westward. The largely uneroded, although periodically incised, plain on this outwash surface is the High Plains; the eroded and dissected eastern edge is the Dissected High Plains (Fenneman 1938; Schoewe 1949).

To move east-west along I-70, then, is to move across a progression of rock formations, and specifically to move westward along that highway is to move through a progression of increasingly younger bedrock formations, including Pennsylvanian system rocks in the eastern part of the state, Permian formations that define the Flint Hills, and a succession of ever-younger Cretaceous-age formations from the west edge of the Flint Hills to the western edge of Kansas. Tertiary-age formations representing the outwash from the new Rocky Mountains overlie the Cretaceous formations from around Ellis County and on to the west. The *Geologic Map of Kansas* (Ross 1991) readily shows this, and the formations, their ages, their composition (limestone, shale, sandstone, etc), and other details are described in technical (Merriam 1963) and more popular (Buchanan ed. 2010; Buchanan and McCauley 2010) accounts, as well as in numerous county geological studies.

That the exposed rocks are a succession of many bedrock strata has two implications that are opposites to one another: 1) a variety of rock types are exposed through the Central Plains as a whole, but 2) the sources of any one rock type are localized so that any given place may have one or a few important rocks, but not the full set of rock types that prehistoric people regularly used. Figure 3.1 shows the geological formations in or adjacent to the study area. We must, though, consider what rocks and minerals were necessary for prehistoric peoples, and where, relative to the CKRA, they could obtain these.

Chert, of course, was the rock most constantly needed by native peoples. Chert does not occur within the CKRA, but, as the name indicates, is abundant in the Flint Hills Upland to the east (Stein

2006). The Permian-age formations of the Flint Hills closest to the Salina area are not chert-bearing. The closest sources of chert, therefore, are a bit farther east, in eastern Dickinson County, adjacent Geary County, and beyond through the heart of the Flint Hills. Flint Hills cherts vary somewhat. A distinctive variety, usually called Florence A, appears at the south end of the region, especially in the Cowley County area. Other varieties grade into one another and it is impossible to try to associate them with too specific a location within the Flint Hills. The chipped stone tool assemblages from sites in the Saline and Ottawa counties area are dominated by Permian cherts, but they had to have been brought to the area either by going to a source and bringing back raw material, or exchanging something for this chert with people living in the source area. The arrangements varied as mobility strategies and social arrangements changed over time.

Another chert source that was used by people in the CKRA is the yellow-brown chert or jasper, variously known as Smoky Hill jasper or Smoky Hill silicified chalk, Republican River jasper, Niobrara jasper, and, uncommonly, Graham or Alma jasper. This chert, which will generally be called Smoky Hill jasper in this study, is formed in the uppermost Cretaceous formation, the Smoky Hill limestone. This formation is exposed to the west of the CKRA in Graham County and the surrounding area. It is present in assemblages from a smaller proportion of sites than is Permian chert and, when present, generally forms a smaller proportion of chipped stone objects. Overall, though, it may be the second most-common lithic raw material represented in the collection.

Other toolstones come from sources even farther to the west. These include various cherts, chalcedonies, and quartzites, sometimes from known source locations, sometimes probably from gravels redeposited at varying locations across the Plains. These miscellaneous materials are not well represented in the collections from the CKRA, with their best representation in assemblages from the sites of early hunter-foragers who may have covered large amounts of territory on their annual rounds. It might be noted that a couple of prominent toolstones that always seem to attract attention, including Alibates agatized dolomite, from the Texas panhandle, is very scarce in the Reed Collection and obsidian, from volcanic sources to the west, is represented by only a single flake from an early site. A single flake is identified as Knife River Flint. This material derives from a primary source area in central North Dakota and is very uncommon in Central Plains assemblages.

The position of the CKRA on the geologic succession may leave it with no chert outcrops, but, due to the prominence of the Dakota Formation in this area, sandstone outcrops are locally abundant. People with a stone tool technology could and did get along without objects made of sandstone, but the material is well-suited for making shaft abraders, metates, manos, and perhaps other objects and may be extensively used where available. The Dakota Formation sandstone is abundantly exposed in the uplands surrounding the study area. Sandstone is well-represented in the collections described in this study and in others from the same area. It was a commodity that could be given in exchange for cherts or other materials.

Other rock and mineral resources also are available in or near the study area. The Dakota sandstone contains small nodules or pockets of ochre that may have been used as pigment for various purposes. Salt is not often considered as a local resource, and is not directly recovered from archaeological sites, but it is one of those resources that is hidden in plain sight. Salt is a necessary nutrient. Hunter-foragers often obtained sufficient salt from consuming meat, but when agriculture came to play a role in the diet, as it did in this area just over eight centuries ago, it became necessary to add salt to foods and therefore also necessary to procure and process salt for this purpose. The presence of the Hutchinson Salt Member in the area has already been noted and the general salinity of the area is abundantly reflected in local place names such as Salina, Saline County, the Saline River, and Salt Creek. James R. Mead, an early Euroamerican settler along the Saline River, noted saline springs in the area (Mead 1986:103–104). We know nothing about how salt was procured in the area in the past, but presumably it was. We also ought to consider the possibility that salt, like sandstone, was a commodity that could have been used in exchange for necessary materials (mineral or otherwise) not locally available.

By sometime in the first millennium A.D., people in the CKRA were making and using pottery, so suitable pottery clay and material for tempering the clay to make pots became needed geological resources at that time. Cross-cultural studies show that traditional potters usually procure their clay from within 1 kilometer of their households and their tempering material from perhaps an even shorter distance (Arnold 1985:50). Clay can be found in many positions on the landscape, but not all deposits containing clay are equally suitable for pottery-making. Recent studies of the composition of pottery from the Salina/Ottawa counties area and somewhat beyond suggest that the pottery clays here usually were procured from alluvial sources (Beck 2001; Roper et al. 2007; Roper et al. 2010; Chapter 10, this study). Even then, some alluvial sources are better than others for pottery manufacture. Frequent river channel changes left numerous channel scars and oxbow lakes with topographic expression. These features often serve as wetlands, and accumulate dark organic-rich clays at the bottom of the swale. Very dark ceramic fabric colors and occasional hints of plant materials observed in pottery thin sections (Josephs 2008) suggest that these wetlands were an important source of pottery clay. Other potential sources of clay were stream channels or banks where slackwater may at times have led to clay accumulation. Upland depressions, or playas, may also accumulate clays, but these are an unlikely or at least lesser used clay source in the CKRA, both because playas are uncommon in this part of Kansas and because the broad valleys meant that the stream-side farmsteads lay a long distance from the uplands.

The provenance of pottery tempering material is somewhat uncertain, and procurement of this material likely was opportunistic. Petrographic analysis of selected sherds from CKRA sites suggests that the predominant tempering material is grog, and that coarse to very coarse quartz sand, limestone, and bone also are represented. Grog is crushed pieces of pottery. Essentially a recycled material, it usually would be available on a site, as would bone. Sand deposits probably were unpredictably dispersed across the landscape. The CKRA is just west of a notable sand sheet. The sand dune that holds the Whiteford site is an outlier of that sand sheet, suggesting that small sand deposits may have occurred sporadically in earlier times. Shell is another tempering material sometimes used on the Central Plains. Shell is abundant in assemblages from late prehistoric sites in the CKRA. Shell-tempered pottery, however, is absent from sites in the Smoky Hill and Saline river valleys, and it appears in quite low proportion in lower Solomon River valley sites (Roper 2011:272; Chapter 8, this study).

Clay, or other sediments with fine-textured particles in the mix, had another use in late prehistoric times, and this was in lodge construction. Contrary to popular notions, and as more fully discussed later in more depth, the late prehistoric people of the CKRA did not build and live in true earthlodges, but rather constructed wattle-and-daub structures. In this mode of construction, earth is not simply laid atop organic construction materials, either as loose earth or sod blocks, but rather is earth mixed with water to produce a mud, which is then packed into a woven framework of organic materials (cf. Van Beek and Van Beek 2008:161). The sediments used in mixing the mud, or daub, likely were obtained from the land surrounding the construction site.

Today, much of the broad expanses of river bottomlands in the CKRA are cultivated. This would not have been the case in late prehistoric times when the area was inhabited by people who were partially reliant on agriculture. Certainly the soils would have been as excellent for agriculture then as they are now, but the tough root system of the grassland cover was very difficult or impossible to cultivate with a bone or shell hoe and digging stick technology. Cultivation, therefore, likely was confined to the lower-lying ground within the river meander belts. Here, periodic flooding would afford natural tillage and close vertical proximity to the stream would have afforded natural irrigation for the crops. Individual garden plots would not have been large, but even the intensive agriculturalists of the historic period Plains Villagers averaged fields on the order of no more than a third of an acre to an acre per person (Will and Hyde 1917:108). The small patches in the meander belts would have provided ample acreage for individual family farmstead-based households practicing a less intensive agriculture.

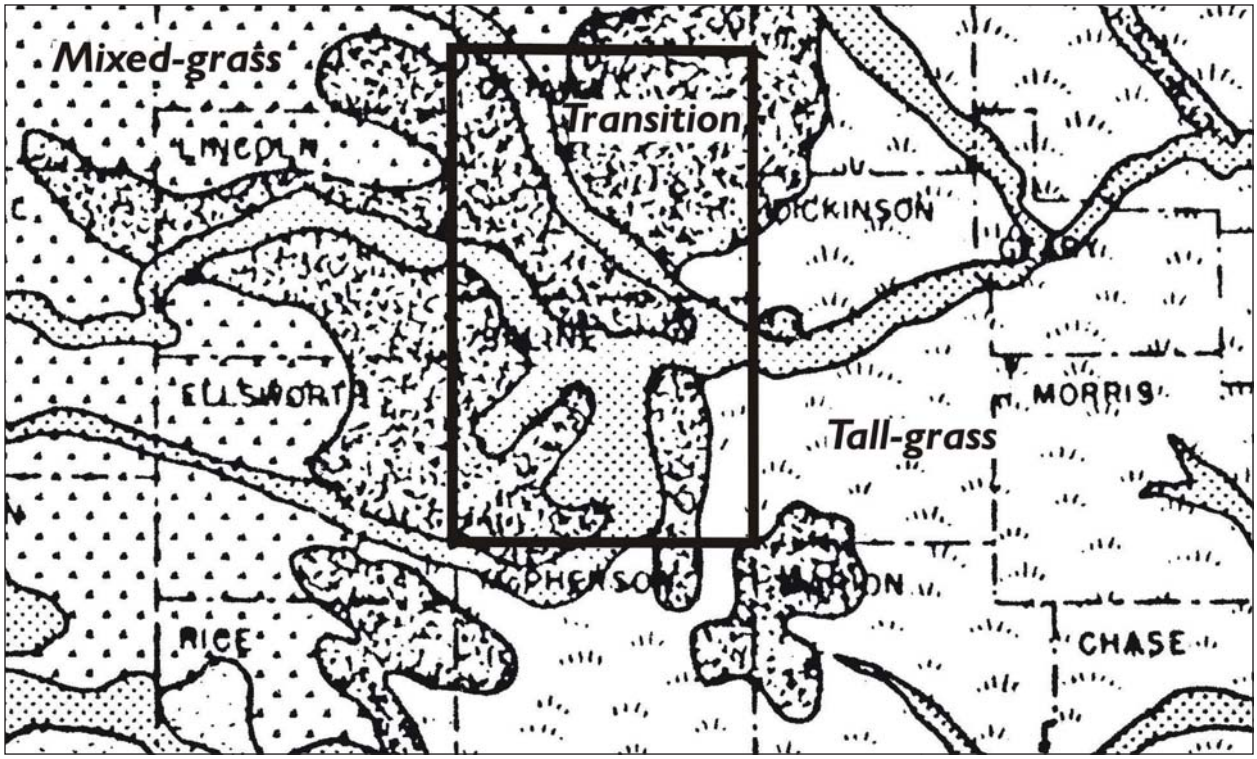


Figure 3.3. Biotic Setting of the CKRA

Biological Resources in and around the Central Kansas Riverine Area

Biologically, and in general terms, the Central Kansas Riverine Area lies near the transition from a tall-grass to a mixed prairie (Figure 3.3), a transition that is not sharply demarcated but rather is somewhat gradual (Kaul 1986:8; Küchler 1964, 1974). In prehistoric times, and probably throughout most of the human occupation in the area, the river bottomlands would have supported a tall-grass prairie dominated by big bluestem (*Andropogon gerardi*), intermixed with lesser quantities of little bluestem (*A. scoparius*), switchgrass (*Panicum virgatum*), and Indiangrass (*Sorghastrum nutans*). Other grasses and forbs appeared in minor quantities.

Overall, these grasslands would have yielded a somewhat restricted suite of edible plant foods. The main edible product of the prairie would be the prairie turnip (*Psoralea esculenta*), a staple that nevertheless is not a food around which a diet is focused. Greens and some grass seeds may have occasionally been used, and some of the shrubs of the grassland produce berries or leaves that were used for tea (a listing of these plants can be found in Roper 2006a:19). Wild onion (*Alium canadense*) may have been used to add flavor to certain dishes, and has been identified in organic food residue extracted from a sherd recovered at 14SA403 (Cummings and Roper 2010; it might be noted that organic residues from only a few sherds have been analyzed to date, so it is likely that further study will show a more regular use of this plant).

The diversity of edible foods would have increased closer to the farmsteads. Here, weedy disturbed-ground plants such as chenopod (lambsquarter, *Chenopodium berlanderi*), amaranth (pigweed, *Amaranthus graecizans*), sunflower (*Helianthus annuus*), and perhaps others may have been cultivated or they may have appeared on the disturbed ground surrounding lodges and other facilities of the farmstead. These plants produce copious quantities of nutritious starchy seeds and greens, and are documented as important resources in late prehistoric times (Adair 1988, 2003, 2006).

The wetlands in the swales and meander scars on the outer margins of the meander belts would have held some additional useful resources. Among these

would be cattail (*Typha latifolia*), the signature of which also has been found in food residue, this time from a sherd recovered at the Minneapolis site (Cummings and Roper 2010).

Some of the resources just enumerated would have had utility beyond that of providing food. Grasses have considerable additional uses, such as lining in storage pits, bedding, matting, or stuffing moccasins to provide insulation. These also could be used as a binder within architectural daub, helping to stiffen the clay. Grass impressions often are observed on large preserved pieces of daub. Additional ad hoc uses can also be envisioned.

The grassland was the primary vegetation association of the CKRA, but also important was a stream-lining timber belt. My assessment, based on a study of data from the General Land Office (GLO) surveys of 1858, is that timberlands were rather limited in extent, covering slightly less than 1% of the landscape, although presumably this fluctuated throughout prehistory. Their composition is that of a floodplain forest. Dominant species include hackberry (*Celtis occidentalis*), cottonwood (*Populus deltoides*), several willows (*Salix* sp.), and American elm (*Ulmus americana*) (Küchler 1974). Records from the GLO surveys also list oak (*Quercus* sp., species not recorded but probably bur oak, *Q. macrocarpa*) and walnut (*Juglans* sp., species not recorded but probably black walnut, *J. nigra*). A modern tree list for Saline County, derived from Stephens (1969), contains 28 species, including all of those listed above as dominants in this forest association. Understory in the woodland would include various vines (Roper 2006a:19; based on information in Stephens 1969).

In spite of their limited extent, the woodlands within the CKRA were a vital resource zone, not so much for plant foods, although some of those do appear, but as sources of raw materials. Perhaps chief among these was wood for fuel and for construction. Firewood was needed for multiple purposes, including heat, light, and cooking, and later for firing pottery. Woods vary in their heat value, but the list does include a number of species that make excellent firewood. Demands on wood for construction were particularly marked in late prehistoric times, as wattle-and-daub lodges were constructed to serve as the anchoring structures for farmsteads. Woods also varied in their suitability for this purpose, with strong, moisture-resistant woods such as oak and, to an extent, juniper perhaps being especially important for this purpose (in fact, though, we have very few species identifications for structural timbers from late prehistoric structures from this locality). In addition to dwellings, other structures present on farmsteads might have included such constructions as arbors and drying racks. Small branches might also have been used for lining pits—I once excavated a Central Plains tradition lodge in southwest Nebraska that retained a willow withe lining on the floor of one storage pit (Roper 1996:51–52) and it is reasonable to expect that this practice might have been common.

We know little about use of wood and woody products for tool manufacture, but the presumption that assemblages included wooden objects is no stretch. Spear shafts, dart shafts, arrow shafts, atlatls, and bows, if nothing else, would have been made of wood. It is possible that shafts for hoes or digging sticks also were of wood. We know that wooden bowls were used in historic period times but do not know how old that practice is. Wooden mortars also appear historically and we do not know how old that practice is either, although stone metates are found in this area and may have been preferred. Similarly, though, we can think of other objects that may have used wood, such as cradle boards, pipe stems, paddles for finishing pottery vessels, food stirrers, and other mundane objects.

The fauna of the study area also would have been diverse. Faunal associations tend to correlate with floral associations and with what Küchler (1970) called the Tatschl Line, a biological species range delimiter that runs north-south through Kansas. It is, to an extent, a species range delimiter for both animals and plants (Martin and Hoffmann 1987; see also the distribution maps in Bee et al. 1981). In general, the fauna of the study area included the bison (*Bison bison*), white-tailed deer (*Odocoileus virginianus*), wapiti (*Cervus elephus*), and pronghorn (*Antilocapra americana*), several of which now are extirpated. These large mammals were accompanied by a variety of medium- and small-sized mammals, including bear (*Ursus americanus*), coyote (*Canis latrans*), fox (*Vulpes* sp.), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), rabbits (*Sylvilagus* sp.), and squirrel (*Spermophilus* sp.). All these animals were found in grasslands and

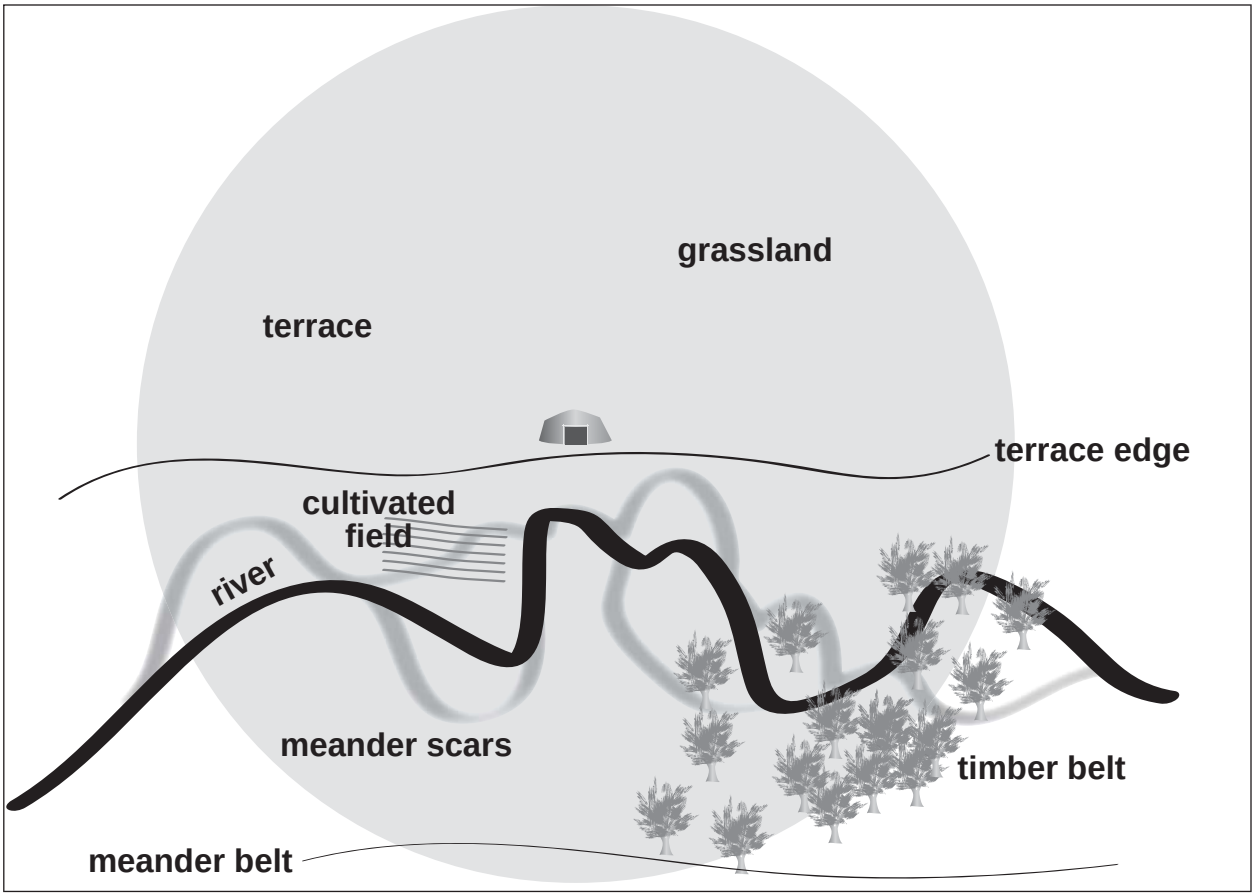


Figure 3.4. Hypothetical Setting of a Late Prehistoric Farmstead

interspersed woodlands. Stream-side locations were particularly important for the diversity of medium- to small mammals. These include skunk (*Mephitis mephitis*), raccoon, muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), squirrel, fox, and others (Bee et al. 1981).

Stream sides, not only along the rivers and tributaries but also, and maybe especially, along the oxbow lakes and channel scars, also were important for fish and freshwater mussels. The stereotype for the Plains that aquatic resources were not important is decidedly erroneous for the late first and early second millennium on the Central Plains. The adoption of these resources as dietary items is a key to the reduced mobility that characterizes this interval, and possibly also to the adoption of pottery, a crucial technology of the agricultural economy of late prehistoric times.

Birds are rather diverse in the project area. Game birds such as turkey (*Meleagris gallopavo*), prairie chicken (*Tympanuchus cupido*), and quail (*Colinus virginianus*) were particularly prominent economic species, as perhaps were various species of waterfowl. In contrast, reptiles and amphibians are not particularly diverse in the prairies; the box turtle (*Terrepene ornata*) probably is the most notable amphibian in the region. Fish and freshwater mussels are not particularly diverse, although they are reasonably abundant.

Animal food of many kinds was prominent in diets throughout the period of occupation in the CKRA. Diet breadth and the specific mix of species varied through time, however. Animal products included materials other than flesh. Bones are the class of materials best represented in archaeological context. Mammal and bird bones, as well as antlers, were used for manufacture of a variety of artifact types, such as scapula hoes, digging stick tips, flakers, awls, needles, fishhooks, beads, and other objects. Non-preservable parts of animal carcasses

undoubtedly provided hides, sinew, and feathers for arrows. Mussel shell also could be put to a myriad of uses, even if mussels themselves played little or no role in the diet. Beads and pendants are well-represented products of working mussel shell. My study of both the Reed Collection, as in later chapters in this book, as well as the collections made by the Whitefords (Roper 2001) from the same area, indicates that large ridged mussel shells greatly outnumber large mammal scapulae as materials for hoe manufacture in late prehistoric times. More modest-sized shells may have been used as spoons, although sometimes that attribution may be due more to an unfortunate desire to assign a function to everything within an assemblage and less to actual evidence for use. A further use of shell is for pottery temper. As already noted, though, shell temper is absent from assemblages in the Smoky Hill and Saline river valleys, and present only in small proportions in some Solomon River valley assemblages.

Implications for Settlement

The setting of the CKRA may be summed up in terms of the implications for human settlement. This discussion probably is most applicable to the settled farmstead-dwellers of the late prehistoric period. As later chapters show, they are by far the best represented cultural complexes in the Reed Collection, as well as other collections from the Saline/Ottawa counties area, but the principles are not completely inapplicable to the other cultural complexes. Figure 3.4 envisages the location of a late prehistoric farmstead in its characteristic position on the uneroded terrace surface, at its front edge near the interface with the outer edge of the river meander belt. Onto this location on a map is superimposed a 1 km diameter circle. Studies by geographers and ethnoarchaeologists (e.g., Chisholm 1968; Stone 1996) show that householders typically procure many of their resources from within this distance. To facilitate this, householders actually place their farmsteads in such a manner as to be able to procure the most critical and most staple resources from within this distance, recognizing that some resources will require traveling longer distances to either procure them or establish exchange relations with people in those resource areas. Looking at this 3.14 km^2 (1 km radius) area shows that it contains a rich suite of necessary resources. These include the dry land upon which to build, water, agricultural land, the resources of the stream, including fish, mussels, and river bank/point bar flora and fauna, pottery clay and possibly tempering material, timber for construction and fuel, and floral and faunal resources of the timber belt and its edge (prairie/forest edges often are rich in shrubbery and may be preferred habitats for various animals, including deer). Disturbed ground plants that are rich in edible seeds and greens may occur at various locations within this area, including around the houselot. The few resources from open grasslands should be nearby, or possibly available in at least small quantity within the 1 km radius.

A few important resources are missing within the 1 km radius. These include most of the rock and mineral resources (except clays) enumerated above and some large game animals, chiefly bison. It should be stressed, though, that contrary to the stereotype of the Plains, bison is not overly well-represented in local faunal assemblages and may not have been particularly heavily used by peoples in this area, at least by late prehistoric people. A second indicator of that may be the extensive use of large mussel shells rather than bison scapulae as hoes. With a limited exception to the east, this is the only part of the late prehistoric Plains that I know of where shell was substituted for bone in hoe manufacture. The most readily available of the rock and mineral resources, sandstone and salt, could have been procured within perhaps no more than a few kilometers of any site and probably were directly procured by people living in the CKRA. Chert, on the other hand, was available only at greater distances. Permian cherts could be directly procured no closer than about 50 km (30 mi) to the study area, while the primary source area for Smoky Hill jasper was no closer than about 100 km (60 mi). Others came from farther away. Direct procurement during long-distance forays was possible, but it also is possible that these resources were obtained by exchange, not necessarily because of distances, which are not major, but because they were in someone else's territory and were not free for the taking.

CHAPTER 4

Culture-History Framework

It is customary to begin accounts such as this one by describing the prevailing culture-history framework for the study area. It helps guide the reader through the remainder of the study, sets forth the terminology to be employed, and provides at least the general temporal parameters for the materials under study. For this reason, it is a necessary element of this book. It is presented in three parts. The first part traces some of the history of the development of the standard culture-history framework for central Kansas. Embedded within it is a brief explanation of the principles upon which designation of periods, phases, and so forth are based. The necessity for explaining these principles will become apparent by the end of the chapter. The second part of the chapter presents the standard culture-history framework and terminology commonly used in central Kansas and beyond on the Central Plains.

The third part of the chapter, however, presents an alternative framework and set of terms to be used in this book. This alternative emerged as the analysis of the collections proceeded and ultimately provided the organizing framework for everything in Chapters 6 through 12, which is to say for the chapters that form the heart of the book by describing, analyzing, and synthesizing the Reed Collection. In a sense this alternative framework is a conclusion to the study and the specific expression of it did develop late in the study. I found, however, that presenting it as essentially a result of the study of the collection led to terminological difficulties throughout the descriptions and analyses of Chapters 6 through 10 (a very large amount of text), and, worse, made it appear that Chapter 11, while seeming to deal with the same material as Chapters 6 through 10, was disconnected from them in some way. That way was terminology. Chapter 11 is very much connected to the earlier chapters, so the obvious solution was to present the alternative culture-history upfront, allowing me to write the remainder of the text in those terms. Importantly, it also means the narrative presented in Chapters 11 and 12, which are the real conclusions to the study, flow more seamlessly from the preceding descriptive and analytical chapters.

Development of the Standard Culture-History Framework for the Central Plains and the Principles upon which It Is Based

Culture-history frameworks often are presented as a time-space grid, which is to say, a chart in which dates are arrayed vertically, with the oldest at the bottom and the youngest at the top, and places are arrayed horizontally (e.g., Hoard and Banks 2006:4); if the concern is with a single place, then the chart has only one column. Dates normally are presented as rounded chunks of time expressed as intervals of either centuries or millennia and may be grouped by a succession of periods. Units within the grid cells of the chart are "cultures," often now designated phases, traditions, or foci.

As the format of a time-space grid reflects, periods and cultures, often expressed as phases, are not conceptually the same. A period is solely a unit of time, whereas cultures are units of material content, sometimes with and sometimes without temporal and spatial content as part of their definition. Periods in a chronological scheme may be expressed wholly in relative terms, which is to say in terms of what precedes what or what follows what, without any pretense that all periods are of equal length and sometimes without any dates assigned.. For example, the earliest sequence chart that was intended to cover Kansas, and then only north-central Kansas, was the very simple sequence Waldo Wedel (1934c:253) presented in 1934 (Figure 4.1), on which the time column on the left side of the chart read simply, from earliest to latest, "prehistoric," "protohistoric," and "historic" (Wedel 1934c:253; William Duncan Strong presented a similar chart for Nebraska [Strong 1935:2]). As knowledge of the archaeological record grew, however, periods were more finely divided. For

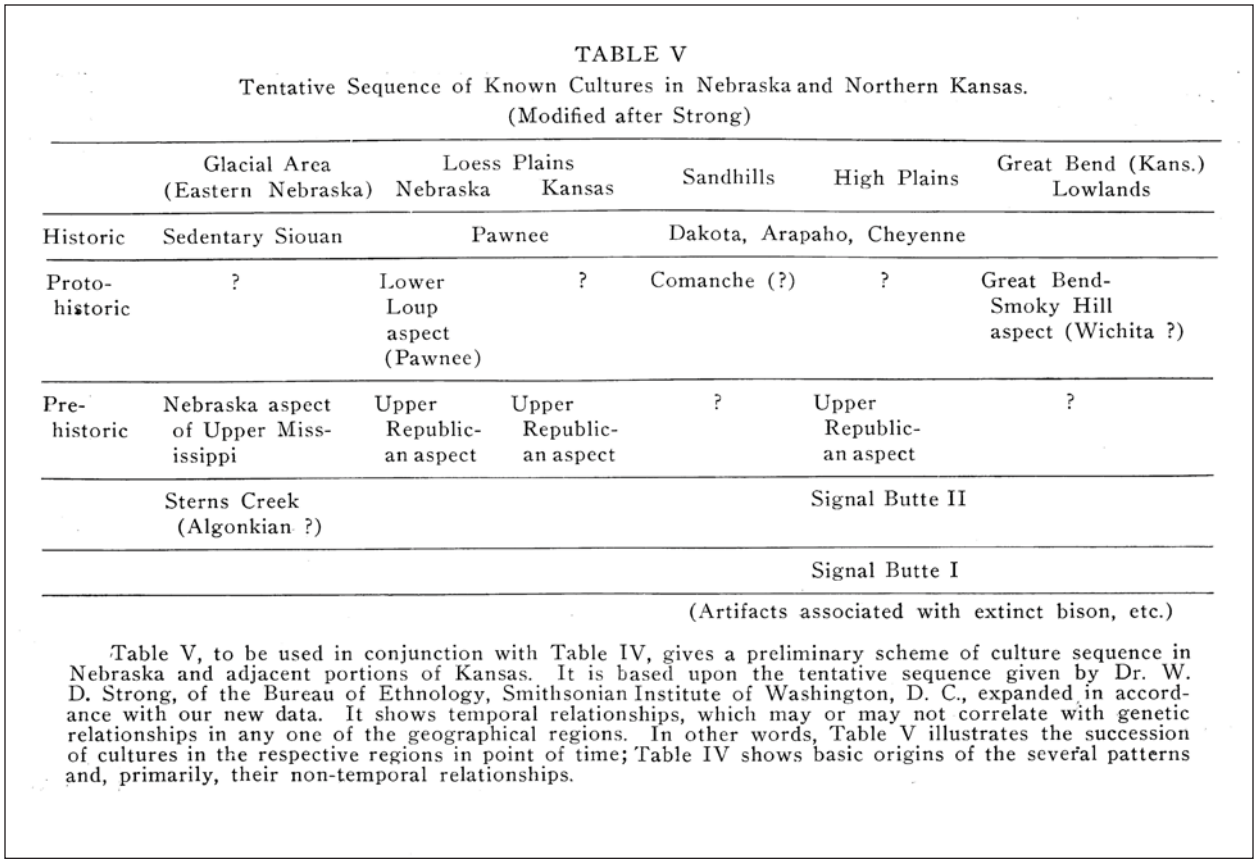


TABLE V

Tentative Sequence of Known Cultures in Nebraska and Northern Kansas.
(Modified after Strong)

	Glacial Area (Eastern Nebraska)	Loess Plains Nebraska	Loess Plains Kansas	Sandhills	High Plains	Great Bend (Kans.) Lowlands
Historic	Sedentary Siouan	Pawnee		Dakota, Arapaho, Cheyenne		
Proto-historic	?	Lower Loup aspect (Pawnee)	?	Comanche (?)	?	Great Bend-Smoky Hill aspect (Wichita ?)
Pre-historic	Nebraska aspect of Upper Mississippi	Upper Republican aspect	Upper Republican aspect	?	Upper Republican aspect	?
	Sterns Creek (Algonkian ?)				Signal Butte II	
					Signal Butte I	
					(Artifacts associated with extinct bison, etc.)	

Table V, to be used in conjunction with Table IV, gives a preliminary scheme of culture sequence in Nebraska and adjacent portions of Kansas. It is based upon the tentative sequence given by Dr. W. D. Strong, of the Bureau of Ethnology, Smithsonian Institute of Washington, D. C., expanded in accordance with our new data. It shows temporal relationships, which may or may not correlate with genetic relationships in any one of the geographical regions. In other words, Table V illustrates the succession of cultures in the respective regions in point of time; Table IV shows basic origins of the several patterns and, primarily, their non-temporal relationships.

Figure 4.1. Waldo Wedel's First Cultural Sequence Chart for the Central Plains

example, just over a decade after Wedel published this first sequence chart for the Central Plains, John Champe presented a Central Plains sequence with "time divisions" (periods by another name) of, from earliest to latest, Early Lithic, Intermediate Lithic, Early Ceramic, Middle Ceramic, Late Ceramic, and Historic (Champe 1946:85; reproduced here as Figure 4.2). He also assigned tentative calendar dates to these periods. Champe's period sequence has a descendant in the Kansas Prehistoric Archeological Preservation Plan, where six "temporal units" (yet another name for a period) are used to organize data: Paleoindian, Archaic, Early Ceramic, Middle Ceramic, Late Ceramic, and Historic (Brown and Simmons 1987:VIII–1). For some purposes, this terminology still is used in Kansas.

Within the boxes of a time-space grid are the cultural units defined for the study area. These may be called by various unit names, including culture, focus, aspect, phase, variant, or complex. The idea of calling a set of remains that take a coherence from one or more specific characteristics a "culture" has its roots in the early twentieth century and, on the Central Plains, the term can be found in studies from as recently as the 1930s (e.g., Strong 1935; Wedel 1934c). By the 1930s, it was apparent that the term was too vague to be useful for this purpose (e.g., Guthe 1932, reprinted in Lyman and O'Brien 2003:200), so a concerted effort was initiated to create a classification of cultures for mid-continental North America. The principles of what became known as the Midwestern Taxonomic Method (MTM) were established during that decade (McKern 1934, 1939, and a few related documents, most of which also are reprinted in Lyman and O'Brien 2003:199–279). The basic format of the method was to use a series of determinants, or traits, to achieve a hierarchical classification. In order from most specific to most general, the taxonomic units of this hierarchy were the *component*, basically a single occupation at a single site; *focus*, defined as components that have a "preponderating majority of determinants in common;" *aspect*, based on an "approximate majority of determinants in common;" *phase*, based on a

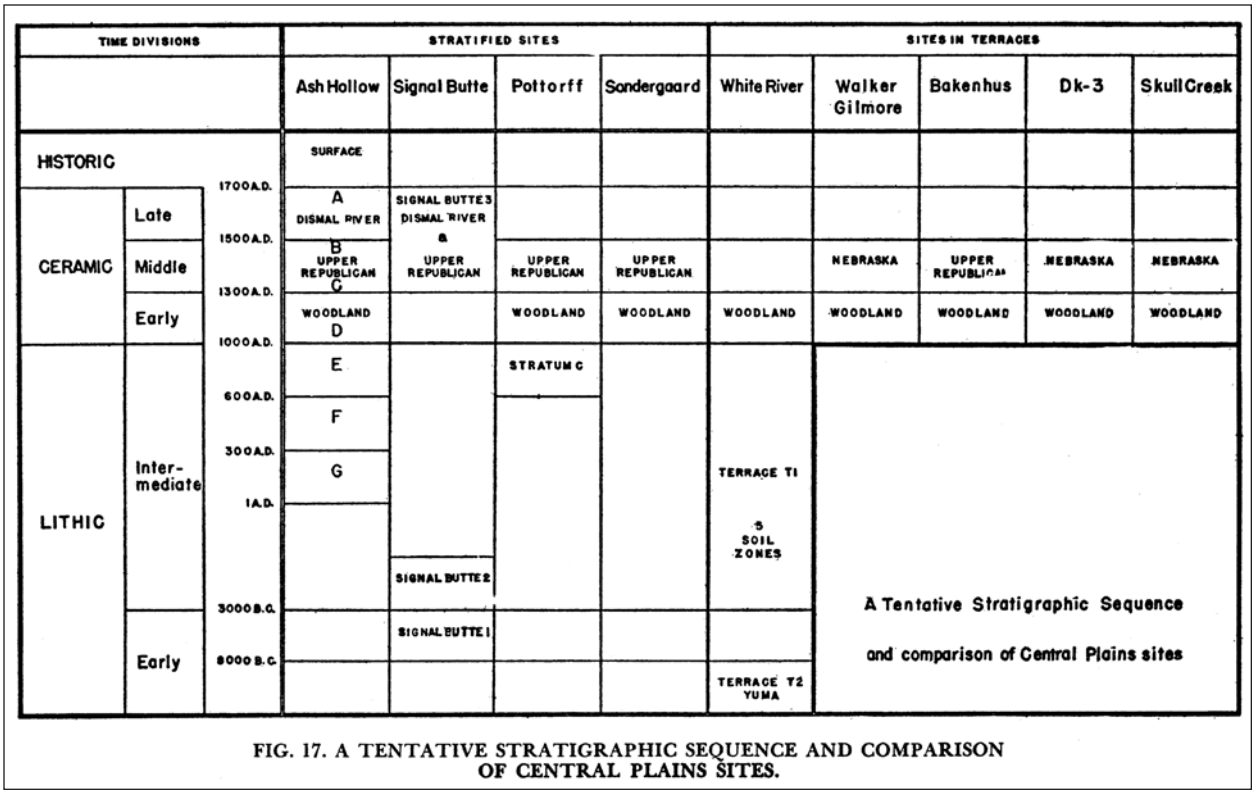


Figure 4.2. John Champe's Tentative Stratigraphic Sequence for the Central Plains

"significant, but minor, number of determinants in common;" and *basic culture*, later renamed *pattern*, based on a "relatively small proportion of determinants" (McKern et al. 1933; reprinted in Lyman and O'Brien 2003:212). We are familiar in Kansas with units defined in MTM terms, with, for the area of concern in this study, Great Bend aspect and the more specific Little River focus being the major taxa still identified using these terms. It should be noted that the concept of a phase in the MTM is not the same as it is in current common usage, as for example the Smoky Hill phase. This is further discussed below.

William Duncan Strong, then at University of Nebraska, was not heavily involved in the development of the MTM, but did participate in a limited role as a correspondent with W.C. McKern (from the Milwaukee Public Museum), who was leading the effort. Strong brought the MTM to the Central Plains as the method was being formulated, proposing a classification of Nebraska cultures in a Foreword to his *Introduction to Nebraska Archeology* added just before the book went to press (Strong 1935:1–2). About the same time, Wedel (1934c:252) presented a classification similar to Strong's, with Kansas materials added (Figure 4.3). In considering these classifications, it is important to recognize that MTM units were content units only, which is to say, time and space played no role in their definition. Thus, the classification chart Wedel presented simply showed the component–focus–aspect–phase–basic culture hierarchy and was entirely independent of space and time.

Strong and Wedel, however, were each as interested, perhaps even more interested, in developing cultural sequences as they were in developing cultural classifications. Thus, each paired their classification charts with the sequence charts cited and reproduced above. Here is where they listed periods down the side of the chart, areas across the top, and, assuming data were available to do so (as they were not always), filled in the boxes with the names of cultural units, usually expressed at the level of aspect (Figure 4.1). In a sense, later time-space charts for the area represent a continuation of that practice.

How cultural units are defined, at least in North America east of the Rocky Mountains, was modified beginning in the 1950s. In that decade, Gordon

TABLE IV. Suggested Classification for Known Nebraska and Kansas Cultures.

Basic Culture	Phase	Aspect	Focus	Component
Mississippi	Upper Mississippi	Nebraska	Omaha	Rock Bluffs, Gates, Saunders, Walker Gilmore (II), etc.
			St. Helena	St. Helena, Butte, etc.
	Central Plains	Upper Republican	Hastings	Bladen, etc.
			Rose Creek	Rose Creek, Mill creek (Kan.), etc.
			Lower Solomon (Kansas)	Minneapolis 1 (Kansas), etc.
			Munson Creek	Lehn, etc.
			Sweetwater	Sweetwater, etc.
			North Platte	Signal Butte (III), etc.
			Medicine Creek	Medicine creek 1-4, etc.
			Lost Creek	Dooley site; Holdrege 3, 4, etc.
		Lower Loup (Protohistoric Pawnee ?)	Beaver creek	Burkett, Schuyler, etc.
		Lower Platte (Historic Pawnee)	Columbus	Horse Creek Fullerton, Genoa, Central City, Palmer, Linwood, etc.
			Republican	Superior 1 (Hill site), Concordia 1 (Kansas), etc.
	?	Smoky Hill-Great Bend	Paint Creek	Salina 1, sites on Little river and Cow creek, etc.
			White Rock Creek (?)	Beloit 2, sites on White Rock creek (Kansas), etc.
	Woodland	Ia. "Algonkian"(?)	Sterns Creek	Walker Gilmore I
Great Plains	Early Hunting	Signal Butte II (?)	Signal Butte	Signal Butte II
		Signal Butte I	Signal Butte	Signal Butte I
		Folsom (Colo.)	Northern Colo.	Lindemeier Site (Colo.)

Figure 4.3. Wedel's First Cultural Classification Chart for the Central Plains

Willey and Philip Phillips at Harvard offered what they called "an operational basis for culture-historical integration" (Willey and Phillips 1958:10–57). They defined various levels of spatial divisions and kinds of temporal series, but also set out two "basic archaeological units": the *component*, conceived in a manner identical to that of the component in the MTM, for, as they noted, it is "a useful term which has achieved nearly universal currency in eastern North American archaeology"; and the *phase*, defining it as "an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, . . . spatially limited to the order of magnitude of a locality or region, and chronologically limited to a relatively brief interval of time" (Willey and Phillips 1958:22). This conception of a phase is different than it is in the MTM, and Willey and Phillips (1958:22) noted that in their conception, a phase is "approximately equivalent" to the focus level of the MTM, although with time and space now not independent of material content. This solved an issue with the MTM that Thorne Deuel, another active participant in the development of the MTM, identified in what now can strike us as an almost hilarious passage where he admitted that since that method relied entirely on content and defined types of culture, "a component in Siberia having a preponderating majority of determinants in common with the Black Sand Component (Woodland) of Illinois, though it might evoke considerable skepticism[!], would—if satisfactorily demonstrated—be placed in the Black Sand focus of the Central Basin phase" (Deuel 1937, in Lyman and O'Brien 2003:229, bracketed exclamation point added). In fact, though, Deuel also noted that "[W]e have a feeling in anthropology that cultures do not exist over long periods of time without readily distinguishable changes in traits. Hence, if the cultural traits of two components overlap to such a degree as to be 'almost identical,' they are assumed to be contemporaneous" (Deuel 1937; reprinted in Lyman and O'Brien 2003:229).

How right he was. It is no real surprise, therefore, that many defined phases in current use in Central Plains archaeology are either foci that could be and have been successfully reworked to and redefined as phases, or phases that were defined as such since the Willey and Phillips method came to dominate how culture-history taxa were defined. Thus, except in the few cases where a focus or aspect lingers in common usage and appears on standard time-space grids (as with the Great Bend focus), the cultural unit names appearing in most grid blocks now are phase names in the Willey and Phillips system sense.

Willey and Phillips also proposed several integrative units, again based on time, space, and content. The two units pertinent to this discussion are the *tradition* and the *horizon*, the former of which is familiar to us on the Central Plains, the latter of which is not. As Willey and Phillips (1958:33) defined it, the horizon is a "primarily spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permits the assumption of a broad and rapid spread" and whose units are "assumed to be approximately contemporaneous." If this sounds familiar, it should. But first, in Willey and Phillips' conceptualization, a tradition is "a (primarily) temporal continuity represented by persistent configurations in single technologies or other systems of related forms" (Willey and Phillips 1958:37, parentheses in the original). Thus, also in Willey and Phillips' words, "the tradition gives depth [time], while the horizon gives breadth [space]" (1958:38, bracketed words added).

We are familiar with the term tradition because of the use of the important cultural taxon, the Central Plains tradition. Donald Lehmer defined this tradition in a formulation published in 1954 (Lehmer 1954:139–154). Here, he named the Central Plains tradition as one of three major cultural traditions of the late prehistoric/early historic central and northern Plains. His main concern in that study was with sites in the Missouri River valley of South Dakota, so he did not elaborate on his formulation of the Central Plains tradition other than to indicate a list of sites (i.e., components) that were assignable to it. These included sites that Strong and Wedel earlier had assigned to foci and aspects of a Central Plains phase (in the MTM sense) and that we now place within phases of the Central Plains tradition. But, of course, these phases are overall largely contemporaneous, occupy a rather small amount of time, and cover a large area, so the Central Plains tradition really is not so much a tradition as it is a horizon. Lehmer's study is the publication of his Ph.D. dissertation, written at Harvard where Willey and Phillips were developing their method when Lehmer was one of their students. I have not been able to find any evidence that this was a deliberate trial of their method, and Willey and Phillips do not cite it in their book, nor does Lehmer mention it, but it seems reasonable to think that their early formulations of it may have, even must have, influenced Lehmer's work. Why he named these Plains units traditions instead of horizons, however, seems a mystery.

Two other terms sometimes used in cultural taxonomies and time-space charts are *variant* and *complex*. Lehmer introduced the concept of a variant in a 1971 book synthesizing the archaeology of the Missouri River valley in the Dakotas. He defined variant as "a unique and reasonably uniform expression of a cultural tradition which has a greater order of magnitude than a phase, and which is distinguished from other variants of the same tradition by its geographic distribution, age, and/or cultural content" (Lehmer 1971:32). In other words, a variant is a kind of unit lying between phases and traditions (as Lehmer uses the term) and that subsumes several phases. The term is not prominently used on the Central Plains, but it does appear in documents, such as the prehistoric archaeological preservation plan for Kansas (Brown and Simmons 1987). As used in these instances, however, it contains no phases within it. My own opinion is that in strictly culture-history classification terms, it is the more appropriate term for what are routinely called phases, and each of these variants should have several phases within it. The alternative I will use later in this chapter, however, uses neither.

The final term, complex, is used only sparsely in regional taxonomies. It is a somewhat informal term that generally is applied in situations where material culture similarity is recognized among two or more components, but where the details are not well enough known yet to warrant a formal phase definition (sometimes they probably are well-enough known but no one has done it). It is most commonly applied to early cultural units that still are known only from sparse evidence.

Standard Culture-History Framework

The current archaeological culture-history framework in common usage for much of Kansas is, to be candid, something of a hodge-podge of periods, phases, sometimes variants, foci/aspects, complexes, and traditions. The danger in presenting it is that it can make it appear that the chronology is well-established, that dates have a solid foundation, that chronological units are meaningful, and that materials can and should be plugged into that framework to produce a narrative. This simply is not true, and the entire system is seriously in need of revision. In fact, the study of the Reed Collection, along with work I have done with ceramics from the CKRA and elsewhere on the Central Plains, and my recent excavation in the Little Arkansas River valley a short distance south of the CKRA (Roper 2008c), point up how urgently true this is for central Kansas. However, the chronological framework is graphically presented in black and white or even in color in books (Hoard and Banks 2006:4), reports, and popular media such as information brochures, and is a part of the common working lexicon of archaeologists throughout the state. I therefore outline it here to provide that common working vocabulary, but caution the reader that I do not ascribe to it the social reality that is so often attributed to it, nor view it as useful for understanding culture change. It is, therefore, just a set of familiar words that have a rough correlation with a set of object classes but that has no explanatory value. In fact, I think it inhibits constructing accounts of cultural dynamics on the Central Plains.

For purposes of this discussion, only the chronological framework for central Kansas is discussed, although many units are more broadly applicable. Thus, the time-space grid as presented by Hoard and Banks (2006:4, 8) has multiple rows, but really only a single column if we extract the part applicable to the region. This approximates what Willey and Phillips (1958:24–25) called a *local sequence*, i.e., a succession of components or phases in a local area. As with all of the Kansas chronology, the rows of this column are anchored by periods, traditionally Paleoindian, Archaic, Ceramic, and Historic, with the Ceramic period divided into Early, Middle, and Late periods.

Paleoindian and Archaic taxa generally are what archaeologists often refer to as "projectile point cultures," which is to say cultural complexes whose diagnostic artifacts are specific projectile point types, and that are defined as the material culture assemblage associated with that point type. These units often are even named by the point type. Whether a specific point type really identifies the people of a particular culture can be, and is, debated (e.g., McElrath et al. 2009), but archaeologists find continuing utility in using this criterion for assigning components to cultural units and defining cultural sequences (e.g., many of the chapters in Emerson et al. 2009). In view of the relative paucity of information about the various cultural complexes, there is little choice at this time but to continue this practice. Cultural units that traditionally are part of the Paleoindian period are defined by specific types of lanceolate points. Clovis, followed by Folsom, are the earliest known and often the most discussed point types/cultural units, but in the traditional taxonomy they are followed by a succession of other, unfluted, lanceolate point forms. These formerly were sometimes grouped into what was called the Plano tradition, but that designation is no longer used, and the collective term Late Paleoindian is substituted. If we are learning anything about Paleoindian regional variation, however, it is that after Clovis, which is expressed over a wide area, we begin to see regional differences in the distribution of lanceolate point types, with first Folsom and then the traditional unfluted lanceolate point sequence being more appropriate on the High Plains than on the eastern part of the Plains. These forms are followed by a variety of side-notched, corner-notched, and stemmed points that traditionally have defined the Archaic cultural units. On the eastern part of the Central Plains, however, Dalton points succeed Clovis and then give way to a succession of Archaic side-notched, corner-notched, and stemmed points that initially are more evocative of types from the Southeast than of the High Plains, and later are more localized to the eastern Plains and sometimes the surrounding area. Some of this is practically moot for central Kansas, however, due to the extreme scarcity of Paleoindian and Archaic sites in this part of the state.

Far more important to this study, since the majority of the materials considered here pertains to it, is

the Ceramic period. As already noted, this usually is divided into the Early (A.D. 1–1000), Middle (A.D. 1000–1500), and Late (A.D. 1500-into the 1800s) periods. The first two of these, the Early Ceramic period and the Middle Ceramic period, are particularly pertinent. In a very real sense, the initial formulation of these three periods is due to Champe's study, cited earlier, of the cultural stratigraphic succession at Ash Hollow Cave, in the North Platte River valley of western Nebraska (Champe 1946). Although the specific cultural units Champe discussed, almost all of them considered phases, are not applicable in much of Kansas, the concept of these three ceramic periods has been adopted in the state. It has outlived its usefulness, but that is another matter.

If Paleoindian and Archaic cultural units are projectile point cultures, the cultural units within the ceramic periods are pottery cultures, although they are not named by pottery types. Historically, most of the phases assigned to the sequential periods were initially recognized at a specific site or sites and a cultural unit (often initially a focus) was defined on the basis of the remains from those sites. Site reports such as those by Wedel (1934a) for the Minneapolis site or the Paint Creek site (Wedel 1934d) are examples. The similarities among components assigned to the various foci/phases/"cultures" and their distinctness from other units often was very explicit in the pottery. Hence, separate cultural units were named and were extended as new components with similar pottery were identified. Their correlation with defined periods is a relic of the Champe sequence, as adopted in Kansas.

Cultural expressions of the Early Ceramic period are those that traditionally have been called Woodland. Just to complicate matters, the Woodland tradition is sometimes talked about in terms of Early, Middle, and Late periods. This is because the term Woodland was borrowed from the Midwestern states, including Illinois and Missouri, where a formally designated Ceramic period is not used, and Early, Middle, and Late Woodland are designations for divisions of the interval of time from about 500 B.C. to A.D. 1000 (e.g., Hoard and Banks 2006:8). It is pertinent to mention this because these terms sometimes are used in Kansas, most particularly in the easternmost part of Kansas where ceramics bear considerable resemblance to materials from Missouri and Illinois.

Leaving this aside, though, Woodland cultural units initially were defined by the adoption of pottery, although we now know that is not necessarily valid. Indications from throughout eastern Kansas are that pottery was not everywhere simultaneously adopted—that sometimes it appeared in Archaic times and, conversely, that it may have been well into the first millennium before it was adopted. This latter apparently is the case in central Kansas. The Woodland sequence for the Saline/Ottawa counties area actually is not well known, however, nor are the temporal parameters at all certain. Some radiocarbon dates in the A.D. 200s or 300s or so have been obtained in the nearby Republican River valley in Clay County and vicinity, but dates from Woodland components in the CKRA are entirely lacking (Adair 2013). Thus, applicability of the standard Early Ceramic period temporal parameters of approximately A.D. 1 to 1000 is unverified and, if I could hazard a projection, almost certainly not accurate as a general statement for this specific area (I know the "ending" date of A.D. 1000 is inaccurate, I can only suspect the "beginning" date of A.D. 1 is inaccurate). Still, several pottery classes and a succession of projectile point styles are recognized and likely reflect the passage of time, suggesting that these earlier pottery-using people were using the area for minimally several centuries in the latter part of the first millennium—in fact, if we were to use the Midwestern terms, we would recognize very small amounts of Middle Woodland and greater amounts of Late Woodland remains in the CKRA and nearby.

In the standard chronology, the Middle Ceramic period is the time of the most prominent cultural expression of the CKRA, viz., the Smoky Hill phase. Floyd Schultz, from Clay Center, excavated a number of these sites, most of them in the Republican River drainage, in the 1920s (Hawley 1993). The first excavations of Smoky Hill phase sites in the CKRA were those conducted in 1934 at the Minneapolis site, directed by A.T. Hill and reported by Waldo Wedel (1934a). Over the years, they have been followed by other investigations conducted by a succession of archaeologists (Chapter 2, this study). The phase was named by Wedel in his 1959 *Introduction to Kansas Archeology*. By that time, work had been conducted not only in Saline and Ottawa counties, but also in Riley County, at the Griffing site (14RY21)

along Wildcat Creek near Manhattan. The Riley County site yielded remains that, while not identical to those from Saline and Ottawa counties, were at least similar enough to warrant grouping them at some level. Accordingly, still using the principles of the MTM for classifying and naming cultural units, Wedel (1959:563) defined a Smoky Hill aspect, with two foci, the Saline focus and the Manhattan focus. The Minneapolis site and the Whiteford site (the Indian Burial Pit) were jointly the type sites for the Saline focus. Note that what Wedel did here was define Smoky Hill on the basis of an approximate, but not preponderate, majority of traits held in common, which is to say as an aspect, not the focus that, as Willey and Phillips noted, is approximately the equivalent of the phase in their method. The two focus designations never gained currency in common usage and at some point the aspect was converted to a phase in the Willey and Phillips sense, a move that in a real sense ignores and collapses the variation among components over a larger area that Wedel obviously recognized. In this sense, the conceptualization of Smoky Hill as a variant (Brown and Simmons 1987:XVIII-8–XVIII-15) probably is more appropriate. The problem is that a variant has phases within it and no phases have been defined within a Smoky Hill variant. Study of the pottery from over a large part of the region associated with the Smoky Hill phase indicates that if one wished to continue using the standard taxonomy there would be a distinct basis for defining phases within a variant, using not only content but, correctly, temporal and spatial data.

Radiocarbon evidence for sites assigned to taxa within the Middle Ceramic period do in fact fit within the temporal parameters of the period (A.D. 1000–1500). In standard usage, these would be taken to be applicable throughout the phase and to connote a several century occupation by Smoky Hill phase people in the CKRA. In actuality, as will be shown later in this study, neither of these suppositions is correct.

The standard chronology assigns several other cultural units to the Middle Ceramic period. These, however, are not represented in the collections addressed in this study. Nor are Late Ceramic period materials represented, or at least not represented by more than a possible occasional artifact. In general, the Late Ceramic period correlates with the time of the Little River focus of the Great Bend aspect and later village peoples of the Central Plains. This major expression, the Quivira that Coronado entered in 1541, is represented at village sites in northern McPherson County and especially in adjacent Rice County, thus near, but not in, the present study area. Finally, Historic period (post-1800) native sites do not appear in the CKRA. There is a documentary reference to a nineteenth century Kansa (Kaw) site in the Smoky Hill River/Saline River confluence area (reproduced in Barry 1972:94), but no remains of such a site have ever been found. The intense activities of Harold Reed and, earlier, the Whitefords and the Stauffer brothers in this very specific area, would have had a good chance of locating any such remains if they were present.

Alternative Culture-History Framework

Having presented the standard culture-history framework, I now reject it for use here, or at least I reject its terminology, certainly its parameters, and perhaps even some of its conceptual foundations. I do this because in organizing the materials described in this book, as well as in synthesizing the results of the description and analysis of materials in the Reed Collection, I found periods frequently misunderstood and wrongly used, in part because they are very artificial. As shown in the first part of this chapter, periods conceptually are intervals of time and nothing else. Yet in the standard culture-history framework for eastern Kansas, the Ceramic age periods are, in much common discourse, used as if they had cultural content as well. But as we have seen, this is a clear violation of the principles of forming chronologies and taxonomies. Worse in practical terms, however, using the terms as if they had cultural content simply leads to considerable inaccuracies.

This is exacerbated because the temporal parameters are wrong, and they are wrong on two counts. One is that the stated intervals are based on radiocarbon dates, but on the radiocarbon dataset as it existed some decades ago. That dataset was limited in extent, and, we now know, contained many erroneous and misleading age determinations. Because it was based largely on dates run on wood charcoal, the samples often are old wood and the resultant

dates are older than the actual date of the occupation. Use of periods in this manner also suggests that all complexes were exactly contemporaneous with one another and of the same duration. This makes it conceptually impossible to evaluate cultural dynamics within a given period. Further, because many radiocarbon age determinations have large standard deviations, using them collectively to delimit periods incorrectly states the durations of the cultural complexes assigned to the period. The particulars of the radiocarbon calibration curve for this interval exacerbates that because the curve exhibits a plateau in approximately the first two centuries of the second millennium A.D. The net effect of all this is, as we shall see, that the dates of various temporal complexes are grossly overstated. The ability to discuss historical process is vastly diminished as a result.

I also reject the standard phases, because they carry too much baggage and connote things we need to abandon. The traditional temporal assignments, based on the radiocarbon dataset, as already discussed are not correct. The implication that the phases, particularly the so-called Smoky Hill phase, have a social reality, is wrong, and is compounded by the equation with an historic tribe, an attribution that also is wrong and has been sorely abused over the decades. There is no modification of the traditional names by stating how I use them that can overcome this—once a traditional name is assigned, it is not a connotation but a denotation of a specific set of parameters, and it will always carry that denotation. Indeed, under the rules of naming complexes, the names for them must continue to denote the contents laid out in their formulation. The alternative is to discontinue their use and adopt an alternative set of terms. That is what I will do here.

I should not, however, suggest that I am going to simply employ a new set of terms for periods and phases. Instead, individual sites are placed into one of three groups. The division does have a temporal basis, but the division is fuzzy, not rigid. The names I use imply that and the groups are presumed to be largely sequential. For only some of them do we have good actual calendar dates, so although I suggest some general temporal parameters, low precision usually is implied. These approximate dates should remain that way until valid radiometric dates are obtained. The groups also have cultural content (and since this is defined for this area only, space is both a constant and implied), but it is general. Two of the three groups have divisions that are based on what is observed in these and other collections from the area. In organizing phenomena this way, I do not wish to imply that I am proposing a new culture-history framework to be indiscriminately applied to a larger area. It pertains only to this area. Importantly, though, as will be seen in Chapter 11, it will permit me to tell a historical narrative in which people are the actors, coming and going, innovating and causing modifications in their culture (material and otherwise), on a schedule that is not the abrupt modifications implied by the period and phase taxonomies and may not be simultaneous throughout even this limited study area, but that goes with the flow of time and is situated within the prevailing circumstances.

The three groups of sites I will define are here designated *Paleoarchaic*, *Intermediate*, and *Late Prehistoric*. A protohistoric village group is represented nearby, although at the barest minimum in the study area, and is implied. Definitions of each of these groups follow.

Paleoarchaic

The use of the term Paleoarchaic for what traditionally is termed Paleoindian and Archaic retains a name already in use in the area. The term was first applied in Nevada and surrounding area in the Great Basin. Blackmar and Hofman (2006), writing in the current synthesis of Kansas archaeology, recognize the reality reflected in the archaeological record that Paleoindian people, long seen has having focused on hunting large, now extinct, animals (mammoth or older forms of bison), also sometimes concentrated on other resources, while Archaic people, classically construed as foragers using smaller resources, also extensively used large game (principally bison). Thus, Blackmar and Hofman's choice of the term Paleoarchaic, which "makes no assumptions as to whether they represent specialized big game hunters, localized foragers, or some combination of both" (Blackmar and Hofman 2006:49). That approach is consistent with mine in this study, for, in truth, we have minimal direct evidence, none of it from exca-

vation, as to whether local peoples were hunters, foragers, or hunter-foragers.

Blackmar and Hofman assign their Kansas Paleoarchaic the temporal parameters of approximately 11,500 to 3000 radiocarbon years ago (approximately 13,500 to 4000 calendar years ago). I agree with the beginning date, since it really is conceived as the apparent time of the first peopling of the area (although that probably locally was somewhat later), but suggest, for at least the CKRA (and probably some of the surrounding area), that it extends to more near 2000 or even fewer calendar years ago.

The Paleoarchaic of the CKRA needs to be divided into two smaller groups, again with temporal connotations. One of these extends from the first peopling of the area to about 4000 years ago, when the Altithermal, a several millennia-long warm and episodically dry climate interval, ended. Evidence of occupation just before and then during the Altithermal is not entirely lacking in the CKRA, but is very sparse and, by far, this is the most poorly represented of all site groups identifiable in the CKRA.

The end of the Altithermal and establishment of a post-Altithermal climate and biological regime throughout the Plains is marked by major cultural changes. This, as we will see in Chapter 6, is the case in the CKRA as well. As attested in the Reed Collection (and probably other collections from the area), it really is during this time—even an approximate time cannot be established in the absence of radiocarbon dates—that the area was first colonized by people. Evidence in the CKRA is reasonably abundant, particularly relative to what came before it, but it is spatially very restricted within the area. On the other hand, the evidence, particularly a succession of projectile point types, suggests persistent use of the area, particularly, as we will see, one part of it, for some centuries, or possibly even a millennium or two. These changing types do not necessarily represent different "cultures" or groups of people so much as an enduring, but fluidly organized, population of hunter/foragers, who periodically entered and possibly sometimes aggregated in the area. The cumulative record thus reflects these people consistently adjusting their diet and modifying their technology accordingly.

Intermediate

Those sites I assign to an Intermediate group probably date to the second half or so of the first millennium and the early centuries of the second millennium A.D. In the absence of any radiocarbon dates for these sites, though, that has to remain an imprecise supposition based on cross-dating from elsewhere and on the *terminus ante quem* posed by the radiocarbon dates for the Late Prehistoric site group.

There is no reason to think other than that the lifeway of this interval represents a continuation of the already centuries-long process of expanding the diet, introducing technological innovations, and adjusting land use practices. Projectile point types continued to change and it was during this interval that the bow and arrow was introduced, apparently quite thoroughly replacing the dart or spear as a hunting weapon. Pottery also was introduced during this interval. The area still was used on an intermittent, possibly seasonal, basis rather than year-round, which is to say, the entire settlement system prevalent in the broader region is not represented in the CKRA at this time. Peoples in what is now eastern Kansas were beginning to practice a limited agriculture, but evidence for such in the CKRA is entirely lacking and it appears that the area was used for periodic, possibly seasonal, procurement of specific resources. CKRA sites in this group are found over a larger part of the area than were earlier sites. The most consistent, virtually exclusive, setting in which these sites occur is next to oxbow lakes/old river channel scars. Along with the nature of the remains from these sites (described in Chapter 7), this location preference suggests that this area was entered to procure resources such as freshwater mussels, fish, and perhaps other aquatic/wetlands resources, such as plants that could be used for making basketry or netting. Agriculture and other procurement activities were conducted elsewhere. At the present, though, we do not know where these specific groups were spending their time when they were not in the CKRA.

Late Prehistoric

By around the middle of the 1100s, according to the evidence of the best currently available

radiocarbon dates, agriculture in the general region was somewhat intensified and people began living in the CKRA year-round, practicing agriculture from small farmsteads spread throughout the valleys of the Smoky Hill and Solomon rivers, but not the Saline River except for its lowest end where it shares a valley with the Smoky Hill River. This likely occurred as part of the long-standing process of adjusting diets and land use practices. Thus, rather than representing the arrival of a totally new people in the area, the evidence strongly indicates this as a time when people who formerly entered the area only periodically, or seasonally, and who already were familiar with it, settled in it year-round, built planned, durable domestic structures, and intensified their practice of agriculture so that it became a staple, if minority, part of what still was a diverse diet—probably the most diverse diet of the entire prehistoric interval on the Central Plains.

The evidence from the Reed Collection, particularly in combination with evidence from the surrounding area, indicates, however, that the cultural developments of this interval were far from uniform throughout even the CKRA. Thus, the evidence indicates that it is necessary to subdivide the Late Prehistoric site group of the CKRA into three subgroups. Place, not time, is the organizing variable here. Accordingly, I have designated these site groups as the Lindsborg locality, the Salina locality, and the Minneapolis locality. All fall in the interval of time from around the mid-1100s to the latter decades of the 1200s, but it must be emphasized that these three groups, while at least partially overlapping in time, do *not* necessarily have the same chronology, in terms of either their time of occupation or the duration of the occupation in their locality. It also is very clear that these localities had individual histories, varying external connections, and potentially varying social organization. The evidence is strong that the households of the Salina and Minneapolis localities, in particular, were organized into small communities and functioned accordingly. Even then, however, the two communities may have been differently constituted. All this is overlooked by assigning these sites to a single cultural taxon and treating them as a unity.

This Late Prehistoric occupation of the CKRA was surprisingly short-lived, lasting not more than, and possibly even less than, a century, according to current radiocarbon dating evidence. The CKRA then has, for all practical purposes, no substantial archaeological record of any kind until the arrival of Euroamericans in the mid-nineteenth century. In other words, the protohistoric villagers, such as represented at sites in the Little Arkansas River and Cow Creek valleys of Rice County and a small segment of the Smoky Hill River valley in McPherson County, left at best minimal traces of transitory land use in the CKRA. The historic tribes, villagers and mobile hunters alike, may have passed through the area, but neither the Reed Collection nor any other collection known to me contains evidence of what also would have been transitory land use.

CHAPTER 5

Materials and Methods

Sources of Data

The primary materials used in this study are, of course, the collections the Reeds made over the years. The sizes of the collections from the individual sites vary considerably, from less than a dozen to nearly 1400 objects. What does not vary, however, is the care given to the collections' curation. Materials from individual sites are kept together. Some of the smaller site collections are placed several in a box, in which case the materials from the individual sites are bagged by site. Usually, though, a site will have its own box or, for the larger collections, several boxes. Fragile pieces are usually placed in a sturdy container such as a pill vial, film canister, or cigar box within the box. Other objects may or may not be placed in bags or some other type of container. All boxes are of the same size and construction (Figure 5.1). Each box is clearly labeled with the site number(s) and occasionally some other information. In short, the collection is curated overall according to the same basic principles used at institutional curation facilities.

One characteristic that defines a true archaeological collection, as opposed to just a collection of old things, are the records that accompany it (Sullivan and Childs 2003:2). In this sense, the Reed Collection is a true archaeological collection. Each individual site's collection has a corresponding file folder containing site and collection records. The record-keeping system is highly orderly (Figure 5.2). The folder tab is labeled with the site number, neatly written using a Leroy lettering set. On the left side of the folder's interior are the site form and map for the site, fastened to the folder by either staples or a short two-pronged binder. If the site form was later revised or the Reeds had corresponded with someone about the site, those records are with the original site form. On the right side of the folder, fastened to it in the same manner, is the catalog for that site's collection. The top page of each catalog is a sheet marked "Explanation of Catalog System." A site's folder may contain additional materials, such as photographs, newspaper clippings about Reed's work at the site, and even, in one case, a newspaper clipping with the site landowner's obituary. This material typically is loose in the folder.

It probably could go without saying that the information in the site's folder was extremely useful for writing this study. Certainly it would have been possible to review site forms at the KSHS and to number artifacts and create a catalog from the well-organized collection. Having all this information in one place, though, was much more convenient and, far more importantly, gave the Reeds' own assessment of the sites and objects. It also made it possible to know if anything was missing from the collection.

The Reeds' catalog system is simple and straightforward. The catalog sheets are KSHS record forms, but the numbering system differs from that used at the KSHS. Normally, each piece within the collection was given an individual number, beginning with the number 1 within each site's colleciton and continuing throughout that collection. The number is prefixed by an S, indicating that the artifact was a surface find. Although this study does not deal with excavated material, the records for the Reeds' excavation at 14SA415 show those catalog numbers to begin with an E. Many sites were visited several times. Each site catalog is a running list and new entries simply began with the next number when the objects from a repeat visit were cataloged. It is rare that numbers were skipped and inadvertent duplicates also are rare. In only a few instances were objects not cataloged. In these cases, it is presumed that the uncataloged specimens were late additions to the collection. Many, but not all, catalog sheets were typed. Catalog sheets frequently were signed and dated. These signatures and dates indicate that catalogs sometimes were prepared some years after the surface collection was made. Signatures on the catalog sheets (and the handwriting on sheets that were not typed) indicate that cataloging was variously



Figure 5.1. Example of a Collection Box

accomplished by Harold, Margie, or, occasionally, one of their daughters.

Another form of available records is a set of notes Harold made for many, although not all, sites. Sometimes he added to these notes after later visits, sometimes he apparently did not. Although they are brief, the notes often contain insights into his thoughts about particular sites and, to an extent, how he viewed the archaeological record in the area. They also reflect how a site may appear differently at different times, a situation that is well known to experienced field archaeologists.

Finally, Reed prepared a map of a portion of the area he covered. He had been trained in drafting while in the Air Force in the 1950s. The map is redrafted from the two USGS 7.5′ quadrangle maps that show the Smoky Hill River/Saline River confluence area (the southern edge of the New Cambria quadrangle and the northern edge of the Salina quadrangle). It does not cover the entire area of the collections, but it does include the area of the largest number of the sites. In addition to plotting the sites, Reed indicated the areas he surveyed. This is a rare occurrence. It makes negative data interpretable—which is to say that, if no site is plotted, we know that it means that no site was observed, *not* that maybe no site was observed or the area just was not surveyed. It also allows the site data to be used to estimate site densities and conduct settlement pattern analyses. This is enhanced by Reed's having noted several areas where the context is destroyed. It is not certain, however, how comprehensive this latter is.

Data

Contrary to occasional usage, the objects in a collection and the records, maps, and photographs that accompany them are not data. Data are measure-

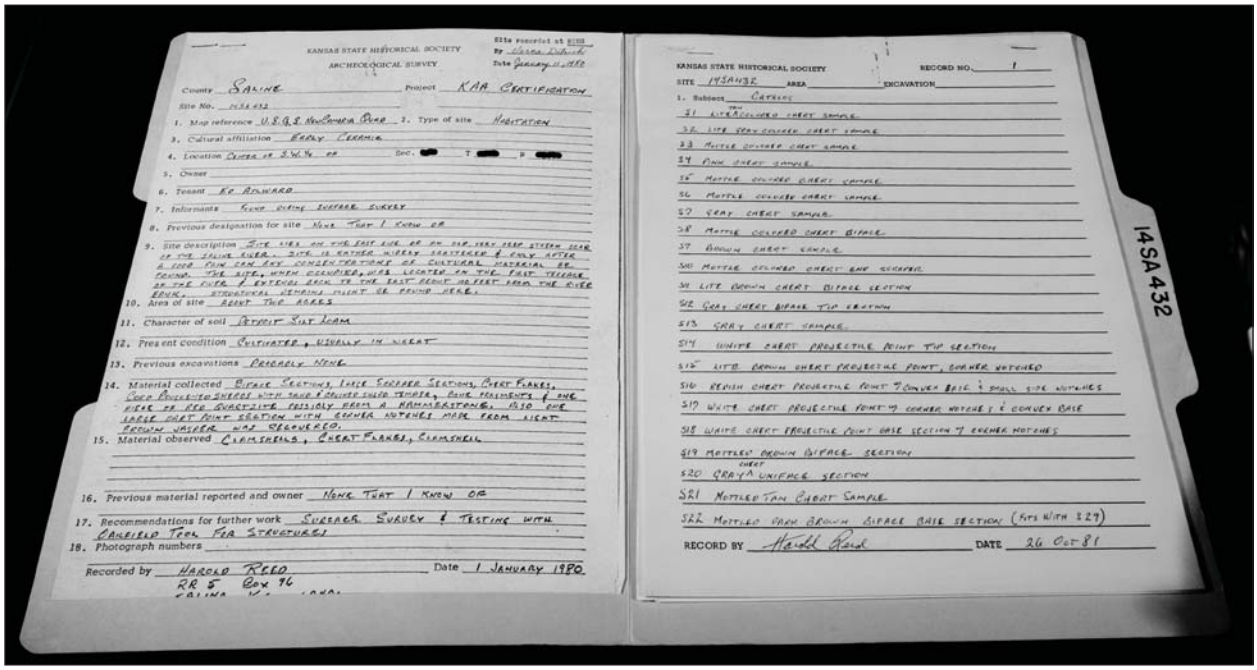


Figure 5.2. Example of a Collection Folder

ments and observations made about the objects, or drawn from the associated documentation (Banning 2000:7–8 is a brief but clear discussion). In principle, the number of possible measurements and observations that could be made is limitless. Most such measurements and observations, however, would be trivial, irrelevant, and sometimes redundant. The analyst, therefore, selects from the mass of possible measurements and observations those that are relevant to the research problem they are addressing. Practical considerations, such as the amount of time and money available, or the availability of the laboratory equipment needed for making a particular observation may also affect the selection. Sometimes too, the goal of ensuring that the objects can be compared with those already described and analyzed will affect the selection of what is to be recorded. In some ways, it is better to record too many data than to record too few, but the time and resources for doing so can be considerable.

Regardless, though, it is important that the measurements and observations be done consistently so that they are truly comparable, both within a single study and in comparison with other studies. Consistency and comparability is achieved by clearly defining terms to be used in recording observations and the criteria for assigning the term, and by specifying exactly how measurements are to be taken and the units (millimeters, centimeters, inches; grams, ounces) to be used in recording them.

Data recording for this project is anchored by a database, constructed using Microsoft Access™. Access is a relational database program, meaning that it contains a series of tables, each of which is created to hold data for a particular data domain and has data fields appropriate only to that domain. A set of relations among tables are defined to facilitate combining data from several tables in ways of interest to the user. The principles of relational database design are described in various computer manuals or texts that deal with issues in developing archaeological applications (e.g., McPherron and Dibble 2002). A recent article in the archaeological literature reviewed the advantages of using a relational database as opposed to other means of storing and retrieving data electronically (Keller 2009).

A first step in the analysis of the Reed Collection really was not part of the analysis at all, but rather the creation of an object catalog table in the database. I agree with Sullivan and Childs (2003:63) when they say that "the purpose of cataloging is not to record attributes or collect data for research purposes" but rather that it "allows the researcher to know what objects are in the collection." Thus, the catalog table for this project contains fields for site number, the object catalog number, the object name from the Reeds' paper catalog, my material class name and object class name, and the mass (weight) of the object. The object name from the Reeds' catalog is mostly transcribed from the pages in the site folder. However, notations like pottery decoration, projectile point type, or lithic raw material are analytical, not catalog, data and are not entered on this table.

One of the key advantages of electronic catalogs is that they are sortable and searchable. Those functions are enhanced—indeed, made possible—by the use of a restricted, although comprehensive, set of terms whose consistent usage and spelling is enforced. A catalog of free-text terms, or even variant renderings of the same term—such as projectile point, proj pt, pp—is not easily searched. Material classes defined for this catalog, and their spellings are: ceramic (cer), chipped stone (chst), ground stone (gdst), bone tool (bntl), fauna or unmodified bone (faun), shell tool (shtl), unmodified shell (shel), unmodified rock (rock), and historic objects (hist). Everything in the collection can be accommodated within these nine material classes. These classes are useful for some purposes, such as wanting to know the quantity of chipped stone tools in a site or summarizing the assemblage, but are too general for other purposes, such as wanting to know how many rim sherds the collection contains. This is the purpose of the object class field. Object classes are somewhat more specific identifications of the kind of object. Again, the keys are to use a restricted but comprehensive set of terms, to spell them correctly and consistently (either writing out a word or using a consistent abbreviation), and to use (or not) consistent modifiers, such as deciding whether to use the term sherd or body sherd for something not a rim sherd. It is not appropriate to break these down too far. Terms such as cord-roughened sherd or Scallorn projectile point or obsidian flake begin to record observations that are analytic data that also fall in different analytic domains (surface treatment on a sherd, type name of a projectile point,

or raw material of a piece of debitage). These are recorded elsewhere, in a format permitting them to be matched with the specimen they refer to or even compared with each other (for example, surface treatment with decoration on a sherd or raw material by chipped stone tool type) depending on a researcher's needs. The list of object class terms used in this catalog is shown on Table 5.1. The final data field in this table, mass, or weight, is common to all objects and is measured the same way in all cases. It is a frequent entry in object catalogs, and is so entered in this one.

Other tables in the database hold specific analysis data for various defined data domains. They include projectile points, bifaces, endscrapers, retouched flakes, debitage, and lithic raw materials as separate tables that all deal, obviously, with chipped stone tools. Measurements of these various object classes are not the same, so separate tables were created to hold measurement data. Conversely, raw material identifications are the same observation on all lithic classes and therefore are put into a single table that facilitates comparisons across classes without having to access each object classes' data table to compile the raw material data. Other tables include body sherds, unmodified bone, and shell. Conspicuously absent in this database is a table for rim sherds. This is because rim sherd data are entered into a separate database containing very detailed pottery data from a large part of the Central Plains. The data fields contain the measurements and observations made according to a set of standards and definitions that can be detailed for each material class (Roper 2008d).

Table 5.1
Terms

CER		BNTL	
	body sherd		scapula hoe
	rim sherd		digging stick
	daub		
	burned earth	FAUN	
			bone
CHST			
	projectile point	SHTL	
	biface		bead
	endscraper		worked shell
	drill		
	retouched flake	SHEL	
	debitage		shell
GDST		ROCK	
	abrader		sandstone
	hammerstone		rock
	ax/adz		
	pigment	HIST	
	pipe		metal
	metate		glass
	mano		ceramic

What this Study Achieves

To quote myself a few pages ago, "it is better to record too many data than to record too few data, *but the time and resources for doing so can be considerable*" (italics added). This comment, written early in the period of this study, was prescient. In fact, after optimistically designing the database for this project, it proved impossible to record all data for all objects since the available time and resources simply were insufficient. All data are recorded for some sites. Not surprisingly, these are sites examined early in the study. Otherwise, the catalog table is complete. That seemed essential, and it did facilitate summarizing each individual site's collection. Running queries to summarize collections also is a great way to spell check entries and find other entry errors that happen late on a long day, such as "material class = cer; object class = projectile point" (that would be a bizarre object). The catalog table should now be clean of those kinds of errors, although I do not guarantee that there are no absurdities, such as a 2512 gm (rather than 25.12 gm) body sherd (I've never met one that big, and do not have a balance that could weigh it). Another complete table is the body sherds table. The rim sherd data in the ceramics database also are complete and a table collecting the essentials of those data will be collated and added to the Reed Collection database to enable it to stand on its own.

The descriptions in the following four chapters, therefore, are reviews of the collections that basically account for their contents and give some specifics of the form of the objects. Emphasis is placed on reviewing the diversity of the object classes present

and the variety within those classes. Details of each piece are not belabored, particularly in such classes as bifaces, where many specimens are irregular and many actually are fragmentary, or retouched flakes that, virtually by definition, will be made of all manner of flakes. Chipped stone objects are the most common material class in the collections, and for these I have tried to consistently record lithic raw material type. For reasons that were hinted at in the last part of Chapter 4 and will become clear in Chapter 11, I make minimal use of projectile point type names, and then almost entirely for earlier sites. I do not at all use pottery type names for reasons discussed in Chapter 10 and reflected in Chapter 11. The first part of the account of each individual collection is a description of the site, using information from site forms and supplementary notes, when available. A few sites have more inclusive, and usually earlier, work than that of the Reeds and, when applicable, this investigation history also is reviewed.

A bottom line, then, is that the collections have much greater information potential than could possibly be realized by one person working on an available time basis. Part of the reason too is that the potential encompasses more possible avenues of study than any individual archaeologist normally has the expertise to undertake in detail. Most practicing archaeologists have the knowledge necessary to write descriptions of entire collections and need not be specialists to perform some analyses of most material classes. Most practicing archaeologists also, however, have greater expertise (and interest) in a specific class. My interest and expertise lies with pottery and with how we can use it to address other aspects of lifeways and society, and, for that matter, even to address basic matters of culture-history that underpin our studies of lifeways and society. This will be reflected in later chapters of this book. The potential of the chipped stone element of the collections is very considerable and, given that the study area is adjacent to and into the primary source area for Dakota Formation sandstone, the groundstone element of the collections also has good potential. Bone and shell tools or ornaments are present, but in small numbers and the study of this material, while possible, will not provide major insights. The potential of the unmodified bone and shell elements of the collection also is not particularly high. This is understandable with surface collections and in collections from an area where bone preservation can be much less than ideal.

The next four chapters describe the sites and the collections. They are arranged both temporally and spatially. Chapter 6 considers the Paleoarchaic sites in the study area, arranging them in a rough temporal order. Chapters 7 and 8 deal with the Intermediate and Late Prehistoric period sites, respectively. In an earlier journal article based on these collections and dealing with (at that time still using the standard culture-history terminology) Smoky Hill phase settlement patterns in the Salina area (Roper 2006c), I recognized two classes of sites: lodge sites and campsites (actually, a third site class was cemeteries but that is not applicable in this study). That functional division remains useful, but as the study progressed, it became clear that what I called the campsites form the Intermediate site group, and that the lodge sites form the Late Prehistoric site group, although it is possible that some of the campsites are contemporaneous with and related to the lodge sites. Within each of these chapters, sites are arranged geographically, starting near Salina and the Smoky Hill River/Saline River confluence area, following up the Smoky Hill River, then the Saline River, then, in the case of the Late Prehistoric sites, the Solomon River. Although the three localities forming Late Prehistoric subgroups do not overtly further enter site arrangement, because of the spatial coherence of the site groups by locality, the arrangement *de facto* so groups them.

Finally, several sites are represented by small collections or, in one case, no collection at all. These sites do not fit into any of the other three chapters because—except for one mound—the site function is uncertain, and because—except for one site that might be assignable to the Great Bend aspect, in which case it still would fit in no other chapter—their temporal assignment is very uncertain. These sites are described in Chapter 9.

CHAPTER 6

Paleoarchaic Sites

Previous Records of Paleoarchaic Sites in the Study Area

Paleoarchaic remains are fairly scarce in central Kansas, and the earlier the cultural complex, the more infrequent are the reported remains. Clovis and Folsom points, the fluted projectile point types that represent the earliest known cultural complexes in North America, are entirely unknown in either Saline or Ottawa counties (Blackmar and Hofman 2006:53). No late Paleoindian forms are reported from an Ottawa County location and only two are known from Saline County sites (Blackmar and Hofman 2006:54). One of these points is an Alberta point from 14SA462; the other is an Allen point from 14SA453 (McLean and Peter 2004:66, and on-line site records for both sites; the points are not illustrated in the cited work, but their general form is illustrated by Blackmar and Hofman [2006:50] and many other sources). Each of these points apparently is an isolated find in the Gypsum Creek valley, downstream from the study area considered here. No further information is available for either site.

Sites that traditionally would be assigned to the Archaic period are only somewhat better represented. Blackmar and Hofman (2006:51) recognize only five sites in Saline County and none in Ottawa County. A more recent search of the on-line site files for these counties returns a list of six Archaic sites in Saline County and none in Ottawa County. Two of these sites lie well upstream in the basin of Castle Creek, a tributary of Spring Creek, in the Dakota Hills in the southwest part of the county. They are well away from Reed's study area and were not recorded by him. One of these two is an isolated projectile point likely attributable to the Archaic period; the other is a small scatter of four lithic objects, one of them apparently a repurposed Archaic point not more specifically identified on the site record (Logan 2001:49–51, 60–62).

The other four Saline County Archaic sites, as they are listed in the state site files, were recorded by Harold or Debbie Reed. They include 14SA413, 14SA424, 14SA431, and 14SA444. Site 14SA444 is a mound that likely is a later, Woodland tradition, site, but the first three of these sites do contain Archaic materials. Additionally, examination of collections from this study indicates that 14SA447 also is an Archaic site. This chapter, then, describes four sites: 14SA413, 14SA424, 14SA431, and 14SA447. The general locations of these sites are shown on Figure 6.1.

Paleoarchaic Sites in the Reed Collection

Site 14SA413

Site 14SA413 appears to be the oldest site represented in the Reed Collection. It lies on a toe slope on the south (right) side of the Smoky Hill River, about 0.8 mile downstream from the point at which the Saline River currently flows to the Smoky Hill River. The stream confluence has changed position considerably even in historic times, however, and even as recently as 1858, when the GLO surveys were run, the confluence was less than one-half mile from 14SA413. Thus, we cannot be sure of the position of rivers relative to the site at the time of its occupation. The elevation of 14SA413, as plotted on the USGS 7.5′ Kipp quadrangle, is 1200–1220 feet above mean sea level (amsl), minimally about 30 feet above the river bottoms. The landform is a narrow ridge that lies at the base of the gentle valley wall and extends a short distance into the river bottoms. Soils and topographic data suggest that it might be a terrace remnant.

The original site form for this site is not dated, but it probably was filed in the late 1960s or early 1970s. Reed's notes indicate that he had not visited it very many times, since it was usually covered with weeds. A January 2000 revision to the site form indicated that the area was in the CRP program at that time. The extent of the site is unknown. It is a lithic scatter containing tools, tool fragments, and unmodified

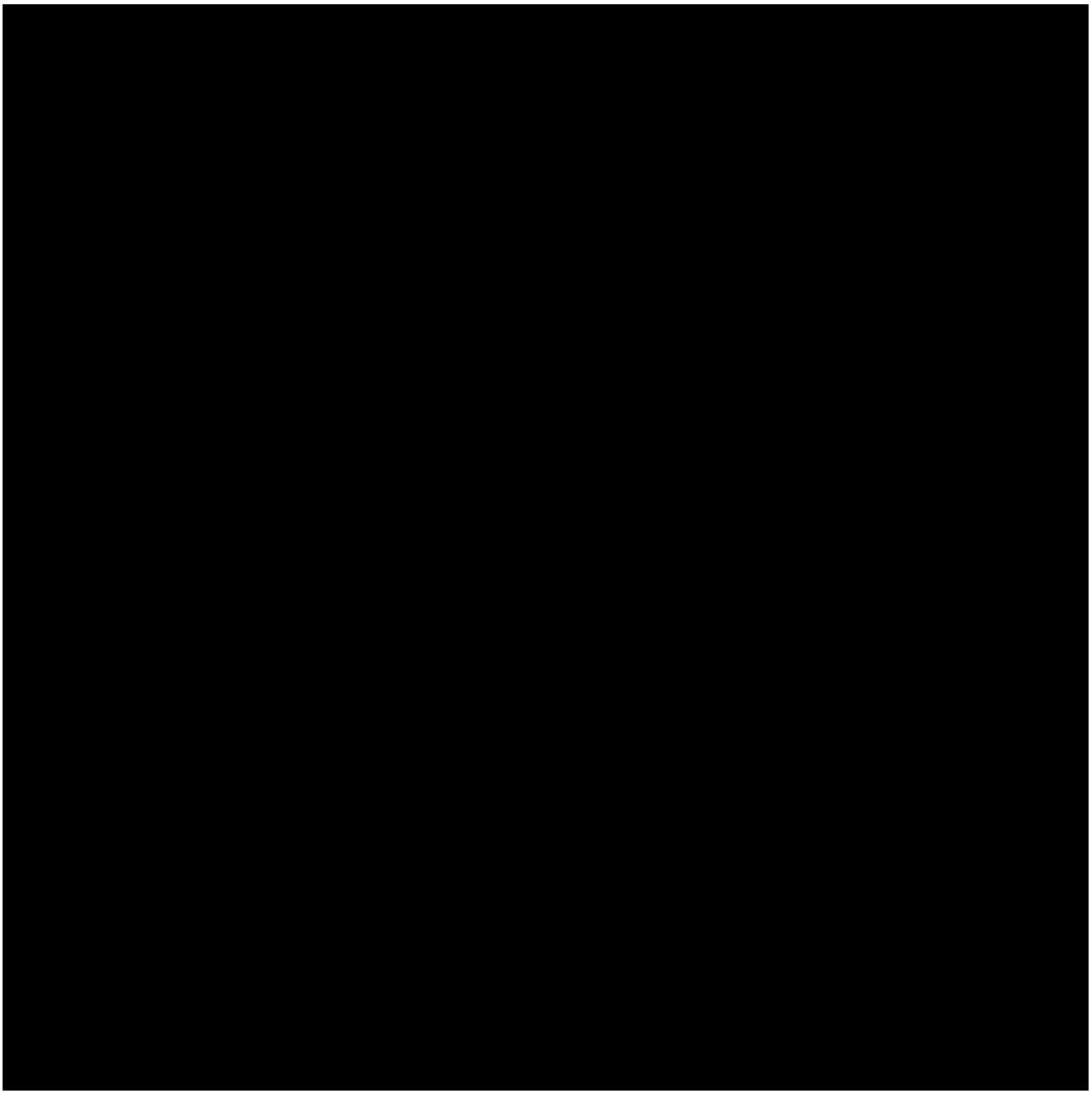


Figure 6.1. Paleoarchaic Sites Described in this Chapter

debitage. Reed indicated that the site has "quite a bit" of debitage and that materials appear in two or three concentrations.

The collection contains 13 objects, including one projectile point fragment, two drill parts, two biface fragments, six endscrapers or fragments of endscrapers, and two retouched flakes (Figure 6.2; it should be understood that this and all subsequent collection photographs might or might not illustrate all objects in a site's collection). The projectile point fragment is a partial proximal portion of a side-notched specimen. The blade is transversely fractured around mid-blade and an oblique fracture extends from one notch to past the middle of the base. Still, enough of the artifact remains to allow its identification as an Early Archaic point similar to those from a number of excavated sites in Kansas, Nebraska, western Iowa, and beyond (see review in Roper 1998:6). While the type name Logan Creek, after the Logan Creek site in Burt County, Nebraska, is sometimes assigned to these points (cf. also Blackmar and Hofman 2006:50), more often they



Figure 6.2. Objects from 14SA413

are not given any type name. This particular specimen was made from Permian chert.

Two slender biface fragments may be narrow blade sections of lanceolate or notched projectile points, but more likely are shaft segments of drills. One specimen, a distal end segment, was made of Alibates agatized dolomite. The other is a medial segment of what appears to be a fine-grained quartzite. The quartzite specimen has a more or less diamond-shaped cross-section; the other is asymmetrically biconvex. Each exhibits good flaking and neither appears to show the form of wear that is so often associated with drills. Although not in itself temporally or culturally diagnostic, drills such as this are reported from Archaic context elsewhere on the Plains, including at Signal Butte, Nebraska (Knudson 2002:128), and a burial site in Douglas County, Kansas (Hoard et al. 2003).

Each of the other two biface segments is a very fragmentary edge segment from an original of unknown shape and size. The larger of the two is Permian chert; the smaller is a homogeneous slightly off-white material that probably is from Mississippian formations in Missouri, Iowa, or somewhere in that vicinity.

The collection contains five endscrapers, two of them fragmentary, the other one complete. All were made on flakes. Lateral margins usually were minimally shaped, if shaped at all. Distal ends were reworked to curved edges by continuous steep retouch. Three specimens were made of heat-treated Florence A chert. The other two were made of Permian chert from the Flint Hills north of the Florence A source area.

Two other pieces in the 14SA413 collection may be scraper fragments but they are too small to reliably identify. One is a thick flake of Permian chert with a steeply retouched working edge. The other is a broken flake of Smoky Hill jasper with a single but continuous row of retouch flakes on the remaining portion of a lateral margin.

The final piece is a long, narrow, blade-like flake

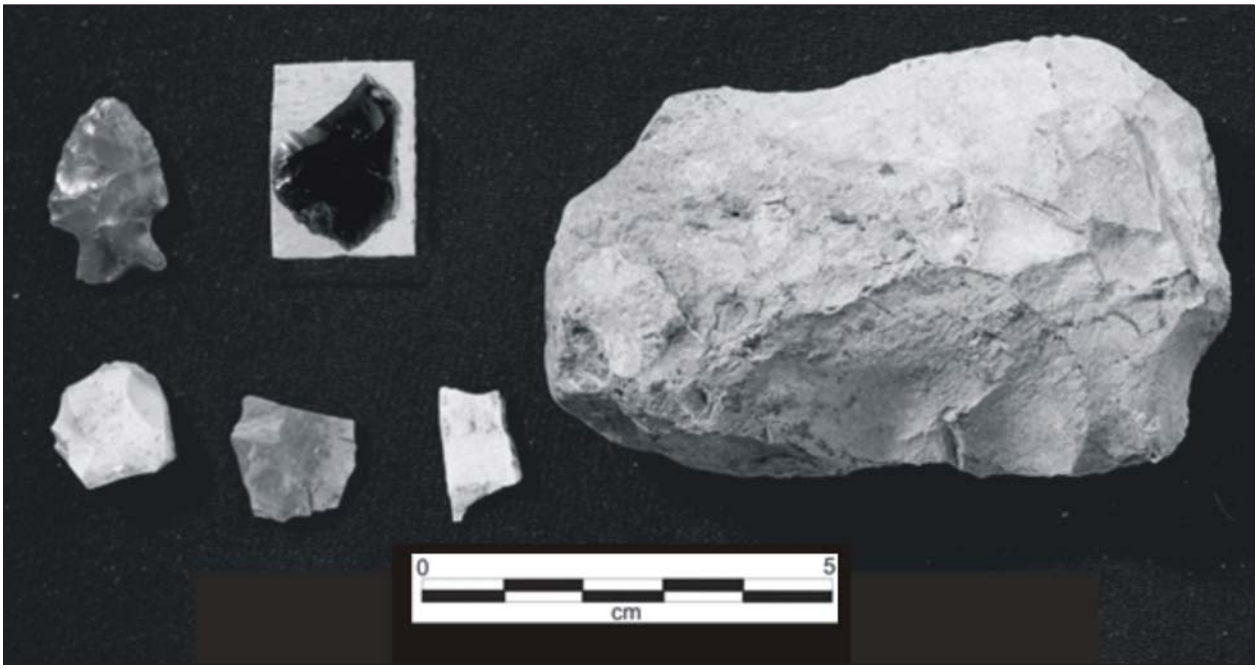


Figure 6.3. Objects from 14SA447

of Permian, possibly Florence A, chert. Modification of the lateral margins appears to be a mixture of deliberate retouch and more recent damage.

Site 14SA447

Site 14SA447 lies on the back part of the Saline River valley bottoms on the north side of the river. The river currently is about 1300 feet away. The setting is in the vicinity of a third-order stream that flows from the north and joins the Saline River. [redacted] This stream, which has a course of only about three miles, is shown on the GLO plat map of 1858. At that time, it joined the Saline River about three-quarters of a mile upstream from its current point of confluence with the river. Site 14SA447 is near the old channel of Crystal Springs Creek and, at the time of occupation, may well have been associated with that stream as it flowed across the river bottoms to its confluence with the river. Its elevation is at or just above 1210 feet amsl.

Reed's site form for this site is dated February 5, 1983. He described the site as less than an acre in a cultivated field and suggested an Early Ceramic temporal assignment. No additional information is given on the site form nor are supplemental notes available to further describe the site.

The collection from 14SA447 is small and is limited to 11 objects (Figure 6.3). These include one projectile point, one small bifacial celt, six pieces of debitage, two bone and tooth fragments, and one piece of unmodified rock.

The point is a small expanding stem specimen. It is largely complete but may be missing the last few millimeters of its distal end due to impact fracture. Blade lateral margins are convex. Shoulders are at an oblique angle to the longitudinal axis. The base width is narrower than the shoulder width. The base also is damaged leaving its original form indeterminate. It is made of Hartville Uplift chert from southeast Wyoming.

This point closely resembles one that Blackmar and Hofman (2006:50, Figure 4.1I) illustrated and referred to as a Late Holocene Stemmed point, a term that probably was intended to be descriptive rather than a formal type name. Their illustration closely resembles, and perhaps is drawn from, a specimen from the Snyder site (14BU9) in the El Dorado Lake area in Butler County (Grosser 1973:236, Figure 7c). Grosser attributed the occupation zone containing this point to the Chelsea phase, which he dates to

approximately 4750 to 3950 radiocarbon years before the present (rcybp) (approximately 5500 to 4400 cal BP). Grosser (1973:235) suggested that this form "appears similar to points associated with the Logan Creek and Simonsen complexes." This is not, however, a good comparison, for the Logan Creek and Simonsen site points (as well as those from other sites mentioned above) are true side-notched forms (like that from 14SA413) and not the corner-removed, stemmed form that is reflected at 14SA447. The Chelsea phase style also is later than the Logan Creek material and is more appropriately regarded as Middle Archaic.

The bifacial celt is made on a cobble of fine-grained quartzite that probably is Spanish Diggings quartzite from a source area near the Hartville Uplift in southeast Wyoming. The poll end is unshaped and cortex-covered. The lateral margins diverge slightly from the poll to the bit. The bit is not even, either in plan view or cross-section. Its center exhibits heavy step-fracturing from use.

The six pieces of debitage include both shatter and flakes from biface reduction. All but one flakes are less than 25 mm in maximum dimension; the other is in the 40–45 mm size class. Five of the six pieces are Permian chert. The sixth flake is obsidian of the Malad (southeast Idaho) source type (Roper and Hughes 2014).

One piece of faunal material is a small flake of bone from a mammal, but the element and species cannot be identified. The other is a fragment of tooth enamel from a mammal, probably a large one. The unmodified rock is a limestone pebble that may or may not have been associated with the occupation.

Site 14SA424

Site 14SA424 lies about [redacted] With the exception of one extreme outlier in Lincoln County (14LC301), it is the farthest site upstream on the Saline that Reed collected. The site lies on the north (left) side of the river, inside a gentle meander of the current channel. Its elevation is a little above 1210 feet amsl.

The site form Harold Reed completed for 14SA424 is dated November 2, 1976. On it, 14SA424 is described as extending across about a half-acre of a cultivated field. Supplemental notes describe the site as yielding "very few artifacts, maybe two pieces each year." However, the collection contains 171 objects. At two pieces a year, it would take 86 years to accumulate a collection this size, so it must have been somewhat more productive than that. Still, repeated catalog entries, ending in late 2001, reflect repeated visits to the site over a period of 35 years.

Table 6.1
Collection Contents—14SA424

Material class	Object class	Count
Ceramic		
	Rim sherd	1
	Body sherd	15
Chipped stone		
	Projectile point	38
	Biface	34
	Drill	5
	Endscraper	20
	Retouched flake	10
	Core	2
	Debitage	31
Groundstone		
	Mano	2
	Mano/nutting-stone	1
Faunal material		
	Bone	5
	Tooth	2

The 14SA424 collection is quite large, comprising a total of 166 pieces (Table 6.1). The single rim sherd and all body sherds are small fragments of the vessels they represent. The rim sherd is very short and is only the upper part of the rim of a vessel that nevertheless appears to be from a jar with a short direct rim. Aplastics include a moderate amount of medium sand, but whether that is a natural inclusion or deliberately added temper is uncertain. All surfaces are smooth. No decoration appears on the remaining portion of the rim exterior. Rim thickness is about 6.9 mm.

The body sherds are something of a contrast. Tactilely, they seem to have much less sand in the fabric; visually it is difficult to evaluate this without breaking a sherd but it appears that only modest quantities of sand, as a natural inclusion, are present. Deliberately added temper appears to be sparse

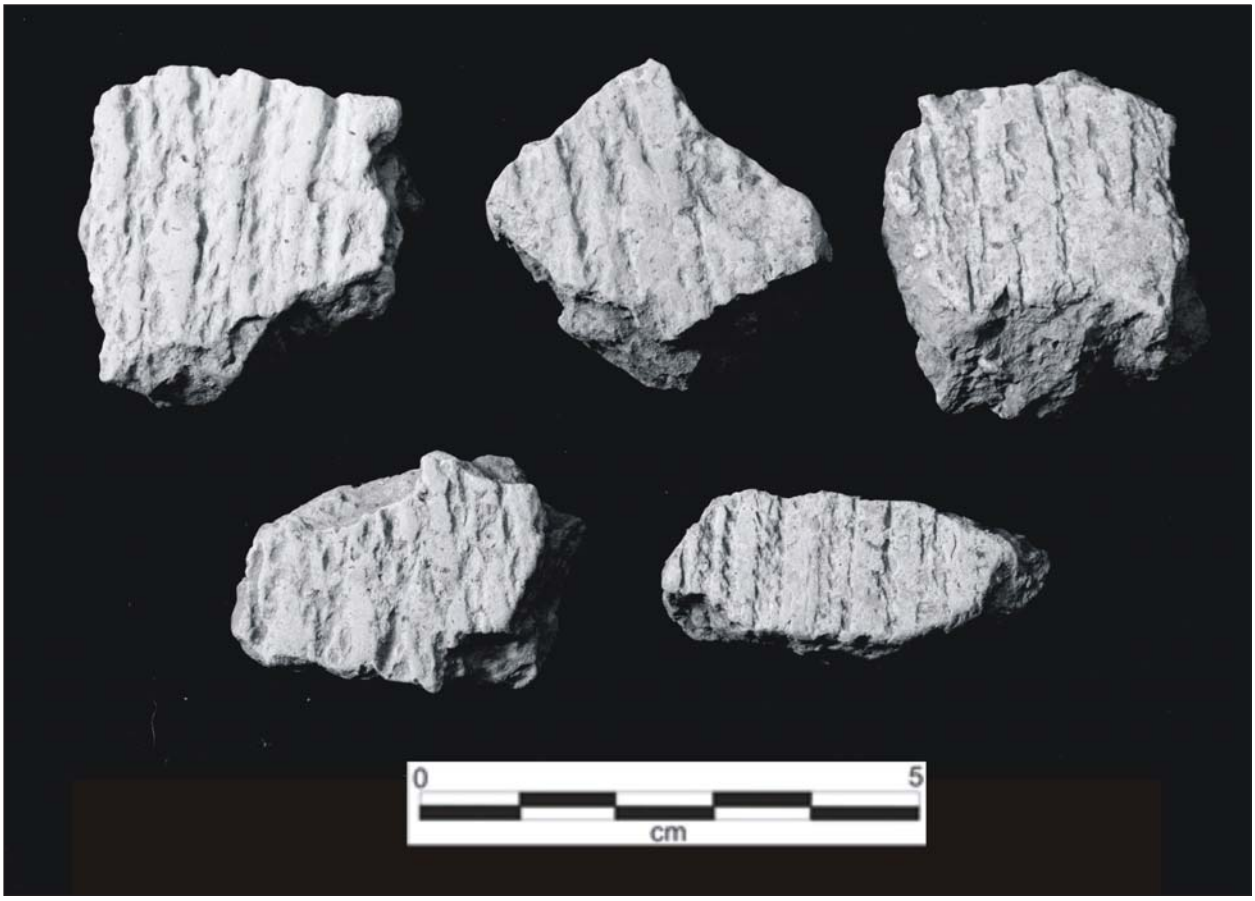


Figure 6.4. Body Sherds from 14SA424

quantities of rounded coarse sand. Exteriors are cord-roughened (Figure 6.4). Eleven complete thicknesses range from 7.1 to 12.8 mm, with a median of 8.8 mm. These body sherds are from vessels of a different ceramic tradition than the rim sherd.

The 38 projectile points are a highly varied group. For purposes of this presentation, they have been sorted into morphological subgroups. Point type names are not assigned. The applicability of these names in this region is not established, and that is relevant because names carry some baggage with them. Chief among that is an implied temporal range that may or may not be accurate in any given situation, particularly a situation such as this where no actual dates are available for a site and where no comparable dated material from the study area could suggest what date might be correct. Further, the sub-groups contain small numbers of specimens, but yet are sufficiently varied that fidelity to a type name is not always clear. For these reasons, then, the subgroups are assigned descriptive labels, rather than names, to distinguish them from one another.

A possible lanceolate point segment of Smoky Hill jasper, is a straight-sided, straight-based haft element of a broken original (Figure 6.5). In principle, it could be the square stem of a point in one of the other subgroups, but in actuality, it is proportionally larger than are the stems of points in that subgroup and is not optimally included within it. The point has a lenticular cross-section and may have light grinding on the base and lateral margins of the haft. It may have parallel flaking, but too little of the point remains to be sure if it really did or if the few flake scars on this piece just appear that way. It is not outside the realm of possibility that this is a fragment of a late Paleoindian lanceolate point. If so, it *could* indicate an early use of this location, or it *could* indicate redeposition by either natural processes or later collection and loss, or it *could* represent persistence of the lanceolate form into the Archaic period.

Four large square-stemmed points (Figure 6.6),

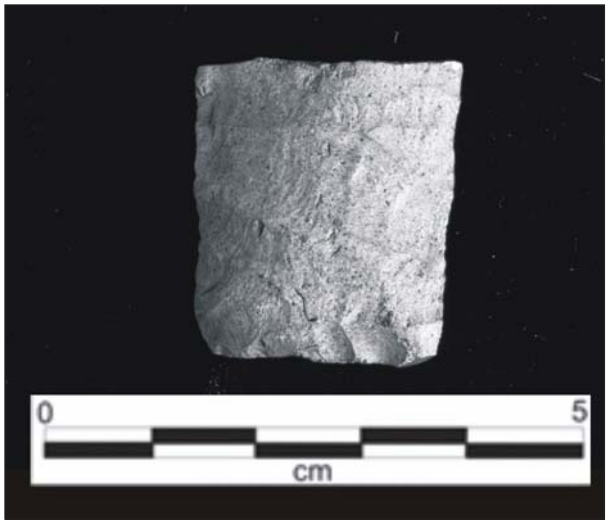


Figure 6.5. Possible Lanceolate Point from 14SA424

three of them complete or nearly so, one of them represented only by the haft element and a small part of the blade, have large and proportionally wide triangular blades, narrow but distinct shoulders, and square, or approximately square, haft elements. Bases are straight, lateral margins nearly so, and all three margins may be lightly ground. Blade margins are finished with small, regular continuous flakes that give the point a quasi-serrated appearance. All specimens in the 14SA424 collection are Permian chert. A comparison, made with considerable trepidation, might be to Etley or Smith points, although the 14SA424 specimens lack the barbed shoulders of those points.

Nine medium square-stemmed points or fragments compose a medium square-stemmed point subgroup (Figure 6.7c). Additional specimens, described below as endscrapers, are repurposed points whose originals would have been placed



Figure 6.6. Large Square-Stemmed Points from 14SA424



Figure 6.7. Medium Points from 14SA424

in this subgroup. Those specimens, along with the points, make this the best represented point subgroup on this site. Haft elements have straight lateral margins and straight to very slightly concave or convex bases. The one complete blade is triangular with a well-defined longitudinal ridge on each face. Obviously it cannot be determined if other specimens are that well-formed, but remnants of blades on a few pieces suggest not. These points are of Permian chert.

Another nine medium expanding-stemmed points (Figure 6.7 a-b, d-f) are a subgroup of nearly complete points, eight of which are Permian chert and one of which is a white chert probably from the Mississippian system of extreme eastern Kansas/western Missouri. Haft elements of these points have slightly concave lateral margins and slightly concave to mostly straight to very slightly convex bases, giving the haft overall an appearance of expanding somewhat to the base. Blades are long relative to their width, with moderately convex lateral margins. A distinct shoulder can be detected, but shoulders overall are not pronounced and certainly not barbed. Cross-sections are lenticular but fairly thick relative to overall point size.

Four small-to-medium expanding-stemmed points are similar to those just described, but are overall smaller and may just represent the smaller end of a size continuum (Figure 6.8a–e). Three of these points are of Permian chert, the fourth is Smoky Hill jasper.

A small-to-medium corner-removed point of Permian chert has a proportionally small haft element with a narrow neck, expanding lateral margins ending in well-rounded, almost bulbous, haft corners and a convex base (Figure 6.8f). The blade is somewhat longer than wide with convex lateral margins. The shoulders are broad and prominent and only slightly barbed.

Four small arrow points include one complete and three fragmentary specimens. The complete specimen is a corner-notched point whose blade has convex lateral margins. One of the three fragmentary specimens is the proximal portion of a blade. The break across the neck leaves enough of the notches to indicate that this too is a corner-notched specimen. The other two fragments are from the distal part of blades and cannot be further described.

The remaining projectile points are miscellaneous pieces that are too fragmentary to allow a reliable assessment of original form.

Bifaces are a prominent object class in the 14SA424 assemblage. Highly noticeable among the bifaces is a subgroup of 13 large specimens with convex lateral margins and varying end shapes and thicknesses (Figure 6.9). All are Permian chert. All



Figure 6.8. Medium and Small Points from 14SA424

were shaped by primary and secondary flaking, but none have edges finished by fine tertiary flaking. It is entirely possible, even probable, that these are not finished tools, but rather pieces left as they are in anticipation of future needs, such as using the biface as a source of flakes to be made into other tools or used as is, or to further reducing the biface itself to make a projectile point.

Other bifaces include several pieces showing similar manufacture but that overall are considerably smaller. One of these is on a coarse quartzite, two are Smoky Hill jasper, others are Permian chert.



Figure 6.9. Large Bifaces from 14SA424

The remaining bifaces are mostly fragments of specimens of uncertain original form and, often, size. Most are Permian chert.

Five incomplete drills are present (Figure 6.10, top left). The most nearly complete of them, and the only one with its proximal end, is a T-shaped drill, possibly, although not necessarily, representing a projectile point that has been reworked as a drill. The other four pieces are a distal part of a drill bit and three medial drill bit segments. All five are of Permian chert.

The endscrapers are a varied lot (Figure 6.10). The most distinct subgroup is composed of six specimens that are repurposed medium square-stemmed projectile points. In each case, the blade is completely removed and, in effect, the distal end of the haft is reworked to a very steep and not particularly wide working end. Other scrapers are usually fairly small, and were made on flakes of Permian chert or Smoky Hill jasper.

Flakes in this collection, including those that were retouched and those that were not, are predominantly the thin flat flakes that characteristically result from biface production. They are predominantly Permian chert. This seems quite consistent with the presence of the large bifaces from the same raw material. A few pieces of unmodified debitage are split pebbles or cobbles.

The eight groundstone or rock objects in this collection include three manos and five cobbles. Each mano is a complete specimen of Dakota sandstone. Each has been shaped to fit the hand and each exhibits use-wear on the grinding face. One of them actually seems to have use/wear on each face. Another of them has grinding on only one face, but the other face, which is not particularly flat and even, has a pit measuring approximately 25 mm in diameter. A plow scar is visible across this face of the piece, and the pit may result from plow damage, but it also is possible that it is a so-called nutting stone (Figure 6.11). This might be appropriate in the cultural context of this site.

The cobbles might have served as hammerstones, although evidence of battering seems absent from at least one of them. In light of the possibility of a nutting stone on this site, hammerstones, usually thought of as tools used in stone tool fabrication, could have been used to crack nuts. Of course, any of them could have been used for both purposes or for other purposes, or not used at all.



Figure 6.10. Drills and Endscrapers from 14SA424

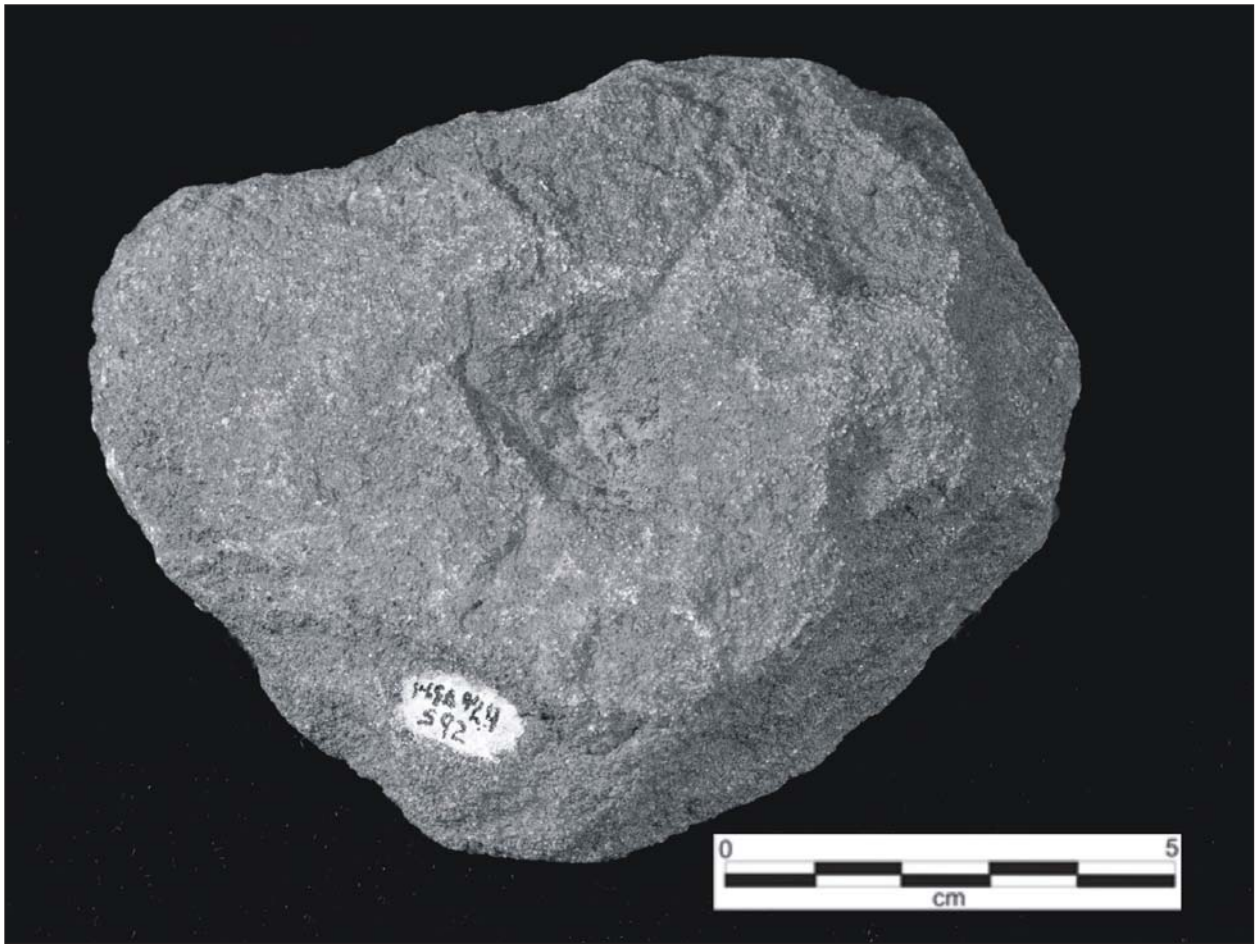


Figure 6.11. Possible Nutting Stone from 14SA424

The collection contains seven pieces of unmodified animal bone or tooth. One is a small rodent incisor that probably is a modern intrusion on the site. The other six, however, likely pertain to the prehistoric occupation at this site. Two are small burned fragments that are not identifiable. The other four are bison elements, including an essentially complete metacarpal/metatarsal with a cut mark near one end. Also identifiable are a tooth fragment and two small fragments of long bones. The bison bones are heavily weathered.

Site 14SA431

Site 14SA431 is about one mile east of 14SA424. [redacted] However, since this stream formerly joined the Saline River some distance away from its current point of confluence, it is possible that its lowest reaches now have reoccupied abandoned channels of the Saline River. In fact, old stream scars of the Saline River join this stream channel near the site. It is possible, therefore, that the occupation represented by this site was on the north bank of the Saline River, rather than on the bank of Crystal Springs Creek. The site elevation is just above 1200 ft amsl.

The site form for 14SA431 is dated November 5, 1978. It is attributed to Debbie Reed, although the site form itself clearly is in Harold's handwriting. The form describes the site as covering about one acre in a cultivated field. The site form and a supplemental note both indicate that the then-landowner (now deceased) had a groundstone celt from this site. In a second supplemental note, dated February 1983, Reed said that he would like to find enough on the site to indicate who made the celt—i.e., find temporally or culturally diagnostic artifacts. He contin-



Figure 6.12. Chipped Stone Objects from 14SA431

ued by saying that he had thoroughly searched the area "three or four times" without much success. Artifacts were scarce, he said, although it was fairly easy to find debitage under good conditions. "I will keep looking," he concluded.

Several colors of ink in the catalog pages apparently reflect additions to the catalog as new material was brought in during those repeated site surveys. The entire collection contains 33 artifacts, including the celt that he obviously pried away from the landowner at some point.

The chipped stone object portion of the 14SA431 collection (Figure 6.12) is limited to five bifaces, two endscrapers, one core, and 16 pieces of debitage. All but one of these objects are Permian chert, none of it Florence A.

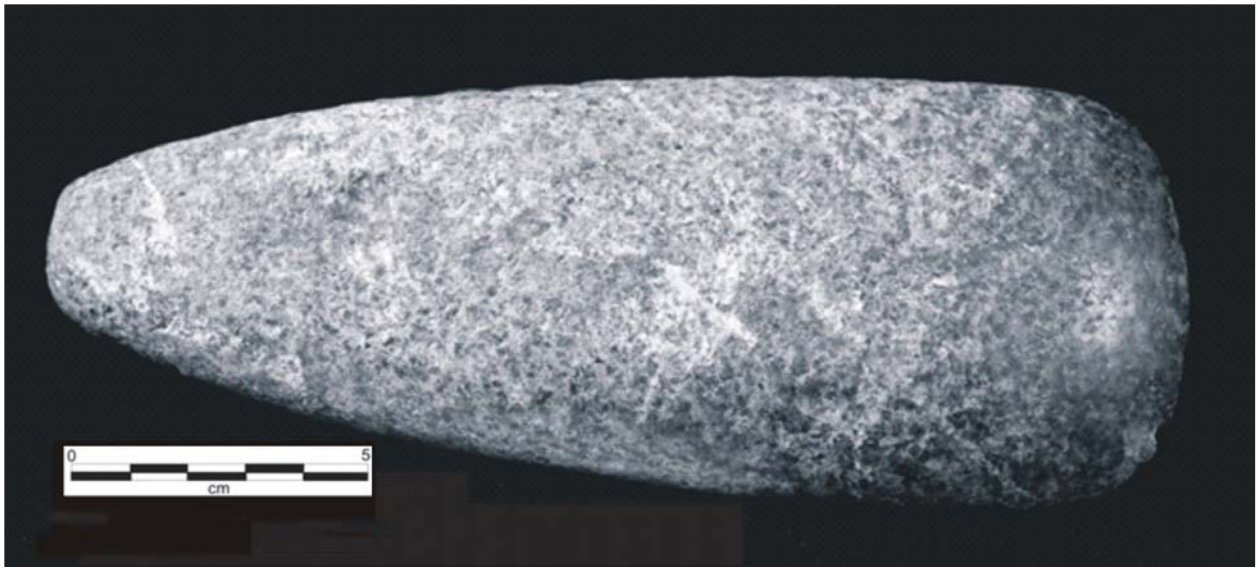


Figure 6.13. Groundstone Celt from 14SA431

The raw material exception is a biface that is made on a fine sandstone or siltstone. As improbable as that seems, the piece nevertheless reflects obvious working in a manner consistent with knapping chert or another common toolstone. It is a thick tool that is complete. The other bifaces are complete triangular specimens. They are too large to be projectile points, but they could be blanks or preforms for dart or spear points, or they could have been intended for other use, for one characteristic of a biface is that it is an object that is largely reduced of excess material (weight) but is not specifically committed to any particular form and still can be further reduced, or not, for one of many purposes. This can be particularly critical in areas where chert is scarce. The final two bifaces are end fragments, one pointed, one rounded, of objects of indeterminate original form.

Each of the two endscrapers is a complete large (64.9 mm long × 36.0 mm wide × 13.3 mm thick, and 54.1 mm × 39.2mm × 12.2 mm) tool of Permian chert. They are well-formed, with flaking completely covering the dorsal surface and with a pronounced and even keel running the length of the tool.

The core bears a superficial plan view resemblance to an endscraper. As endscrapers usually are, it was made on a large, thick flake and is only somewhat larger than the two specimens just described (85.1 mm long × 43.6 mm wide) but it is excessively thick (30.5 mm). What seems to be the working end is not even, however, and this object would never function properly as a scraper. The ventral surface of the flake original functioned as a striking platform and flakes were removed from much of the perimeter. It is possible that these removals were a futile attempt to thin the flake and produce an endscraper, and it is also possible that some of the flakes removed from the piece were large enough to be further reduced or used as they were.

The debitage in the 14SA431 collection is a mix of shatter and reduction flakes. All is Permian chert.

The most prominent groundstone object in this collection is the complete and nearly undamaged granite celt (Figure 6.13). It is 202 mm long, 74.9 mm in maximum width, and 45.7 mm in maximum thickness. The poll end is 22.8 mm wide. From it, the lateral margins diverge along a slight curve to the point of maximum width, and then converge slightly to the 66.4 mm wide bit. The bit, which probably once was reasonably sharp, now is slightly battered, likely from use. Also reflecting use is wear that is visually apparent in the right light and certainly tactically obvious. Low power (10×) microscope examination shows shallow striations resulting from use oriented in several directions, but predominantly at an oblique angle to the bit.

A few other objects in this collection include one fist-sized rock that may have been a hammerstone, one unmodified chunk of limestone, three pieces of unmodified freshwater mussel shell, and one small (ca. 10 gm) unidentifiable weathered bone. Two pieces of clinker are of recent temporal provenance and are unrelated to the native use of this location.

It is not possible to reliably attribute a temporal or cultural affiliation to this site. The lack of pottery does not necessarily mean it is Paleoarchaic in age, although it probably is. Endscrapers are not temporally/culturally diagnostic to the extent projectile points (and pottery) are, but they are not totally without some diagnostic value. In this sense, 14SA431 is not likely attributable to Paleoindian or the late prehistoric group, nor is it likely to be either Early or Middle Archaic. A best guess is Late Archaic. This may be particularly plausible in view of the site's proximity (slightly under one mile) to the large 14SA424 and the similarity of some of the bifaces and scrapers to tools from that site. The granite celt might also best fit in that period. Although I have recently seen and described a very similar and only slightly smaller specimen from Central Plains tradition context in southern Nebraska (Roper n.d.), certainly no other Central Plains tradition site in this locality has such a tool in its assemblage, whether that assemblage results from surface collection or excavation (Bevitt 2006; Latham 2006b; Roper 2001; Roper and Reed 2003; Wedel 1934a).

CHAPTER 7

Intermediate Sites

One aspect of central Kansas archaeology, and specifically of CKRA archaeology, that this study has revealed is the abundance and importance of small sites in area prehistory. The information potential of small sites, many of them in this instance extending across less than a quarter-acre, often is overlooked and even underplayed, but nothing could be further from the case. The importance of any site does not derive from how large it is, how long it may have been occupied, or what it contains, but rather what we can learn from it. It might be something of a distortion to say that I learned more from the small sites in the CKRA than I did from the late prehistoric lodge sites (remembering, of course, that I already knew something about those), but I think it no exaggeration to say that I learned at least as much and that this is information that could not possibly be obtained from study of the lodge sites alone.

In general, the small sites in the CKRA occupy positions adjacent to either the Smoky Hill River or the Saline River or to an old meander scar of one of these rivers. As discussed in Chapter 3, it is a good presumption that in late prehistoric times these meander scars either represented the river channel or were already cut off, but yet were wetlands that held a rich suite of aquatic floral and faunal resources. Assemblages are small and limited, but informative, generally consisting of a few sherds, often a projectile point or point fragment, possibly another chipped stone tool or fragment, and some debitage, as well as mussel shell and possibly a few bone fragments. I interpret them as aquatic resource extraction camps. In fact, I have suggested in print, and continue to hold, that the buried late prehistoric component in the south block of the upper components at the Claussen site (14WB322) in Wabaunsee County may be not so much qualitatively different from any of these sites as it is simply a stunningly well-preserved example and analog (Roper 2005b). Some variation on the basic theme may suggest variation in specific camp function, but a safe presumption is that they still were camps for extraction of specific or a limited suite of resources. It is not wise to pursue specific function more precisely on the basis of surface evidence alone.

A total of 21 sites represented in the Reed Collection are placed in this site group and are described in this chapter. An additional site (14SA432) is a much larger site than the rest and has a much more sizeable collection, but it shows the same general characteristics of, and may have been overall contemporaneous with many of, the smaller sites. It may actually be a place where activities similar to those conducted at the smaller camps were repeatedly conducted, leading to an accumulation of debris from many short stays, much like, but probably later in time than, 14SA424 described in the last chapter.

Most sites described in this chapter are in the general Smoky Hill River/Saline River confluence area; a few are beyond in the Smoky Hill River valley or the Mulberry Creek drainage. More are oriented to the Saline River than to the Smoky Hill River, and some are oriented to neither. Given that the rivers obviously have changed channels many times, it is not possible to more accurately assess their orientation, but perhaps what will become clear is that an association with the numerous channel scars in the area is the important factor. The general distribution of the sites is shown on Figure 7.1.

Site 14SA436

Site 14SA436 is about [redacted] At present, the Smoky Hill River is near the south wall of its valley, as it probably also was at the time of the GLO surveys. Site 14SA436 lies on the north (left) side of the river. An old channel scar, which could represent an old meander of either the Smoky Hill River or the



Figure 7.1. Distribution of Sites Described in this Chapter

Saline River, is immediately to the east. Obviously, where the two rivers were relative to the site at the time of occupation is unknown.

Harold Reed located the site in August 1977, according to a note on the bag containing the collection, and completed the site form on January 1, 1980. The site area was a cultivated field in 1977, so Reed was able to estimate or measure the site as extending across an area about 50-×-200 feet, which translates to about 10,000 ft^2 or just under one-quarter acre. He described the site as "abundantly littered" with mussel shell and debitage. The bag suggests that a small quantity of bone and some sandstone may also be present. No concentrations of material or any indications of features were noted. In fact, the original site form contains the remark "probably not much here" and the notes record his "doubt that the site was the scene of very much human activity." It seems unclear how to reconcile these statements, unless it means that much of the visible debris is

mussel shell and that debitage, a sign of human activity (unlike mussel shell can be, but is not necessarily, part of an archaeological assemblage), is scarce.

The collection is limited to ten pieces of unmodified lithic debitage and three small mussel shells (Figure 7.2). All pieces of debitage are grey Permian chert, none of them showing signs of heating. Two pieces are shatter, the others are flakes. Cortex on this material is limited to one surface of one piece of shatter. Striking platforms on flakes, when they remain, usually are flat. The shells are complete, unworked, and unburned.

Site 14SA418

Site 14SA418 lies [redacted] In the present stream configuration, neither river can be said to be closer than the other to the site. A small closed depression shown on the USGS 7.5′ Salina quadrangle just east of 14SA418 could represent a remnant of an old channel of, more likely, the Saline River. That river was closer to the site at the time of the GLO surveys, but, of course, we do not know the position of either river relative to the site at the time of occupation. Site 14SA418 lies at an elevation of about 1190 feet amsl, about 0.6 mile north-northwest of 14SA436.

Reed completed the site form for 14SA418 on November 17, 1971. No supplementary notes are available, leaving the site form as the major source of information. The form describes the site as exposed in a cultivated field and farm yard. It was observed as a scatter estimated to cover probably no more than an acre. Pottery, chipped stone artifacts, debitage, sandstone, and mussel shell were all listed on the site form as observed or collected.

The collection contains 13 objects (Figure 7.3). These include one ceramic rim sherd, one ceramic body sherd, three projectile points, one biface, one retouched flake, five pieces of lithic debitage, and one piece of bone.

The single rim sherd is from a grit-tempered vessel with a direct and probably straight rim. The lip is flat and 7.6 mm thick. The rim exterior is cord-roughened to the lip and is undecorated. The body

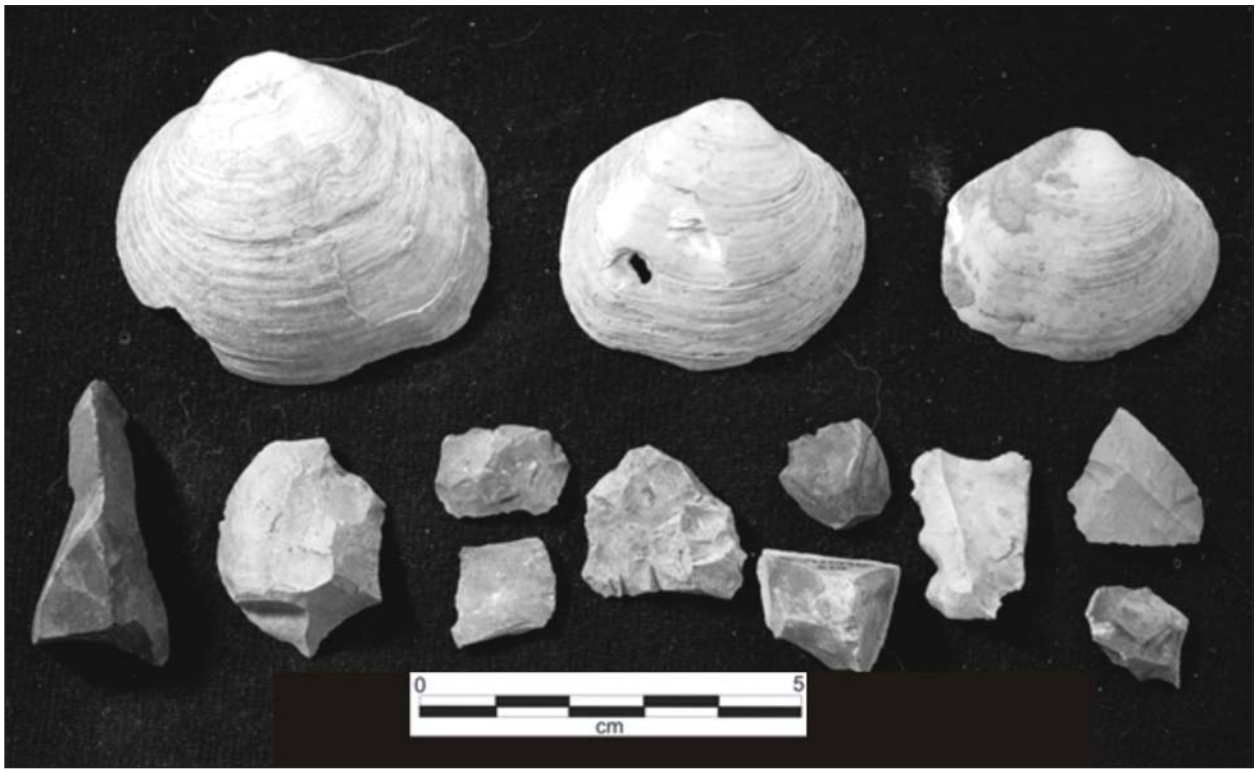


Figure 7.2. Objects from 14SA436

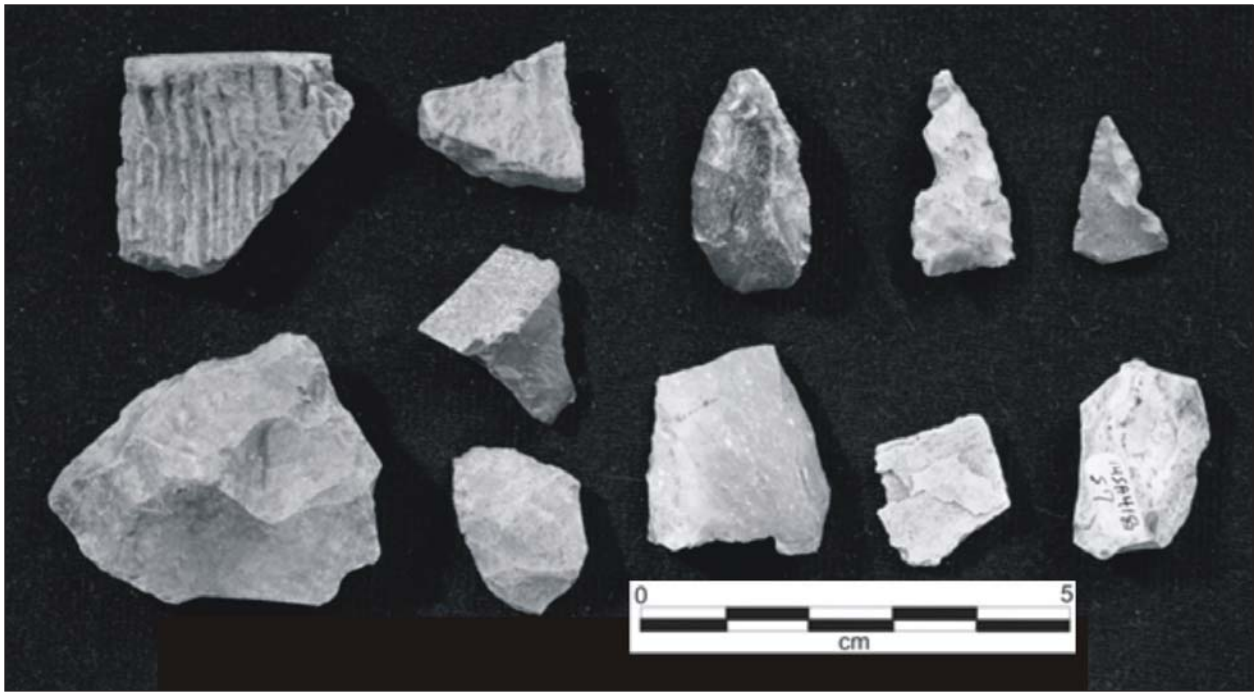


Figure 7.3. Objects from 14SA418

sherd is 5.9 mm thick and also cord-roughened on the exterior.

The projectile points are small late prehistoric arrow points. The most complete of them is a small unnotched triangular specimen of Permian chert. The two indentations on one lateral margin represent damage that probably is from recent cultivation. A second point is the distal portion of the blade of a small arrow point of Permian chert. It too appears to exhibit plow or disc damage. The final point is an unnotched, ovoid specimen of Permian chert. One side reveals a ridge of cortex that would have been impossible to remove. This means the point could not be thinned. Possibly for this reason, it may never have been finished. In addition to these recognizable specimens, a small biface fragment of Permian chert may be from a projectile point blade. If so, it was larger than the arrow points just described.

One piece of a flake of Smoky Hill jasper shows continuous fine marginal retouch. Four pieces of debitage represent either shatter or flakes from early stages of reduction. Three of these are Permian chert, the other is Smoky Hill jasper. A fifth piece is also Smoky Hill jasper and seems to be a portion of a small cobble that perhaps was intentionally split but that was not further modified.

Site 14SA411

Site 14SA411 also lies [redacted] This site lies about 0.6 mile northwest of 14SA418. The Saline River currently is closer to the site than is the Smoky Hill River. The same appears to have been true at the time of the GLO survey. The position some centuries earlier is presently unknown. A closed depression coils around the site location and probably represents an old channel scar of the Saline River. The elevation of the site is 1190 feet amsl, probably on the same landform as 14SA436 and 14SA418.

Reed completed the original site form for 14SA411 on February 20, 1969. At that time, the site area was in a wheat field and was said to cover only about 200 square feet next to the old stream channel scar.[1] Material observed or collected at that time included one projectile point, debitage, and mussel shell. A set of supplemental notes, a portion

1. The site form clearly says 200 square feet. But 200 square feet, or 200 ft², is an area measuring about 14×14 feet. I have seen sites this small, but it seems more likely that the area of 14SA411 was estimated to be 200×200 feet. This is an all-too-common error on site forms completed by any number of people. It is nevertheless a very misleading error, suggesting sites to be much smaller than they really are.



Figure 7.4. Objects from 14SA411

of a paper bag with some notes, and a revised site form completed on January 28, 2000, suggest that Reed visited the site several times over the years and apparently added to the collection. In spite of this, the total collection is small and limited in diversity.

The collection contains ten objects (Figure 7.4), including one rim sherd, one body sherd, two projectile point fragments, one biface fragment, one piece of debitage, one hammerstone, one piece of burned earth, one shell, and one animal tooth. The rim sherd is from a mineral-tempered vessel with a direct rim. Neither the very flat, 7.8 mm-thick, lip nor the rim are decorated. The exterior is cord-roughened to the lip. The single body sherd also is mineral-tempered with a cord-roughened exterior. It is 6.8 mm thick. The rim sherd and body sherd are not from the same vessel.

One projectile point is a nearly complete specimen with a short, corner-notched, haft element. Its distal end is missing due to an impact fracture. The point is made of heat-treated Permian chert. The other point is a blade fragment of Permian chert that is not heat-treated.

The single biface is a rather amorphous fragment of an original of unknown shape. It is thin, however, suggesting it was a small artifact to begin with. The single piece of debitage is a piece of shatter with cortex on one face. The raw material is heat-treated Permian chert with a very similar appearance to the nearly complete projectile point.

The hammerstone is a small and smooth quartzitic cobble. Some battering on the ends possibly is from use as a hammerstone, usable on pieces that have already been partially reduced.

The burned earth shows evidence of having been formed around a cylindrical object such as a pole.



Figure 7.5. Objects from 14SA429

Its surface, however, does not reveal impressions of bark, as is common on true architectural daub. Nor does the piece have any grass impressions on any surface. It does not seem likely that it was from a structure.

Finally, the single mussel shell is a complete valve of a small animal. It is unmodified. The tooth is a partial molar from a deer.

Site 14SA429

Site 14SA429 also lies on the [redacted] The Smoky Hill River is closer to the site than is the Saline River at the present time. The upstream apex of a tight meander loop of the Smoky Hill River currently is about 700 feet southeast of the site. In 1858, when the GLO plat was drawn, the two rivers were about equidistant from the site and the meander loop did not appear. The positions of the rivers relative to the site at the time of its occupation, of course, are unknown. The site lies at an elevation just above 1190 ft amsl.

Reed's original site form for 14SA429 is dated August 27, 1977. At that time, the site was described as extending across about half an acre in a wheat field. Pottery, debitage, shell, and some Euroamerican historic debris was collected. Two sets of catalog entries suggest that Reed visited the site at least one other time, collecting debitage, a scraper, shell, and bone. The original site form suggested probing to look for lodge remains "if any," but by February 1983, Reed recorded in his notes that the site "is just a scattering of cultural debris and probably does not indicate much more than short term use. . . ."

The collection (Figure 7.5) contains 37 objects, eight of which are recent Euroamerican historic objects (metal, glass, porcelain, stoneware). The 29 objects from the earlier occupation include two rim

sherds, four body sherds, one chunk of burned earth, one endscraper, 13 pieces of unmodified debitage, two pieces of bone, four unmodified freshwater mussel shells, and two small pieces of unmodified rock.

One mineral-tempered rim sherd retains very little of the actual rim below the lip, and is too short and fragmentary to be diagnostic. The other rim sherd is from a direct rim vessel, with a rounded and undecorated lip. The remaining portion of the rim is not complete but enough remains to show that the vessel had a smooth exterior and was not decorated. This sherd has no remaining visible temper but it does have an extensive amount of fine sand so well mixed with the paste that it seems more likely that it was part of the source sediment than that it was deliberately added. Two body sherds are cord-roughened, one is smoothed-over cord-roughened, and the other retains too little of the exterior to be able to identify the exterior surface treatment. A final piece of ceramic material is called daub in Reed's catalog, but it has no grass or wood impressions and is better described as burned earth.

The single endscraper from Reed's second visit to the site is the only formal chipped stone tool in the collection. It is a complete specimen made of heat-treated Florence A chert. Both lateral margins and the distal, or working, edge were formed by a single but continuous row of small flakes. The dorsal surface is keeled.

The 13 pieces of unmodified lithic debitage makes this the largest single object class represented in the collection. At least five of the largest flakes retain large amounts of cortex and are from the same Permian chert nodule. The remainder are also all Permian chert, one of them heat-treated Florence A. They are smaller than the first five and retain little or no cortex. Two are small pieces of angular shatter; the remainder are from either small cobbles or later stages of reducing an objective piece.

Each piece of bone is from a large mammal long bone, but each is fragmentary and cannot be more specifically identified. One is unburned and is highly weathered. The other is burned to the point of being calcined.

The freshwater mussel shells are partial valves retaining their hinges. All are unmodified.

The two pieces of rock are limestone. They are small and appear entirely unmodified.

14SA423

Site 14SA423 also lies on the floodplain [redacted] The floodplain here features several closed depressions representing portions of old meander scars of the Saline River. How old these meanders scars are is not known at the present time. The 1858 GLO plat map shows this part of the Saline River in pretty much the same position as at present. It is not out of the question to think that the scars represent the river channel at the time of site occupation, but that cannot be demonstrated one way or the other without geomorphic study. Site elevation is a few feet above 1190 ft amsl.

The site form for 14SA423 was completed by Reed's daughter, Debbie, and is dated August 21, 1976. It describes the site as in a cultivated field planted in milo at that time. It also indicates that the site is approximately 100 feet in diameter. The site form also contains the surprising notation that the site "may be a burial area." Reed's supplemental notes of February 1983 expand and clarify this notation by recording that the landowner had told him that he thought there was "a burial here larger than the one at the burial pit [i.e., the Whiteford site or Indian Burial Pit that is just over one-half mile to the south]." Reed went on to record his skepticism: "I have not seen any evidence of this . . . " noting, though, that he had found beads "and that is somewhat unusual on the surface of a middle ceramic site." Beads *do* occur in excavated Middle Ceramic period sites, albeit in small numbers, and in fact occur in the Whiteford site (Roper 2006a:169–174). As to the statement that there was a burial area there larger than at the Whiteford site—there are stories of local jealousies over that operation and its commercial success. This possibly is an instance of how that was expressed.

The 14SA423 collection contains 33 objects (Figure 7.6). This is a diverse assemblage, comprising six body sherds, one piece of burned earth, one projectile point, one endscraper, two cores, seven pieces of debitage, one tested cobble, two sandstone fragments, one bone bead, one piece of unmodified animal bone, one shell bead, one worked shell, and eight unmodified mussel shells.

The six sherds all are thick (6.7 to 12.1 mm),

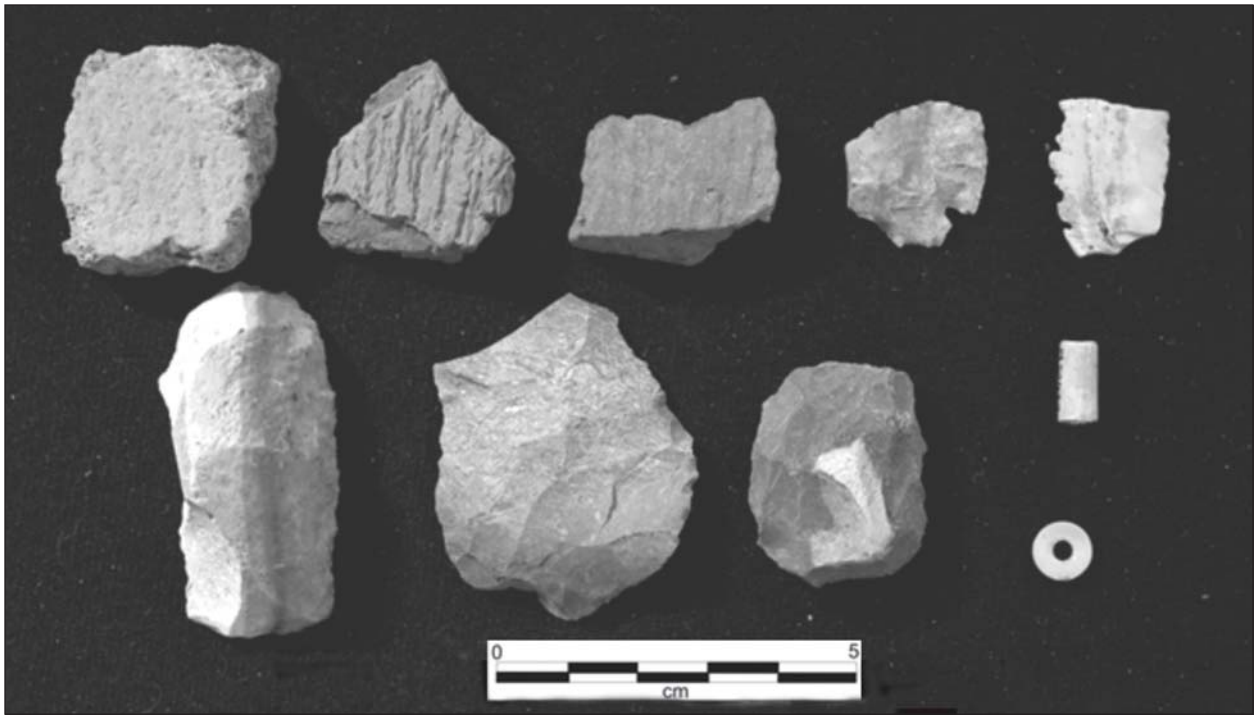


Figure 7.6. Objects from 14SA423

mineral-tempered body sherds. Five of the six are cord-roughened; the sixth is somewhat exfoliated on the exterior but appears to be smoothed-over-cord-roughened. The burned earth is just that—it does not contain grass or stick impressions, which would suggest that it was architectural daub.

The single projectile point is a fairly small corner-notched specimen. Its blade is badly broken, leaving its size and shape somewhat indeterminate. Clearly, however, the blade was wide relative to its overall size, and had prominent barbs. This specimen was made of Permian chert.

The single endscraper was made on a very thick blade-like flake of Permian chert. One side (the left side in the photograph) is entirely cortex that, while reduced somewhat, was not thinned. The distal end and the right lateral margin are formed by steep and continuous rows of retouch flakes.

Two cores are small. One, of Permian chert, is a free-hand, multi-directional core. The other, of Smoky Hill jasper, is a bifacial core.

All debitage is Permian chert. Three pieces are small angular shatter, the remainder are flakes. The largest of the flakes was heat-treated (more properly, the objective piece from which it was derived had been heat-treated). A final piece is a waterworn cobble of Smoky Hill jasper from which a few small flakes were removed.

The sandstone fragments are small and unremarkable. The single piece of bone is not identified except that it is from a mammal. The mussel shells are whole or nearly so, and all retain their hinges. The assemblage is mixed species and all represent small individuals.

The worked piece of mussel shell is a section of the flatter part of a shell and probably from near the shell margin. The edge is irregularly serrated. In spite of the irregularity, all indications are that this is an intentionally worked piece, not a piece damaged by machinery or other post-depositional agents.

The shell bead is a flat disc bead and is complete. A complete bone bead was made by ringing and snapping a tubular long bone, probably from a bird, and then polishing the ends.

14SA451

Site 14SA423 lies about [redacted] Like 14SA423, 14SSA451 lies on a ridge between closed depressions representing portions of old meander scars of

the Saline River. The elevation is above 1190 ft amsl and probably almost 1200 ft amsl.

Reed recorded this site on June 16, 1985, and, in correspondence with the Archeology Office at the KSHS, clarified location data in August of that same year. When recorded, the site was described as a scatter of surface material over an area about 100 feet in diameter. A 100-foot diameter circle would encompass about 7854 ft² or 0.18 acre. No additional notes are available and nothing in the records suggests that Reed ever returned to the site. The site location clarification of mid-1985 was done to resolve the question of whether or not the site was actually 14SA423. It apparently was resolved that it is not, since both sites are listed in the online state site files and they are plotted in separate positions on the master quadrangle maps that accompany the site files. Given that the two sites are separated only by a narrow closed depression that probably represents part of an abandoned Saline River channel, they may actually be parts of a single original scatter that later was bisected by a river channel change.

The 14SA451 collection contains 44 objects under 37 catalog numbers. The collection is not particularly diverse. It is dominated by 24 pottery sherds and also contains one projectile point, one retouched flake, 12 pieces of unmodified lithic debitage, one rock that probably served as a hammerstone, two pieces of bone, two shell beads, and one unmodified mussel shell.

All pottery is undecorated body sherds, one of which has a smooth surface, all the others of which are cord-roughened or smoothed-over-cord-roughened. The sherds span a wide range of sizes, from the 15–20 mm to the 70–75 mm class, with a median value in the 25–30 mm size class. Thicknesses range from 5.8 to 14.6 mm with a median of 8.9 mm.

The single projectile point, made of Permian chert, is a large corner-notched specimen. The overall triangular blade has pronounced barbs over oval corner notches. The base is slightly convex. If a type name is necessary, this is a Snyders point.

The single retouched flake probably is partial. The debitage includes a mix of fractured cobbles, shatter, some early stage reduction flakes, and biface reduction flakes. Other than cobbles, most raw material is Permian chert.

One rock is a well-rounded, albeit irregular, cobble weighing 639 gm. It appears to have battering on several of the projections.

Two pieces of bone are too fragmentary to be identifiable. One piece is burned, the other has some light burning on one end but otherwise is unburned.

The shell is a small, almost complete, valve from a moderately small freshwater mussel.

Two shell beads are made on freshwater shell. One is a disc bead, ca. 12.7 mm in diameter, although with an irregular outline. It is 3.7 mm thick and has a 3.8 mm diameter drilled circular perforation. The other bead is an irregular piece of shell, 12.9 mm in maximum dimension, and 1.7 mm thick, with a 1.9 mm diameter off-center perforation.

14SA448

Site 14SA448 is about [redacted] Site 14SA430 is slightly less than 500 feet to the south-southeast. Reed suggested that 14SA448 is at the edge of a channel scar. As plotted on the USGS quadrangle map, it is at an elevation of 1200 feet amsl. The contour line shown on the map may indicate the edge of a meander scar, or it may be a scarp face, or riser, of a low terrace above a lower surface that does show meander scars. In any event, the site is minimally 2200 feet from the current position of the Saline River and 2600 feet from the current position of the Smoky Hill River and cannot be said to be oriented to either river. It is, of course, possible that the rivers were in a different position at the time of the occupation and that the site was in fact next to one or the other river at that time.

Reed completed the site form for 14SA448 on October 21, 1984. The site is in a cultivated field immediately south of a ditch bordering a county road. It is described as a thin scatter of material extending for about 100 feet south of the road and from the slope of the stream scar (terrace scarp face?) west for about 100 feet. The area, therefore, was listed as about 100 feet in diameter. Reed recommended further surface survey, but also noted that "ideal conditions will be necessary to locate very much." No supplemental notes are available for this site.

The site form indicates that debitage, some sandstone, and some mussel shell were collected from this site and that the same were observed. However,

Reed's records contain no catalog sheets for this site, and no collection seems to exist. The small size, light debris density, and the nature of the site and of the debris suggests it is correctly grouped with the other sites described in this chapter.

14SA430

Site 14SA430 lies less than 500 feet [redacted] Like 14SA448, 14SA430 is not oriented to either the Saline or the Smoky Hill River, or at least the current channel positions of those rivers make the orientation of the sites to a river entirely unclear. At present, the Saline River is about 2800 feet from the site and the Smoky Hill River is about 1900 feet away. The elevation is 1200 feet amsl. Again, though, the contour line shown on the map may indicate the edge of a meander scar, or it may be a scarp face, or riser, of a low terrace above a lower surface that does show meander scars.

Reed completed the site form for 14SA430 on February 26, 1978. The description gives more information on its relation to modern features (road, driveway) than to its natural setting, although it does suggest that the site is adjacent to a meander scar "on a south facing terrace," presumably meaning a south-facing scarp face, or riser, of a low terrace. The site is in a cultivated field and is listed as about 100 feet in diameter. Supplemental notes suggest it is "very similar in size to 14SA429." Reed clearly was hopeful that this was a Smoky Hill phase lodge site when he said in his notes that "I suppose an earthlodge *[sic]* could be found here but I have not seen any good evidence of one." He continued, though, by saying that "I probably should not judge when I have only visited this site two or three times."

Looking for a lodge here might have been wishful thinking since all evidence from the collections and location is that it is one of the numerous aquatic resource extraction camps in this locality. The collection from this contains only 21 objects, including one projectile point, two biface fragments, 16 pieces of lithic debitage, and two pieces of rock.

The projectile point is a damaged specimen that appears to be a small triangular unnotched point. Its distal end was transversely broken by a snap fracture. The proximal end is damaged, with no part of the base remaining. The V-shaped damage to one lateral margin probably is recent damage from a plow or disc. The point is made of Smoky Hill jasper and is not fully diagnostic.

The two biface fragments are edge segments from fairly small, thin original specimens. The larger of the two specimens is Smoky Hill jasper; the smaller biface may be heat-treated Florence A chert.

All 16 pieces of debitage are small. They include five pieces of shatter, all of them Permian chert, one of which may be Florence A chert and, regardless, is heat-treated. The remaining specimens are flakes or flake fragments, all of Permian chert, some possibly Florence A chert.

A small quartzite cobble may have been a hammerstone but, if so, it shows little to no wear or battering and was not extensively used. A small fragment of what appears to be sandstone shows no modification. It actually may be road gravel or railroad clinker.

Site 14SA419

Site 14SA419 is oriented to the Saline River and is the farthest downstream site so oriented. [redacted] Its elevation is between 1190 and 1200 feet amsl.

The site form for 14SA419 is dated December 26, 1972, and is signed by Harold Reed. On this form, Reed described the site area as covering about one-quarter acre. A supplemental note dated February 1983 records Reed's feeling "that a earthlodge *[sic]* could be located here." In a later, undated note on the same page, he revised his opinion: "after later visits to this site, I doubt if a lodge is here. VERY LITTLE material is found here" (emphasis in the original).

Indeed, Reed's collection from 14SA419 is limited to 13 objects (Figure 7.7). These include four ceramic body sherds, one projectile point, one endscraper, one retouched flake, and six pieces of unmodified lithic debitage.

All four sherds are grit-tempered and could be from the same vessel. The sherds include two each in the 15–20 and 20–25 mm size classes—put differently, the largest sherd is about the size of a nickel. The exterior surface, where not spalled away, is smoothed-over-cord-roughened. No decoration appears.

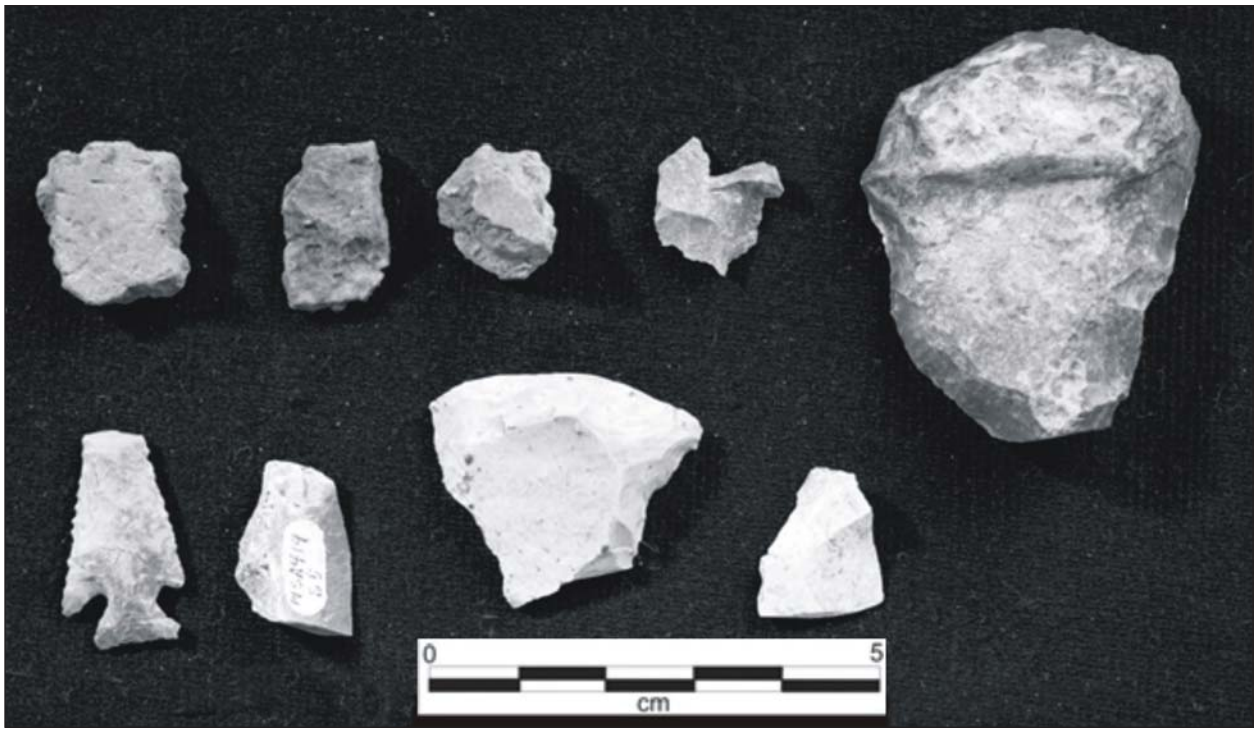


Figure 7.7. Objects from 14SA419

The projectile point is a corner-notched, prominently barbed, expanding stemmed specimen best described as a Scallorn point. The serrated lateral margin is consistent with this identification. The distal end was removed by an impact fracture. The point was made of Permian chert.

The endscraper is a roughly shaped specimen formed on a thin tabular piece of Smoky Hill jasper with cortex on each face. The distal end and both lateral margins were formed by a single but continuous row of retouch flakes—steep on the distal end, less so on the lateral margins. Some step fracturing and edge rounding on the distal end is evidence of at least moderate use.

The retouched flake is a fragment of a larger flake with a single but continuous row of steep retouch flakes on the only remaining part of a lateral margin. The raw material is Permian chert.

All six pieces of debitage are small with three pieces each in the 10–15 and 15–20 mm size classes (thus the largest piece is about the size of a dime). One piece is shatter and another retains cortex, but the other four are from late stages or biface manufacture of maintenance. All flakes are Permian chert.

Site 14SA434

Site 14SA434 is [redacted] The downstream arm of this meander loop actually is the upstream arm of the meander loop with which 14SA419 is associated; thus, the two sites are about 1000 feet apart. Reed described the site as lying on a terrace above a steep river bank. As plotted, it is at an elevation just above 1200 feet amsl on a narrow ridge between the river and a first-order intermittent waterway that may well be an erosion runoff feature created after the land was opened to modern agriculture.

Reed's site form for 14SA419 is dated January 1, 1980. He commented then that the Saline River was washing away the terrace and that most material he found was where the river was cutting into it. He reiterated this in a supplemental note dated February 1983, suggesting at that time that the site was "probably pretty well washed away." Looking at how it is plotted on quadrangle maps, i.e., its position on a narrow ridge of the terrace between the river and the drainageway, suggests that the site may have suffered erosion from each side. Thus,



Figure 7.8. Objects from 14SA434

the 50-×-100-feet (ca. 5000 ft^2 = 0.11 acre) almost certainly is an underestimate of the site's original size. The point now is moot, however, for another of Reed's notes, this one dated 1999, says that the site had been totally destroyed by a land-leveling operation.

Reed's collection from 14SA434 contains 43 objects (Figure 7.8), including three small ceramic body sherds and 40 pieces of unmodified lithic debitage. All three sherds are small, 25 mm or less in maximum dimension, mineral-tempered sherds, probably with cord-roughened exteriors. All pieces of debitage are Permian chert, most of it heat-treated Florence A. At least 11 pieces are shatter, usually small pieces that retain a considerable amount of cortex. The remaining flakes are small, with most falling into the 10–15 or 15–20 mm size classes and none larger than 25 mm in maximum dimension. It is possible that all or most flakes are from a single nodule of raw material.



Figure 7.9. Objects from 14SA440

Site 14SA440

Site 14SA440 is one of several lower Saline River valley sites that are associated with a series of old stream channel scars lying away from the current river channel. It lies north of the current position of the Saline River, but on the south side and in the meander loop of the old channel scar, at an elevation just above 1200 ft amsl.

Reed completed two site forms for 14SA440. The first, dated October 19, 1981, reported the site to be in a cultivated field, to be about 100 feet in diameter, and to have "abundant mussel shells." The second site form was dated February 5, 1983, and gave essentially the same information, except that the site area was estimated as one-half acre or less. Although technically consistent, since a 100-foot diameter area, at just under 0.2 acre, certainly is smaller than one-half acre, these two estimates also are somewhat discrepant, possibly due to the site appearing differently at different times.

The collection from 14SA440 is limited to eight objects (Figure 7.9). These include one ceramic body sherd, one piece of unmodified lithic debitage, one piece of animal bone, and five freshwater mussel shells. The body sherd is mineral-tempered with a cord-roughened exterior. The single piece of debitage is a complete flake of Permian chert. The piece of bone is a heavily burned fragment of a long bone from a large mammal, possibly deer. The mussel shells are fairly complete specimens from small individuals.

Site 14SA443

Site 14SA443 lies about 1000 feet southwest of 14SA440. Like 14SA440, 14SA443 is north of the present position of the Saline River but south of, and on the inside of, a meander loop of an old stream channel scar. The elevation is just above 1200 ft amsl.

The site form for 14SA443 is dated February 5, 1983. At that time, Reed described the site as extending across one-quarter acre or less. He listed the objects he collected and then, under the "material observed" heading, he reported that he "picked up all I saw—not much here."

The collection is limited to six specimens, including two ceramic body sherds, two pieces of bone, and two mussel shell valves. The sherds are small

and each is mineral-tempered. One has a smooth surface; the other is cord-roughened. The two bone pieces are very small, heavily burned and partially calcined, fragments. They probably are from fairly large mammals but cannot be more certainly identified. Both mussel shells are nearly complete and are from small individuals.

Site 14SA442

Site 14SA442 is not quite one-half mile upstream from 14SA440 and 14SA443. Like them, it is north of the current channel of the Saline River and is associated with old stream channel scars. In this case, it is between two scars. Its elevation is just above 1200 ft amsl.

The 14SA442 site form is dated February 5, 1983. Reed described the site as covering less than one-quarter acre in a cultivated field. He noted that material was widely separated "and requires ideal conditions to find anything." He made a small collection of pottery, debitage, bone, and shell, and observed more debitage, bone, and shell.

The collection is limited to seven objects, one of which is a lead rifle slug obviously not associated with the main occupation. One small body sherd has a mostly spalled-away exterior but the fabric and manufacture show its similarity to pottery from other sites in the area.

One small piece of burned earth has a mass of 1.02 gm. Three pieces of debitage include a split cobble covered with cortex on the dorsal surface and two small (10–15 mm) flakes of Permian chert. One of the latter was heat-treated. A small fragment of bone is from a large mammal. It is not burned, but it is heavily rodent-gnawed.

Site 14SA433

About 1400 feet to the northwest of 14SA432 lies 14SA433. It is plotted as lying adjacent to the same old stream channel scar as 14SA432 and 14SA442 and, like 14SA432, is on the outermost side of this channel scar. Its elevation is 1200 ft amsl.

Reed's site form for this site is dated January 1, 1980. Although the site is described as being in a cultivated field, Reed had this to say about it: "Material is hard to find except under good to ideal conditions. With patience one could find occasional flakes all along the edges of the old stream scar." But the site must have appeared differently at different times. In a supplemental note of February 1983, Reed's exasperation is evident: "Now this one is really thin. I found a nice point here but even the flakes are scarce." In August 1984, though, he reported that it "Looks better after a good rain." Whether he ever revised his 1980 assessment that the site covered one-half acre or less is not recorded.

Reed also mused in his August 1984 note that there were a lot of little sites around this stream scar. As we see in this chapter, that is a correct observation. As we have already seen and will continue to see, the collections from these sites typically are small. The collection from 14SA433, with its 50 objects is, therefore, a rather large collection for one of these sites. Its contents are summarized in Table 7.1.

The small number of pottery sherds (Figure 7.10) includes three rim sherds. One of these is so small and so badly eroded on the exterior surface as to leave the thin remaining part of the lip nearly indiscernible and the sherd or vessel indescribable. The other two rim sherds are each from a separate vessel. One of them was a thick-walled pot that probably had no constriction, or neck. The rounded lip is 9.2 mm

Table 7.1
Collection Contents—14SA433

Material class	Object class	Count
Ceramic		
	Rim sherd	3
	Body sherd	10
Chipped stone		
	Projectile point	3
	Biface	3
	Endscraper	4
	Retouched flake	3
	Debitage	18
	Core	1
Groundstone		
	Hammerstone	2
Rock		
	Unmodified sandstone	1
Bone		
	Unmodified animal bone	2

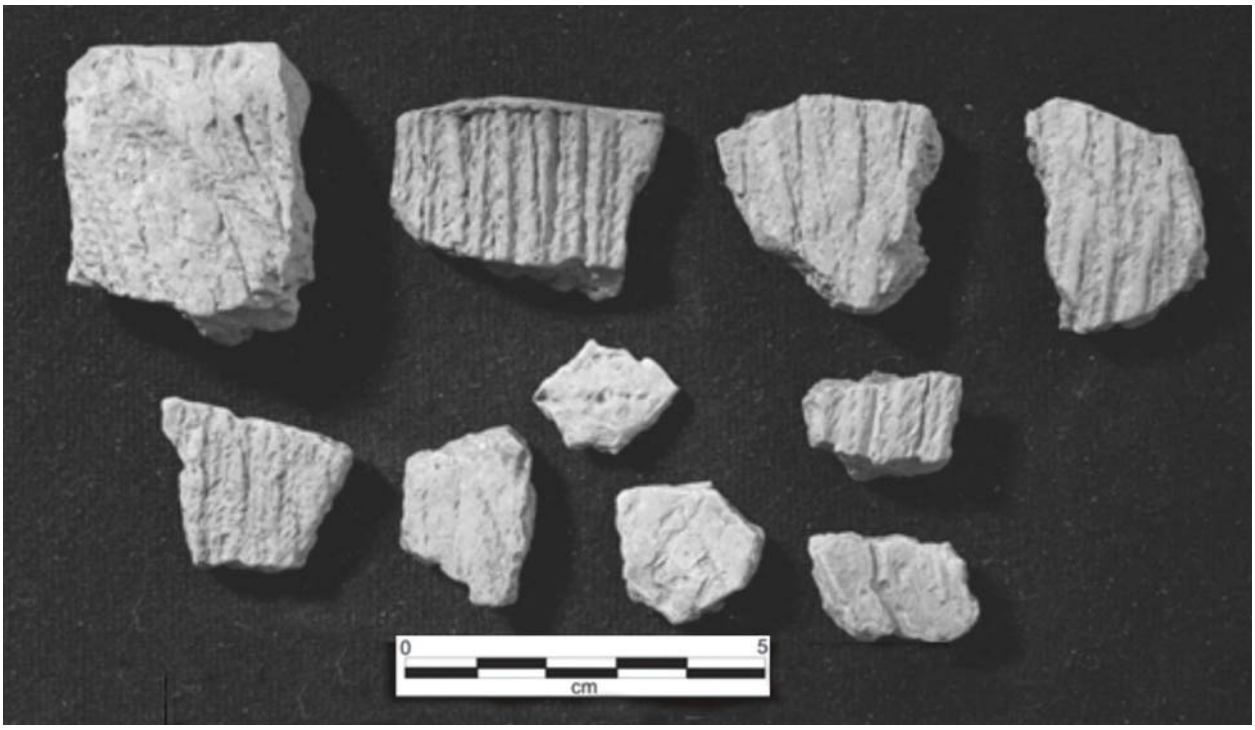


Figure 7.10. Pottery from 14SA433

thick and the vessel wall at the lowest preserved end of the sherd is 13.4 mm thick. The exterior surface has oblique but irregular cord-roughening, somewhat smoothed-over. Neither the lip nor the rim is decorated. The other rim sherd is from a thinner-walled vessel. The profile exhibits slight curvature, suggesting a jar with an only slightly constricted neck. The somewhat rounded lip is 3.5 mm thick and the vessel wall at the lowest end of the sherd is 6.5 mm thick. The exterior surface is cord-roughened, with regular and fairly deep, evenly executed cord-impressions that extend to, but not onto, the lip. The lip and exterior are undecorated.

Seven body sherds from this site range from 5.3 to 8.3 mm thick, with a median of 6.9 mm. The other two have eroded exteriors. One exterior from the neck area of a vessel is smoothed. All other exteriors are cord-roughened, but never as obliquely as on the second described rim sherd nor as regularly as the last rim described.

Three projectile points include only one identifiable specimen (Figure 7.11). It is a small corner-notched, stemmed, specimen, SCa1 in the Strong (1935:88) classification system or, perhaps loosely, Scallorn in common typological nomenclature. It was made of Permian chert. The other two specimens are each distal blade segments with no part of the haft element present. Each, however, is from a point in the same size range as the Scallorn point. One is Permian chert, the other is Smoky Hill jasper.

Three bifaces are each end segments of their original pieces. Two are pointed, although likely not from projectile points. One is a squared end segment. All are Permian chert.

Two of the four endscrapers are complete or nearly complete tools on fairly large, thick flakes of Permian chert. The other two, one complete and one a distal end only, are Smoky Hill jasper. The complete specimen is keeled and was made on a moderately large, thick flake; the broken piece is from a thin flake. These scrapers would not be completely out of place in a late prehistoric assemblage, but the two of Permian chert, in particular, would stand out in such an assemblage. In fact, neither would be totally out of place in some of the Paleoarchaic assemblages discussed in Chapter 6.

The retouched flakes and debitage are a mixed lot of Permian chert (ten pieces of debitage and two



Figure 7.11. Chipped Stone Objects from 14SA433

retouched flakes), Smoky Hill jasper (seven pieces of debitage and one retouched flake), and unidentified chert (two pieces of debitage) at least one of which probably is from a cobble. Three of the Permian chert objects, including both retouched flakes, are in larger, 50 mm or greater, size classes, while no Smoky Hill jasper piece is larger than 35 mm in maximum dimension. Further, at least three pieces of Permian chert are shatter, whereas all Smoky Hill jasper pieces are reduction flakes. While neither of these raw materials occurs in the study area, the primary source of Permian chert is considerably closer than is the primary source of Smoky Hill jasper. Further consistent with this impression that Permian chert was coming into the area at this time as larger blocks of material, the single core also is Permian chert. At 65.67 gm and less than 60 mm in maximum dimension, it is rather small for a core, but it also may be largely spent.

Two cobbles (cobbles, by definition, measure 64 to 256 mm in maximum dimension; each of these is within that range) seem to show battering on their ends and probably are correctly identified as hammerstones. One piece of sandstone is near the upper end of the pebble size class (4 to 64 mm, by definition) and appears entirely unmodified.

The collection includes two small pieces of bone. One is burned to the point of being calcined, the other is unburned. While each is too small to be identifiable, the unburned piece at least can be said to be from a long bone of a large to very large mammal.

Site 14SA446

Site 14SA446 is adjacent to the Saline River on the north (left) side. [redacted]

Reed completed the site form for 14SA446 on February 5, 1983. He described the site then as extending across less than one acre in a cultivated field. There are no supplemental notes or other descriptive information for this site.

The collection is composed of everything Reed saw when he recorded the site and is limited to ten objects. These include three ceramic body sherds,

two flakes, and five bone fragments. The small body sherds are mineral-tempered, cord-roughened sherds measuring 4.0 to 5.9 mm thick. The flakes are one each of Permian chert and a fine-grained quartzite. The bone fragments include one small fragment of turtle carapace and at least three fragments of mammals (the fifth fragment is too small to permit an identification). Two of the mammal bone fragments are burned.

Site 14SA441

Site 14SA441 is one of only a few sites that Reed recorded that lies on the south side of the lower Saline River. On the other hand, the site lies between the current river channel to the north and an old channel scar to the south, so it is possible, although not demonstrated, that the occupation was on the north side of the river. The elevation is 1200–1210 ft amsl.

Reed completed the site form for 14SA441 on February 5, 1983. The site is described as being in a cultivated field and occupying "over an acre or so." The material is described as "widely scattered." No supplemental notes are available for this site.

The 14SA441 collection contains 17 cataloged objects, including one ceramic body sherd, one retouched flake, ten pieces of debitage, two bone fragments, two freshwater mussel shells, and one piece of sandstone (Figure 7.12).

The single small sherd is mineral-tempered and cord-roughened. The retouched flake is a fairly large and thin flake with a single continuous row of retouch flakes on the dorsal surface. Of the ten flakes, nine are Permian chert, some of it with cortex. The tenth flake is an unidentified tan chert with some cortex.

The bone fragments are from mammals that are not more specifically identifiable except insofar as at least one was from a large mammal. One bone fragment is burned. The two mussel shells include one with and one without its hinge. Both represent fairly small individuals.

The sandstone is a coarse material. Its angular shape suggests that it may be fire-cracked.



Figure 7.12. Objects from 14SA441

Site 14SA425

Site 14SA425 lies north of the Saline River, in the neck of a meander loop of the river as it currently is configured. [redacted] Contour lines on the USGS 7.5′ map appear to map the former creek channel just to the west of 14SA425. The site lies at an elevation just above 1210 ft amsl.

Harold Reed's site form for 14SA425 is dated November 2, 1976. At that time, he described the site as covering "probably not more than 2 acres." Reed did, however, note that flakes were widely scattered to the northwest. A supplemental note dated February 1983 suggests that considerable debitage, but few tools, were observed on the surface and seems to say that some concentrations of material were observed.

The 14SA425 collection contains exactly 100 objects cataloged under 91 numbers. The difference is ten small body sherds and one small piece of burned earth lotted under two numbers. Table 7.2 shows the breakdown of these objects by material class and object class.

Table 7.2
Collection Contents—14SA425

Material class	Object class	Count
Ceramic		
	Body sherd	23
	Burned earth	1
Chipped stone		
	Projectile point	20
	Biface	5
	Endscraper	4
	Retouched flake	13
	Debitage	27
	Core	1
	Split cobble	2
Rock		
	Unmodified rock	2
Bone		
	Unmodified animal bone	2

The pottery (Figure 7.13) is limited to body sherds, most of which are in the 10–15 mm through 30–35 mm size classes, with the largest single number in the 15–20 mm class. The pottery is tempered with fairly sparse quantities of rounded coarse sand. Of the 23 sherds, 21 have cord-roughened exterior surfaces, while the other two have smooth surfaces. Thicknesses of 16 sherds for which thickness is complete (the remainder are eroded on one or both surfaces) range from 5.6 to 8.7 mm with a median of 7.35 mm. One sherd with an eroded thickness is minimally 9.5 mm thick. No sherd is decorated.

Chipped stone objects form the majority of the 14SA425 collection. In some ways, parts of the collection were difficult to sort into the usual object classes because there is some ambiguity of defining characteristics for some objects. Remember that chert does not crop out in the CKRA and that all cherts represented in the collections from this area were brought to it from some distance. In this particular instance, the suite of raw materials is somewhat diverse. Permian chert from the Flint Hills, normally the predominant raw material in collections from this area, is represented but forms a minority. Florence A chert from the southern end of the Flint Hills also is present. A few objects are Smoky Hill jasper from primary sources to the west and a few other objects may be cobbles from gravel sources. A surprising number of objects, however, are not identified. Some of these materials may be from sources in or near the Ozarks to the southeast of the CKRA. The 20 projectile points (Figure 7.14) can be sorted into three groups and a residual group containing unidentifiable fragments.

One group is composed of five triangular unnotched points of varying size. These specimens exhibit reasonably straight to convex lateral margins and convex bases. One face on each of three of these points exhibits only marginal retouch. The second group contains eight specimens. These are small, almost tiny, corner-notched points. With one exception, the bases are convex; the exception has a straight base. Notches are very narrow and short. Blade lateral margins are straight to convex. The third group is defined as points that are side-notched with a straight base, but only one specimen is assigned to this group. The final six specimens are medial or distal sections of point blades and cannot be further identified.

Five bifaces also are small specimens, and only



Figure 7.13. Pottery and Chipped Stone Objects from 14SA425



Figure 7.14. Projectile Points from 14SA425

two of them are complete. Each is an irregular ovate piece. The other three are fragmentary, and it is not really possible to determine the original form.

Four endscrapers include three complete or nearly complete specimens and one that represents only the distal, or working, end (Figure 7.13). These are moderately small, thin scrapers on flakes. They could be said to have a keel, but it really is only a ridge between scars of previous flake removals in a direction paralleling that of the flake used for making the scraper.

Thirteen retouched flakes are of varying size, and include the largest of the tools in this site's collection. Most of these are blade-like flakes with continuous rows of retouch on the dorsal surface of each lateral margin.

The debitage represents a variety of raw materials and several stages of material reduction. This includes cobble fragments and some shatter or cortex flakes, as well as later stage biface reduction flakes.

Two other chert objects are fractured cobbles and a final chipped stone object could be called either a fractured cobble or a core made on a cobble. Flakes removed from this piece probably could have been large enough to manufacture a small point such as are common at this site. It also is possible that the knapper was attempting to manufacture a small biface.

The material class rock contains two objects, each of which is unmodified. One is a small (2.87 gm) waterworn piece of limestone. The other is a broken granite cobble. It has a smooth exterior where not fractured and could be from a tool, but it exhibits no definitive evidence of human modification.

Two pieces of bone are each very small, with masses less than one gram. One is a fragment of a mammal tooth, the other is a small fragment of a bird long bone.

The 14SA425 collection does not give the impression of a single occupation by a definable group of people, such as, for example, a family unit occupying a lodge site for a period of years. Instead, it gives the impression of a place that was periodically used for short intervals of time and possibly not always by the same individuals. In this case, the site may represent an accumulation of occupations very similar to those represented at the small sites with light debris scatter described in this chapter.

Site 14SA452

Site 14SA452 occupies a position adjacent to an abandoned meander scar of the Smoky Hill River. As with other sites similarly located near channel scars, it is not possible at present to know if it represents the channel active at the time of site occupation, or if it was already an abandoned channel position at that time, or, for that matter, if the channel was created subsequently to the occupation. In any event, the site is a couple hundred yards west of the current river position, on a terrace at an elevation just above 1250 ft amsl.

The site form is dated June 4, 1999, and was completed by Harold Reed. It appears that this actually is an isolated find of one end of a large biface. It was found about six feet below the surface. Reed said he cleaned the bank edge of the channel scar without encountering additional cultural material. Obviously site area was undetermined—or, if this really was an isolated find, site area could be stated as less than 1 ft^2. No supplemental notes are available, so it is not possible to determine if Reed ever again inspected this location. No additional information about the site is available.

The site form indicates that Reed collected the biface section he observed when he recorded the site. It does not appear to be in the collection.

Site 14SA428

Site 14SA428 is about one-quarter mile upstream from 14SA427. Like 14SA427, 14SA428 is immediately adjacent to the river on the east side, but, unlike 14SA427, 14SA428 lies on a slightly higher, older, and somewhat eroded landform with a gently rolling surface. It actually is on a high point on a gentle knoll of that landform at an elevation at and slightly above 1320 ft amsl. This places it about 40 feet higher in elevation than 14SA427 and about 60 feet above the river level.

This site form is dated February 26, 1978, and is signed by Harold and Debbie Reed. It reports the site as covering 6 to 8 acres in a cultivated field, but it also says that material is widely scattered in that area. No supplemental notes are available. Further survey is recommended.

The 14SA428 collection contains 25 objects (Fig-



Figure 7.15. Objects from14SA428

ure 7.15). Two of these are ceramic body sherds. Each is a small mineral-tempered piece; one has a cord-roughened exterior, the other has a smoothed-over cord-roughened exterior. This latter also appears to have an orange wash or slip, but it is more likely that it actually is simply a thin oxidation rind. The cord-roughened piece has some large voids, representing the position of now-leached temper particles. This is not unique to this site, instead appearing in the pottery collections from several other known sites in the southern Saline County/northern McPherson county area, including 14MP407 (Bevitt 2006 described the site but not this characteristic of the pottery; I have reanalyzed some of the pottery and noted this characteristic then) and 14MP311 (a collection curated at the KSHS that I also have reanalyzed) and several others in the Reed collections. I also have examined some thin sections from sherds of this class of pottery, observing that the large temper particles are limestone or sometimes bone, either of which is susceptible to leaching in acidic soils. More will be said about this in Chapter 10, but at this point it might be noted that this pottery fabric class is most strongly represented in sites near the southern end of the north-south segment of the Smoky Hill River and upstream, or, in modern geographic terms, in the Bridgeport to Lindsborg area.

The other 23 objects in the collection are chipped stone: three projectile points, three bifaces, three endscrapers, seven retouched flakes, and seven pieces of unmodified debitage. The three projectile points include the proximal portion of a side-notched specimen, a proximal corner segment of a thick (relative to overall size) specimen whose notch placement borders on corner-notched, and a diamond-shaped, very thick (again, relative to overall size) specimen that may actually be a reworked distal section of a once larger pointed biface. All three bifaces in the collection are segments of larger originals, all of indeterminate original size. Each of the three scrapers also is fragmentary. With the possible exception of the diamond-shaped point, all objects are Florence, sometimes Florence A, chert.

All retouched flakes and pieces of unmodified debitage also are Florence or Florence A chert.

Site 14SA417

Site 14SA417 is an outlier relative to the main survey area that Reed covered during his collecting activities. It lies in the Mulberry Creek valley in western Saline County, [redacted] Its elevation is between 1370 and 1380 feet amsl on a terrace on the north (left) side of the creek. This is a narrow stream valley, with a long gentle slope leading to the bottoms from the north and west, and a steep and fairly narrow bluff on the south and east sides of the creek. This bluff is ridged and rises over 200 feet above the valley. Reed's notes say that it is locally known as the Devil's Backbone and, in fact, he refers to the site as the Devil's Backbone site.

Reed completed the 14SA417 site form on February 21, 1971. He described the site as in a cultivated field and indicated that the material was "scattered." The entry under the Area of Site heading reads "uncertain." Reed's supplemental notes from 1983 record that he had been to the site only once and that was in the early 1960s. He mused in those notes that he "need[ed] to return for a better understanding of the site." If he ever did that, however, he left no record of it.

The collection from this site is limited to six objects. Two ceramic body sherds are each smaller than a nickel. Each sherd is thin and mineral-tempered, and has a smoothed-over cord-roughened surface. Three scrapers are all fragments. One of them is the proximal portion of a large, but proportionally thin, specimen of Permian chert. This piece was burned and exhibits both smoking on the surface and a large potlid fracture on the ventral surface. A second piece is a corner segment of a Permian chert specimen. The third is a comparatively small proximal section of a specimen made of Smoky Hill jasper. Beyond the pottery and scrapers, the final object in the collection is a piece of rock with a mass in excess of 200 gm. It appears to be hematite or ochre with some sandstone matrix. That is possible within the Dakota sandstone. This particular piece does not appear to have been humanly modified.

Site 14SA439

A second outlier in the Mulberry Creek drainage is 14SA439, a site that lies in the valley of Spring Creek, a major tributary of Mulberry Creek. The location is [redacted] Spring Creek, West Spring Creek, and Ralston Creek all come together in this area. Spring Creek flows to Mulberry Creek about seven miles downstream (to the northeast). With the converging creeks, the overall site area is comparatively broad, considering how high it is in the drainage network. The site is on a terrace on the east (right) side of the creek, at an elevation of 1300 to 1305 ft amsl.

The collection records contain a folder for 14SA439. The site form, dated July 5, 1980, was, however, completed not by Harold Reed or a member of his family, but by Cleve Mulder. Whether Reed and Mulder were working together or whether Harold thought it a site he might be interested in further investigating is not recorded. The latter is plausible because the form records the recommendation for additional survey. On the form, the site is described as covering an area of 100-×-200 feet (20,000 ft^2 = 0.46 acre) in a cultivated field.

Reed has no collection from 14SA439, nor does the site folder contain a catalog page for this site. The site form enumerates a collection made at the time the site was recorded. Presumably this either is with Mulder or has gone elsewhere. It includes pottery, chipped stone objects, a hammerstone, and animal bone. The pottery is described as calcite-tempered. No additional information is available about the site or its assemblage.

14SA432

Site 14SA432 is only about 300 feet north of 14SA442. While it is minimally about 1600 feet from the present position of the Saline River, it lies on the northeast side of the northernmost channel scar of a complex of old Saline River channel scars—in other words, it is on the outermost edge of the complex of channel scars. This channel scar could have represented the channel at the time the site was occupied, although it would take some geochronological investigations to determine that. The

site itself lies on the terrace at an elevation just above 1200 feet amsl.

Reed's site form for 14SA432 is dated January 1, 1980. He described the site as extending across about two acres in a cultivated field. He noted, however, that the material was "rather widely scattered and only after a good rain can any concentrations of cultural material be found." A supplemental note dated August 15, 1981, suggests that the site "probably contains a structure" although it does not give the basis for that supposition. Reed also "noticed an area of burned earth and bone about 10 foot in diameter at the south edge of the chert concentration, this may locate a hearth." The January 1, 1980, site form lists the cultural affiliation as Early Ceramic. A supplemental note of February 1983 reports finding Early Ceramic points here. A final, updated, supplemental note indicates that he had found tools and pottery "deep in the stream scar." It is not clear from the description if these were eroding from the scarp leading to the channel scar or maybe represent slope wash into the scar. If the former, it might imply either that the site was/is shallowly buried in the alluvial sediments or that it contains multiple, stratified components. If the latter, it means that the area of scatter has been enlarged by alluvial processes. New field work at this site would be justified.

Reed's collection from this site is extensive, containing 281 objects. These are summarized on Table 7.3.

Table 7.3
Collection Contents—14SA432

Material class	Object class	Count
Ceramic		
	Rim sherd	7
	Body sherd	56
	Burned earth	3
Chipped stone		
	Projectile point	73
	Biface	51
	Drill	3
	Scraper	12
	Retouched flake	7
	Core	1
	Debitage	50
Groundstone		
	Sandstone	1
	Whetstone	1
Rock		
	Fire-cracled rock	6
	Unmodified rock	3
Bone		
	Rod	1
	Unmodified bone	4
	Tooth	2

The pottery collection from 14SA432 contains seven rim sherds and 56 body sherds (Figure 7.16). All rim sherds are small direct rim sherds from vessels of unknown form. The lips are smooth-surfaced and undecorated. Exteriors are cord-roughened to the lip and undecorated.

The body sherds could be from the same class of vessels as produced the rim sherds, but they also give no indication of vessel form. All but one are cord-roughened and the exception has an eroded surface and is indeterminate. Decoration is uniformly absent. Sherd thicknesses range from 5.2 to 10.7 mm with a median of 7.7 mm.

Three catalog numbers are assigned to burned earth but the number of chunks is somewhat greater than that. The aggregate mass of the material is 65.52 gm. None of this material retains any timber or grass impressions, nor is it necessarily compacted. It is not architectural daub.

The projectile points constitute a very mixed lot but all specimens are broadly assignable to the Ceramic period and cover a large part of it. The earliest of all the points are three specimens that might generally be called Snyders points (Figure 7.17). These are medium-large points, used on spears or darts but not arrows. They are corner-notched with convex bases and triangular blades with pronounced shoulders or barbs. All three specimens are of Permian chert. Another point, of Smoky Hill jasper, might be the blade of a fourth Snyders point, broken across the neck. An anomalous specimen might be something of a variant on the Snyders form. The haft element of this point is damaged, but enough of it remains to show that the point was corner-notched with notches smaller in proportion to overall point size than Snyders normally are, and with a narrow neck and base. The blade is broken but the remaining portion reveals highly convex lateral margins with shoulders that likely were dis-



Figure 7.16. Pottery from 14SA432

tinct but whether with or without barbs cannot now be determined. The point was made of Smoky Hill jasper or a similar chert.

Three other points also are corner-notched (Figure 7.17 bottom row on left). They are smaller than the Snyders points but still are too large to be considered arrowpoints. Bases are straight, haft element lateral margins converge somewhat to the neck, and blades are triangular with prominent to barbed shoulders. Raw materials used in manufacturing these points are nearly white cherts probably from primary sources to the east of the study area and to the east of the Flint Hills.

The most common point class represented here is composed of small corner-notched points that are true arrow points (Figure 7.18). If we had radiometric data in secure association with these points, at this site or elsewhere in the CKRA, we probably would know when the bow and arrow was adopted locally. The individual specimens vary considerably in form. As a generality, the corner-notches are deep relative to the overall point size, bases are straight to slightly convex, blades are an isosceles triangle with prominent barbs on the proximal corners. Blade lateral margins are variably straight to somewhat convex. Most raw material identifications are uncertain, but it appears that heat-treatment is common. Two variants among these small points are notable. One of these variants is composed of very small points with very small corner-notches. Another variant is similar in size to the main group but the notches and shoulders are less distinct.

Two points are small triangular side-notched points (Figure 7.19), each of them manufactured of Permian chert. These might be the latest of the points on this site.

Several points lack notches but otherwise are variable in overall form (Figure 7.20). Cherts are variable but include one of Smoky Hill jasper and one that is almost certainly Knife River flint. This raw material comes from a primary source area in central North Dakota. A look-alike (or a look-quite-a-bit-but-not-exactly-alike) from southwestern South Dakota lacks the detrital plant material



Figure 7.17. Large and Medium Corner-Notched Points from 14SA432



Figure 7.18. Small Corner-Notched Points from 14SA432



Figure 7.19. Side-Notched and Unnotched Points from 14SA432

that is a distinguishing characteristic of true Knife River Flint and that appears in this point.

The final group of points is composed of fragments not identifiable to any of these other groups. Raw materials and heat-treatment are consistent with the other specimens.

The bifaces of 14SA432 are a very mixed lot (Figure 7.20) and, unfortunately, many are too fragmentary to enable a determination of the original form. The largest and most complete of them are long relative to their widths with blunt points on one end and on the other end exhibiting convex



Figure 7.20. Bifaces from 14SA432

margins and subrounded points of juncture with the straight-to-convex lateral margins. Of the two complete specimens, one is Permian chert, and one is Smoky Hill jasper.

Distinctly noticeable in the collection are numerous small, vaguely circular or elliptical bifaces. These often are like the corner-notched points and are of mixed cherts from sources to the east. They also are often heat-treated.

Three drills include one hafted drill with a broken shaft, and two shaft fragments, not from this same specimen. The hafted drill is Permian chert. The haft itself is circular and bifacially flaked. The shaft is about 13 mm at the widest. The two shaft fragments are one of Permian chert and one of Smoky Hill jasper. Each is about 13 mm wide.

Scrapers (note the use of the term scraper rather than endscraper, because the form of these objects is somewhat different than is usually associated with the term endscraper) also are a mixed lot. Two heavy specimens, one of Smoky Hill jasper and one on a Permian chert cobble (the dorsal surface is weathered in a manner consistent with the weathering on a stream cobble) are large, heavy scrapers similar to specimens from 14SA424 and 14SA431. Several others, of Permian chert, are on fairly large, thin flakes. One scraper appears to be a repurposed corner-notched point. It was made of a chert that also is well-represented among the corner-notched points and, like them, was heat-treated.

Retouched flakes, a core, and debitage, as is normal, represent a mix of raw materials and stages in manufacture, possibly including evidence of a blade or blade-like flake manufacturing tradition. It is notable that the large, flat biface reduction flakes that are prominent at 14SA424 are largely absent from 14SA432, but then so are the large bifaces that result from this reduction technology. Present instead are pieces of angular shatter, some decortication flakes, and some small reduction flakes. Raw material again is from a primary source to the east and heat-treatment is common.

Groundstone objects on this site are minimal. One irregular block of sandstone has been repeatedly plow-struck, but a couple of narrow grooves may represent sharpening of tool edges. This definitely is neither a mano nor a nutting stone. A flat slab of find-grained sandstone also has narrow grooves and may be a sharpening stone or whetstone.

Other pieces of rock in the collection are not convincing as hammerstones. Some, however, have angular breaks and evidence of having been heated. It can confidently be described as fire-cracked rock. Some small pieces of angular debitage could be argued to also be fire-cracked rock.

Four bone fragments are present in the collection. Three are from bison and include one nearly complete carpal/tarsal, one rib section, and one small fragment of an unidentified foot bone. The fourth piece of bone is a very small (0.40 gm) fragment that probably is from a long bone of a unidentified small mammal. This fragment is burned and partially calcined. In addition to the bison bone are two bison tooth fragments.

The single bone tool in the collection is a very small (0.31 gm) segment of what appears to be a bone or antler rod.

CHAPTER 8

Late Prehistoric Lodge Sites

The third major group of sites represented in the Reed Collection is composed of those sites attributable to the late prehistoric, early second millennium, occupation of the area. These sites, as is well-known, normally extend across several acres and feature the remains of lodges, pits, and hearths, in addition to holding a substantial quantity of material remains, including pottery; chipped stone, groundstone, bone, and shell artifacts; unmodified animal bone and mussel shell; and, although not represented in surface collections and rarely recovered in excavations, charred plant remains (corn kernels, other seeds, etc.).

Twenty-three late prehistoric sites are considered here. Figure 8.1 shows the distribution of sites in Saline County. Lodges have been excavated on only a few of them, as described in the text, meaning that the presence of lodges on other sites is inferred and not demonstrated. It should, however, be a safe inference in most cases. Before describing these sites and the collections from them, it is necessary to clarify two points about the sites and to introduce some descriptive terminology that will recur throughout the descriptions.

An important matter is to understand what is and is not denoted and connoted by a site designation. Most sites discussed here likely contained multiple lodge remains. The basic settlement configuration at this time, however, was rectangular lodges dispersed along the edges of stream terraces adjacent to rivers. Lodges were neither randomly nor uniformly spaced, but rather tended to occur in small aggregates. As they have come to be defined, individually designated and numbered sites usually encompass one of these aggregates and are composed of a varying number of lodges. Site designations, however, do not correspond to any socially or sociopolitically real unit. That is, in spite of sometimes being referred to as villages, it is more likely that these are accumulations of non-contemporaneous dwellings. At the very least, it is yet to be demonstrated, rather than presumed that these are villages. Moreover, the boundaries of lodge aggregates, i.e., sites, are sometimes quite arbitrary, often simply corresponding to modern property lines. Sites 14SA414, 14SA415, and 14SA416 exemplify this (see site descriptions below).

A second pertinent matter is the nature of the individual dwellings represented on many of these sites. I, and others, use the term lodge to refer to them, but the term earthlodge is often applied—as we will see, Reed often used it in his site forms and notes. The terms lodge and earthlodge are not synonyms, however, as not all lodges are earthlodges. The true Plains earthlodge is a timber-frame, earth-covered dwelling constructed with successive (from the inside) layers of the timber frame, willow matting, grass matting, and earth or sod block covering (Roper and Pauls 2005). Its form, used by various tribes of the Central and Northern Plains, was synthesized in the Missouri River valley of present-day South Dakota in the fifteenth century. Its predecessors on the Central Plains shared certain architectural concepts and were timber-framed, but they were not earth-covered, nor did they contain willow and grass matting above the frame. Instead, they were wattle-and-daub structures (Figure 8.2) that were more variable in form and perhaps also mode of construction than is commonly acknowledged.

My descriptions of the pottery are informed by my on-going studies of various aspects of Central Plains pottery, including vessel form, vessel fabric as revealed in thin-section, and style/decoration analysis. Data from the Reed Collection have been recorded following the same conventions used in a broader study of Central Plains pottery and, as indicated in Chapter 5, are incorporated into that database. Terms follow those defined for that study. Terminology for characteristics of the ceramic fabric tend to follow the usage in ceramic petrography, particularly as systematized by Quinn (2013).

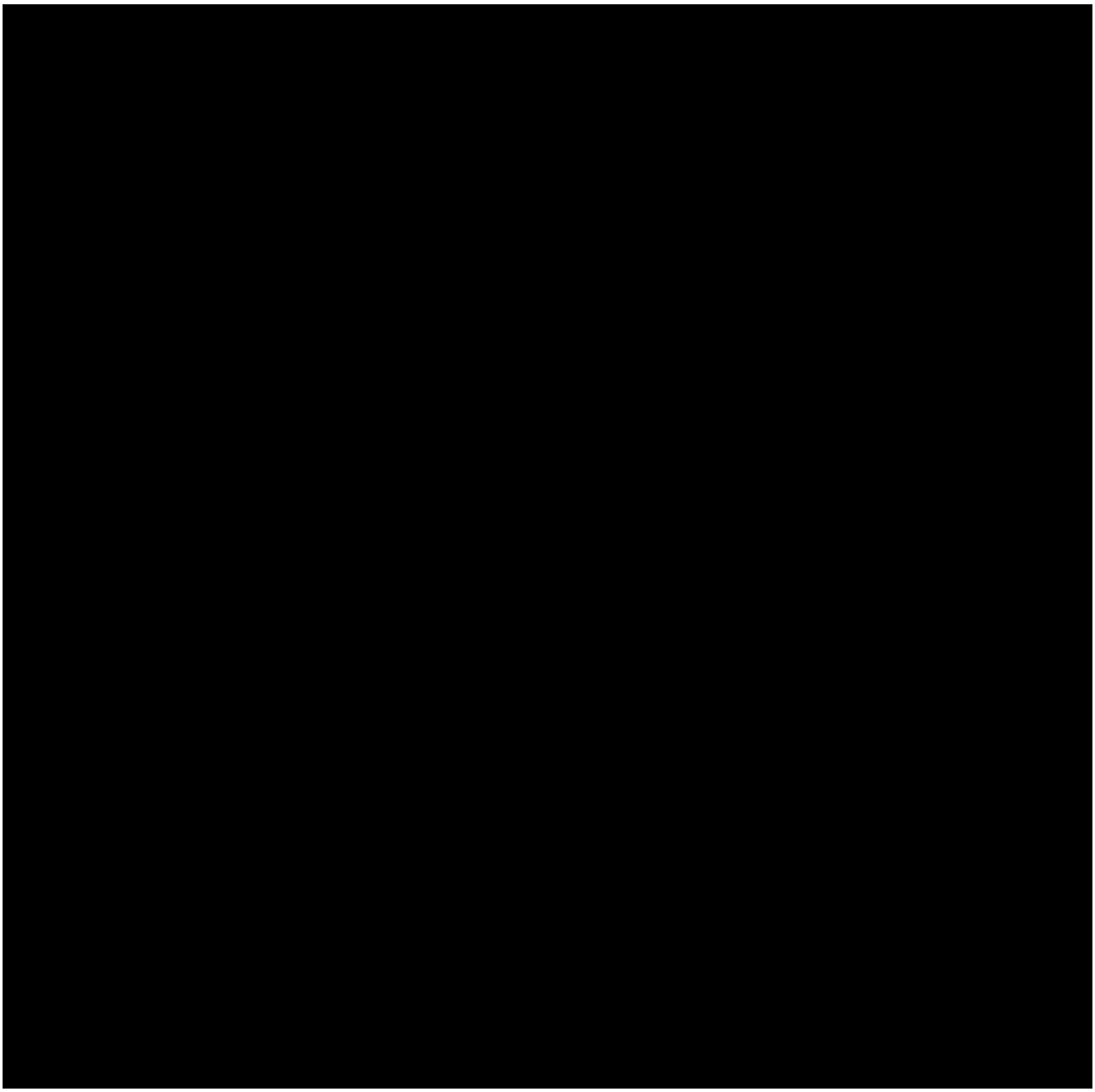


Figure 8.1. Distribution of Late Prehistoric Lodge Sites in Saline County

Projectile point classes (not types, but descriptive classes) are designated following a classification developed by William Duncan Strong (1935:88). Strong's classification chart is reproduced as Figure 8.3. The classes that are particularly pertinent in this chapter are outlined.

Finally, the collections described in this chapter are large. For this reason alone, it is totally impractical to illustrate all or most objects they contain. Additionally, however, the individual site collections show certain uniformities among themselves and become redundant in many ways. Photographed objects are chosen to illustrate the basic forms represented in the collections, as well as the major variations on those basic forms. An effort is made to illustrate each of the characteristic artifact classes somewhere in this chapter. Certain unusual or unique objects, or objects exhibiting highlighted characteristics also are illustrated.



Figure 8.2. Model of Wattle-and-Daub House Construction

14SA414—Kohr Site

The Kohr site, 14SA414, is one of three sites described in this study that was not recorded by Harold Reed but that was known to him and from which he did collect. In fact, the Kohr site was recorded even before Reed was born. It lies on a property that was owned by the Kohr family from 1878 to 1937. In July 1934, Salina amateur archaeologists Guy and Mabel Whiteford went to do some surface collecting at the Great Bend aspect Paint Creek site in northwestern McPherson County. Here, as recounted elsewhere (Roper 2003), they met Nebraska State Historical Society (NSHS) director A.T. Hill and his then-young field assistant, Waldo Wedel, and the NSHS summer field party. As the Whitefords and the NSHS party began to know each other, the Whitefords began to show Hill and Wedel some of the sites they knew in the general Salina and Ottawa counties area. One of these was a site just upstream from the confluence of the [redacted] which contained multiple house remains. Hill and his field party did not excavate here, but the Whitefords soon did, excavating one lodge, which they called Kohr House 1, in late July 1936, and part of a second lodge, Kohr House 2, about a year later (Roper 2001:92–116; see also Roper 2003 for a chronicle of the Whitefords' activities). Between these two lodge excavations, they, with George Kohr's help, found and excavated the cemetery variously known as the Whiteford site, Indian Burial Pit, or 14SA1 (Roper 2006a). The Whitefords said that at least a dozen lodges lay "in the immediate vicinity" of Kohr House 1 and the cemetery (Whiteford 1941:18). Waldo Wedel (1959:513) also suggested that 12 or 15 or even more lodges were represented. For some decades, the lodges and the cemetery were all considered parts of 14SA1 and were sometimes called the Whiteford site. Wedel (1959:563) designated this as one of the type sites for the Smoky Hill phase.

In 1970, then-State Archaeologist Tom Witty evaluated this site as a candidate for the 1970 KAA spring dig. At that time, he administratively separated the habitation site from the cemetery. The cemetery still is designated 14SA1 and is called the Whiteford site; the aggregate of lodges, since 1970, has been designated 14SA414. When Witty filed the 14SA414 site form in 1970, he estimated the site extended across about 20 acres, with cultural debris scattered across most of the terrace. No obvious house locations were noted at that time, however, nor did probing with an Oakfield tool or test pit excavation over a possible location reveal lodge remains (Witty 1970). Probably on this basis, as well as his own surface inspection, Reed several times told me that he did not place much weight on Wedel's assertion of 12 to 15 house mounds on this site. Wedel, though, was probably relying on brief inspections in the 1930s and 1940 and on the Whitefords' accounts

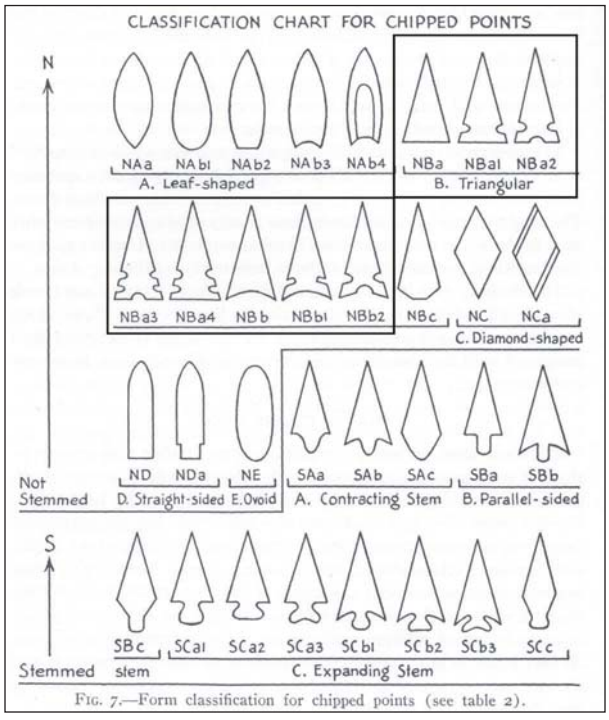


Figure 8.3. Classification Chart for Projectile Points



Figure 8.4. Rim Sherds from 14SA414

from a time when the lodge remains were much more visible and retained greater integrity. Records and collections held at Wichita State University show that Richard Stauffer also had mapped quite a few lodges in this vicinity, although he grouped the lodges into sites differently than do the official state designations for this and several nearby sites. The discrepancies, therefore, may be partially attributed to some differential perceptions of what constituted this site, but it also seems quite likely that by the time Witty inspected the site in 1970, plowing had obliterated the traces of lodges. As we enter the twenty-first century, cultural remains are even less evident on this site.

The Kohr site lies on the front edge of the terrace on the north side of the Smoky Hill River. Its location is only a little more than a mile upstream from the point at which the Saline River flows to the Smoky Hill River. The terrace exposure on which the Kohr site (and the Whiteford site cemetery) lies is the first exposure of this terrace in an upstream direction from the confluence. The elevation here is about 1200 ft amsl.

Reed's collection from 14SA414 is very limited, amounting to only four ceramic rim sherds (Figure 8.4). Where on this large site each of these rims was collected and whether all were from a limited portion of the site or spread over a large part of it are not recorded. One of the four rim sherds has an undecorated direct rim; each of the other three rims is collared. Of the collared rims, one is undecorated, one was decorated by pinching on the collar panel a short distance below the lip, and one exhibits a portion of an incised motif.

Site 14SA421/14SA435

Site 14SA421/14SA435 is one of only two sites in the Smoky Hill River/Saline River confluence area that actually lies on the south side of the Smoky Hill River as it flows in its current position (the other is 14SA422/14SA438, described below). Each site lies on the inside of a broad river meander and is associated with an old meander scar. Reed described the site as lying on a high terrace and that a prominent "old stream scar" meandered through the area. The site, he noted, was associated with the stream scar. Since each site is plotted as lying within the meander scar, it is apparent that the channel position represented by the scar pre-dates the sites. It is not outside the realm of possibility that, at the time of occupation, the river channel was south of these two sites. Without detailed geomorphic/geochronological study, it is not possible to know where the channel was at any given time or the relation between the sites and the stream at the time of occupation. Site 14SA421/14SA435 lies at or just above an elevation of 1190 ft amsl.

Reed recorded 14SA421 on May 1, 1975. Other than describing its relation to the stream scar, he was not able to further describe the site since it had been destroyed by land leveling. It appears from some notes Reed made on January 12, 2000, that the site was exposed during land leveling in 1975 and that he and another person had gone to investigate the report of "some old Indian relics" being turned up during the land leveling operation. Reed thought that a lodge had been destroyed. All he found, though, was the bottom of a pit. His entire collection from this site was derived by salvaging the remains of this pit.

On January 1, 1980, Reed filed a site form for a site given the number 14SA435. While its description is worded differently than is the 14SA421 description, it conveys the same information, adding only that the salvaged portion of the bottom of the pit amounted to about the bottom two inches of the pit. Reflecting his feelings about this on the site form, under Material Observed, Reed wrote "disaster," and under Recommendations for further work, he said

"plot it and forget it." The plot of 14SA435 shows it to be at the same location as 14SA421. In fact, an undated note in Harold's handwriting is stapled to his file folder and reads: "This is the same site as 14SA421; I turned it in twice," a fact he notified the Archeology Office of in February 1983. The site's official state site number now is 14SA435—query of the site online state site file for site 14SA421 produces the advice that the database contains no site record with this number, and the master quadrangle map does not show a 14SA421. The online site form for 14SA435 does, however, list 14SA421 under site name.

Reed's site folder for 14SA435 contains no collections catalog; that for 14SA421 contains a catalog sheet with 14 entries. Of these entries, 8 are for mussel shell, one is for a shell disc, three entries are bone fragments, one is a partial scraper, and one is a river pebble. The actual collection, however, no longer seems to exist, or at least it was not one loaned to me for this analysis.

Site 14SA422/14SA438

Site 14SA422/14SA438 is the second of the two sites on the south side of the Smoky Hill River. Reed's site form for 14SA421 indicates that the scatter from that site "extends across the section line onto another landowner's property" and that he would give that extension another site number. This is what became 14SA422. The distinction between the two sites thus is somewhat arbitrary, even though they are shown on quadrangle maps in the state site files as distinct sites about 250 feet apart. Like 14SA421, 14SA422 is associated with a channel scar and lies at an elevation just above 1190 feet amsl.

The site form for 14SA422 is dated October 8, 1975, and is signed by Harold and Debbie Reed. On that form, the site was described as covering "about 1½ to 2 acres of widely scattered material." The description goes on to suggest that "the main part of the site may have been in the now leveled area to the west [i.e., 14SA421]." Reed's supplemental notes, dated February 1983, suggested that he had not found much at this site but that it would be "worth visiting when the crops are off and after a rain."

On January 5, 1980, Reed completed a site form for what became site 14SA438. It says that he had reported a destroyed site on the same terrace and that the site had been land-levelled and he thought that this might be an extension of that site (a section line, which also is a property line, runs between these sites). The position in which it is plotted is the same as that of 14SA422. Although Reed's notes do not indicate this site was reported twice (as they do for 14SA421/14SA435), the same February 1983 note to the Archeology Office reporting the duplicate 14SA421/14SA435 error also reports the 14SA422/14SA438 error. A query of the online site files for 14SA422 produces the result that the database contains no site record with this number. Nor does the accompanying quadrangle map show a site 14SA422. Further, the online site form for 14SA438 lists 14SA422 with the site name. Officially, therefore, 14SA422 and 14SA438 are the same site.

Reed's file folder for 14SA438 contains no collection catalog and none of the individual site collections bears this number. The file folder for 14SA422, however, contains a collection catalog with nine entries and an individual site collection carries this number. The collection contains ten objects, and presumably the tenth object represents a piece collected in a late trip to the site. It is labeled, but not entered in the catalog. The ten objects include two ceramic body sherds, two biface fragments, three pieces of unmodified lithic debitage, and three pieces of unmodified animal bone.

The smaller of the two sherds is a mineral-tempered sherd with a cord-roughened exterior. It is 6.6 mm thick. The larger sherd is tempered with angular chunks of quartz measuring from around 2.5 to 5.6 mm in maximum measurable dimension. The exterior surface is cord-roughened and appears to have several shallow and rather faint incised or trailed lines at an angle to the direction of the cord-roughening. The interior has what appear to be narrow grooves that presumably are wiping lines. The interior also is uniformly black and has some adhering burned-on food residue. The black may represent sooting during use for cooking. The sherd is 6.9 mm thick.

One biface fragment technically is a medial segment, but may be better described as a pointed end segment missing a few millimeters of its end. One edge on one face is steeply beveled; the other edge on the same face is less markedly beveled. Although it is not alternately beveled, it still probably is from a Harahey knife. It is made of Permian chert.

The other biface fragment is an edge segment of an original of indeterminate form. One face of the remaining edge is steeply beveled, suggesting it *might* have been a Harahey knife. The raw material is Permian chert, possibly Florence A.

The three pieces of debitage are angular flakes. One represents a split pebble, the other two are angular pieces (although not shatter) of Permian chert.

The three pieces of bone include two small fragments of long bone from a medium to large mammal. Both fragments are burned and partially calcined. The third piece of bone is an essentially complete, although heavily weathered, phalange from a large mammal, probably a bison.

Site 14SA415

Site 14SA415 is on the northern (left) side of the Smoky Hill River [redacted] In recent times, the Smoky Hill River made some long and tight meanders (some of them now artificially cut off and channelized) in this area. The site is in the neck of one of these meander loops, lying at an elevation of about 1200 feet amsl in a now-shallow swale that represents an ancient meander scar incised into the terrace deposits.

Reed recorded the site in March 1970, estimating at that time that it covered 2 to 6 acres. The site form filed after the site was located shows that it was not then certain that the site contained a lodge, but Reed also noted that he had permission from the landowner to try to find one. Within a month or so of recording the site, it had become clear that a lodge was present. Harold and Margie Reed, with Earl and Iris Monger, began excavating the lodge in April 1970, working on weekends over the next couple of months. In late June, other KAA members participating in that year's spring dig assisted, and the excavation was completed at that time. The excavation and collection made during the excavation were recently described in detail by Roper and Reed (2003).

Site 14SA415 is one of a series of five excavated lodges along an approximately two-mile-long stretch of the river. The other four include House 1 and House 2 at 14SA414 and two lodges at 14SA403. The 14SA415 lodge is about 7700 linear feet east of 14SA403, 3800 feet west of Kohr House 2, 5500 feet northwest of Kohr House 1, and about 4000 feet west of 14SA1, the Whiteford site cemetery. Other, unexcavated, Smoky Hill phase sites also are found in this general area. Many of these also were recorded by Reed and are described in this study.

The 1970 excavation at 14SA415 exposed the remains of a single lodge. It was a rectangular structure that measured about 38 feet long by 27 feet wide, oriented in a northwest-southeast direction with the entryway to the southeast. The walls were outlined by 26 posts, the lodge had four interior support posts, and the entryway was marked by at least seven posts. A central hearth lay within the square formed by the interior support posts. Two cache pits, one of them cylindrical and one slightly bell-shaped, along with one small basin lay within the lodge.

The artifact assemblage for House 1 was reported by Roper and Reed (2003) and is illustrated in that paper. The assemblage contents are summarized in Table 8.1. The object classes are largely the same as discussed for the lodge sites/presumed lodge sites described in this chapter. The main differences are that, unlike with most surface collections, this excavated collection contains some organic remains and a greater diversity of objects not normally found in surface context.

Site 14SA416

Site 14SA416 also is adjacent to the Smoky Hill River on its north (left) side. It is [redacted] Its location relative to the Whiteford site and other nearby sites is similar to that of 14SA415. In fact, judging from his records, now at WSU, and presumably because of the proximity of the two loci, Richard Stauffer apparently considered what are now officially designated 14SA415 and 14SA416 as part of the same site. The 14SA416 elevation is at or just above 1200 feet amsl.

Reed filed the form for this site on February 4, 1971, describing it as covering about one-half acre. He also described it as "probably the location of a house" and recommended that it be tested. Supplemental notes first suggested that he could not find any dense concentration, a notation that presumes he would interpret a concentration to indicate the location of a house. Later, he added another note saying that on July 9, 1986, he found a

Table 8.1
Collection Contents—14SA415*

Material class	Object class	Count
Ceramic		
	Rim sherd	60
	Body sherd	526
	Loop handle	3
Chipped stone		
	Projectile point	26
	Biface	29
	Chert celt	4
	Endscraper	22
	Retouched flake	18
	Debitage	42
Groundstone		
	Metate	1
	Mano	3
	Abrader	14
	Ax/celt	1
	Hammerstone	6
	Pipe fragment	1
	Hematite	2
	Miscellaneous	1
Rock		
	Unmodified rock	23
Bone		
	Awl	1
	Bead/tube	1
	Red/pin	6
	Worked fragment	4
	Unmodified bone	48
Shell		
	Hoe	1
	Unworked	67
Floral		
	Maize kernel	2
	Wood charcoal	

* Data from Roper and Reed (2003)

concentrated area with pottery, debitage, sandstone, "large bone fragments," and shell "all within about a 50 foot circle." Richard Stauffer also knew this site, but the site form revision filed by his daughter, Brendy Allison, in 2004 adds virtually nothing to the description. In any event, while 14SA415 was excavated, 14SA416 was not tested by Reed, Stauffer, or anyone else.

Reed's collection from 14SA416 contains 127 objects, summarized in Table 8.2. Five rim sherds, plus three body sherds that are from vessel necks, may represent no more than six vessels, although no conjoins can be made. None of these sherds are very large, but basic characteristics of most vessels can be described. Two rims are collared, one of them with a fairly thin but nevertheless noticeable collar. A third rim sherd is very short and represents only a portion of the upper part of the vessel rim. It widens slightly away from the lip and might be from another collared vessel. None of these rims exhibit decoration on the lip or rim panel. The other two rim sherds are direct rims. One is a short rim, the other is a much higher rim but is broken above the neck and is of indeterminate original height. Each is cord-roughened to the lip but exhibits no decoration on lip or rim.

Of the body sherds, 53 are cord-roughened, one is smooth, and the remainder are indeterminate (eroded surfaces). Complete thicknesses range from 4.0 to 11.6 mm, with a median of 6.3, and only one sherd with thickness greater than 9.2.

A total of 15 pieces of daub and burned earth are small and have an aggregate mass of 36.04 gm. Some of the pieces have grass impressions.

The eight projectile points (Figure 8.5) from 14SA416 include five triangular unnotched points (NBa), one triangular single side-notched point

Table 8.2
Collection Contents—14SA416

Material class	Object class	Count
Ceramic		
	Rim sherd	5
	Body sherd	57
	Daub/burned earth	15
Chipped stone		
	Projectile point	8
	Biface	11
	Endscraper	9
	Graver	1
	Retouched flake	16
	Debitage	2
Groundstone		
	Mano	2
Rock		
	Split cobble	1

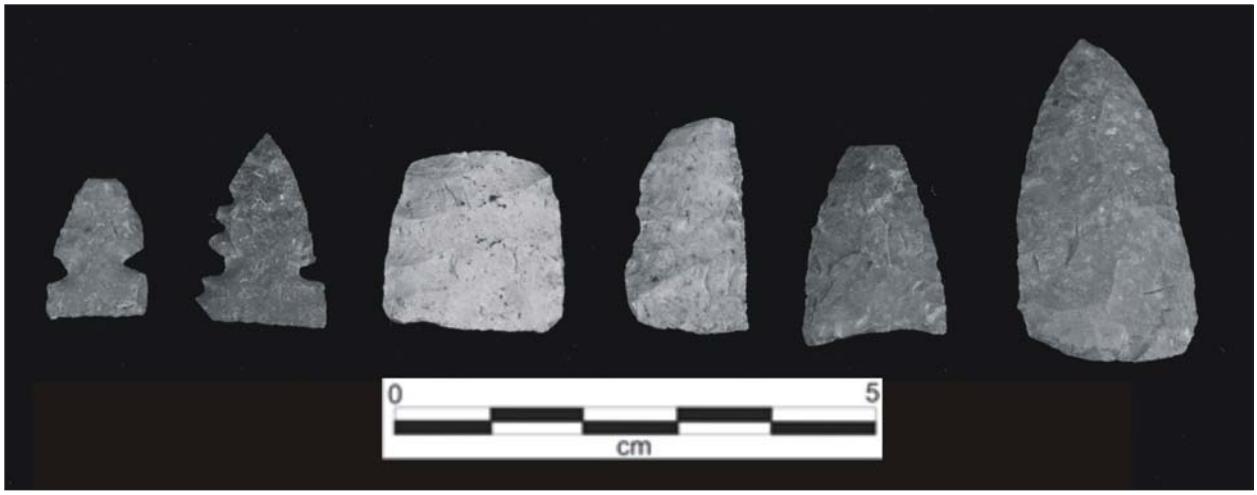


Figure 8.5. Projectile Points from 14SA416

with a straight base (NBa1), one point that also is essentially a single side-notched point with a straight base but that has three additional small notches on one side, and one blade fragment from a specimen of indeterminate form. All points were made on Permian chert, one of them heat-treated Florence A.

Eleven bifaces are mostly fragments of objects of indeterminate original form. Exceptions are one complete thick biface that could be called a small chipped stone celt, and one specimen (Figure 8.6, piece on the right) that is only about half of the original piece but that clearly is an alternately beveled so-called Harahey knife. All bifaces are Permian chert.

The collection of endscrapers (Figure 8.6) is less varied than some of the other collections from lodge sites described in this study. The 14SA416 scrapers were made on blades or blade-like flakes, may be long and narrow with definite keels, and were carefully shaped by flaking across all or most of the dorsal face. All are made of Permian chert, three of them Florence A that feels fine-grained but was not heat-treated.



Figure 8.6. Endscrapers and Bifaces from 14SA416

One object could easily be placed with the retouched flakes, since basically it is that, but the retouched edge has an obviously purposely formed short point, making the piece best called a graver. This is an uncommon object class in late prehistoric assemblages. The flake is Permian chert.

Retouched flakes and debitage are a mixture of shatter, blocky reduction flakes, and reduction flakes, all but one of which are Permian chert. The exception is an unidentified high-quality tan chert retouched flake. Per the definition of the object class, retouched flakes have a continuous row of small retouch flakes on one or more edges. Some could be fragments of other tool forms, especially endscrapers, but these instances are too fragmentary for that to be confidently determined.

The manos are each Dakota Formation sandstone. Each has an overall flat face that exhibits use/wear across its surface.

One split cobble is a near-spherical piece of granite. It shows no signs of deliberate shaping or of use/wear and simply is a miscellaneous rock in the collection.

Site 14SA403—Winslow-Debold Site

Site 14SA403, the Winslow-Debold site, lies about [redacted] Like them, it is on the edge of a terrace on the north side of and immediately adjacent to the Smoky Hill River. It is at the apex of a long and tight meander loop of the Smoky Hill River that has since been cut off by modern channel straightening and the river now is some distance from the site. The site elevation is just above 1210 feet amsl.

Harold Reed filed the original site form for 14SA403 on March 31, 1968, but this is another site that was already known before he became active. As briefly mentioned in Chapter 2, Jim and Richard Stauffer knew this site in the 1950s and excavated there on December 28, 1956 (Stauffer 1957). Richard Stauffer's records indicate that the Stauffer brothers saw the site as a large one, with possibly as many as 11 house mounds visible in the 1950s (Stauffer 1957:6). Reed's site form from over a decade later describes the site as occupying approximately 3 to 5 acres with 2 or 3 lodges. It is not clear if the discrepancy results from differential perceptions of the site by Reed and the Stauffers, or if house mounds visible in the 1950s were considerably diminished by continued cultivation by the late 1960s (as is definitely possible), or some of each. Differential perception is particularly a possibility in light of the fact that the site apparently extends across more than one property.

Reed's 1968 site form recommended excavation of the lodges, and later in that same year, on July 4 to 7, the KAA acted on that recommendation and excavated one lodge. Other than a brief account in the KAA *Newsletter* (Witty 1968), the excavation has not been reported. I have examined the ceramics and recorded systematic data for them as part of a larger study of pottery from central Kansas. I also have obtained radiocarbon dates for the site, although their interpretation remains somewhat problematic (Roper 2013, 2014:41).

Limited additional work has been conducted at 14SA403. The 1968 site form indicates that the landowner of part of the site had "extensively excavated" there and had a large collection. A December 2010 site form revision by Virginia Wulfkuhle indicates that the KAA examined the location in November 2010, finding a light scatter of debris and concluding that the site had largely been plowed away (Wulfkuhle 2010).

The main collection from 14SA403 is that from the 1968 house excavation and is not here described. Reed, however, maintained a surface collection from this site. Its contents are summarized in Table 8.3.

The pottery in the Reed surface collection is limited, but also somewhat revealing. The main message actually is in the body sherds. All body sherds are mineral-tempered, with cord-roughened exteriors and no decoration. Sherd thicknesses range from 4.1 to 12.2 mm with a median of 7.3 mm.

The four rim sherds are varied in appearance. Reed inserted a note dated March 1999 into the collection box saying that one sherd was found discarded after an auction of some materials from one part of the site. It can only be presumed to be from this site. This is a collared rim with no decoration on the lip or shoulder, but an opposed diagonal motif on the collar panel. This main motif is not bounded by zoning lines either above or below, as opposed diagonals on collared rims often are, nor does pinching or punctation appear on the base of the collar.

Table 8.3
Collection Contents—14SA403

Material class	Object class	Count
Ceramic		
	Rim sherd	4
	Body sherd	22
Chipped stone		
	Projectile point	25
	Biface	14
	Drill	1
	Endscraper	11
	Retouched flake	5
	Debitage	3
Groundstone		
	Celt	1
Rock		
	Unmodified rock	3
Shell		
	Disc bead	1

A second rim sherd is a direct rim that is cord-roughened to the lip and lacking decoration on either the lip or the rim. A third rim is overall similar to this one in basic description, but its neck is far less inflected and far less distinct. The final rim probably is a direct rim but it is too short to be definitive. It is not decorated on either the lip or the remaining portion of the rim panel.

The chipped stone portion of the collection is somewhat modest in size. The largest single class of chipped stone objects is projectile points, of which 25 specimens represent a mix of triangular unnotched, side-notched, and fragmentary specimens whose original form cannot be determined (Figure 8.7). Just under half of the specimens, 12 of 25, are triangular unnotched points (NBa) or proximal portions thereof, that vary in size and proportion. Another nine points are side-notched (NBa1) or, in one instance, double side-notched (NBa4). Four of these are broken across the neck but retain enough of the notch to be identifiable. The other four specimens represent distal portions of points snapped across the blade. All but one of the points were made of Permian chert, some of it Florence A. The final point is from a white chert that is not certainly identified but does resemble Mississippian cherts from the Ozark region.

A total of 14 objects were placed in the biface object class. Only one of these specimens actually is complete. It is a roughly ovate and not well-finished piece that may actually represent an unfinished tool. It was made on Permian chert. Another six speci-



Figure 8.7. Projectile Points from 14SA403

mens represent end or medial segments of beveled, so-called Harahey knives. Five of these are Permian chert; the fifth is Smoky Hill jasper. The other seven specimens are miscellaneous fragments of bifaces of often indeterminate original shape. Six of the seven are Permian chert; the seventh is Smoky Hilljasper.

One more bifacially worked tool can probably be characterized as a drill broken across the drill shaft. It is made on a good-quality piece of Permian chert. Drills were not one of the defining traits of the Smoky Hill phase in Wedel's (1959:566) formulation, undoubtedly because of their scarcity. This is not the only late prehistoric site represented in the Reed Collection that has a drill or drills, but they are not ubiquitous across the collections.

The 11 endscrapers are not particularly large nor are the tools well-formed for the most part. All are Permian chert. As discussed in Chapter 3, however, the people of the CKRA did not have direct and immediate access to this raw material and instead had to procure it from some distance to the east, either by direct procurement in the source area or via exchange with people living in the source area. Small tools, worn and/or broken tools, and tools made on what we might see as miscellaneous pieces of raw material are a result. This may be exacerbated by a general tendency to make endscrapers of higher-quality materials, presumably because the finer-grained materials produce a sharper and more durable edge.

Three retouched flakes are simply miscellaneous pieces of Permian chert with retouch on one or more edges.

Debitage includes one piece of angular shatter and two flakes. All are Permian chert.

One groundstone celt (Figure 8.8) was made on a fine-grained granitic rock. It was well-shaped, with a bluntly pointed poll end. The lateral margins diverge smoothly, although they are slightly convex, leaving the bit end not quite as wide as the maximum width. The bit end is somewhat irregular and probably was not as angular as it appears in the photograph. A small unbattered part of the bit suggests it originally was even and sharp.

Three other pieces of rock include one large piece of sandstone and two small fragments of miscellaneous rock. None of these pieces are modified. The sandstone, in particular, though, could be from trimming a large mass of material in the course of manufacturing another object.

A single shell disc bead was made of freshwater mussel shell. It is slightly irregular in plan view, with outside diameter measurements ranging 10.3 to 11.9 mm. It is 3.2 mm thick. The perforation is about 4.2 mm in diameter.



Figure 8.8. Celt from 14SA403

Site 14SA405

Site 14SA405 lies on the west side of the Smoky Hill River, [redacted] and now is within the city. The river is around three-quarters of a mile to the east of the site. Contemporary aerial imagery shows the site and surrounding area completely covered by a residential neighborhood, making it impossible to determine if old channel scars cross the area. Given, however, that the river formerly made a tortuous series of meanders as it turned east a short distance to the north of 14SA405, it is likely that the site area was dissected by old channels that are much closer to the site. In any event, as mapped, the site is between 1226 and 1230 feet amsl.

The site form for 14SA405 is dated January 28, 1969, and is signed by Harold Reed. It describes the site as occupying 2 to 3 acres. No house mounds or debris concentrations that may reflect house locations are mentioned. Materials observed and/or collected include pottery, chipped stone tools and debitage, bone tools, unmodified bone, and shell. The Richard Stauffer collection at Wichita State University also contains material from this site.

The location of 14SA405 now has been swallowed up by Salina's expansion. The site has been completely destroyed without systematic study, leaving the Reed and the Stauffer collections, and any others that may exist, the only remnants of its existence. Reed's collection from this site, however, is no longer in his family's possession and was not available for this study.

Site 14SA402

Site 14SA402 lies [redacted] Like 14SA405, it on the west (left) side of the Smoky Hill River and in a very similar setting. Its elevation is just below 1240 feet amsl. The river currently is close to one-half mile from the site, but aerial photographs, even though not a quadrangle map, clearly show old channel scars just east of the site, suggesting that the river could have been considerably closer at the time of site occupation.

Table 8.4
Collection Contents—14SA402

Material class	Object class	Count
Ceramic		
	Rim sherd	11
	Body sherd	28
	Pipe	1
Chipped stone		
	Projectile point	17
	Biface	17
	Drill	1
	Endscraper	22
	Retouched flake	6
Groundstone		
	Metate	1
	Abrader	2
	Celt	1
	Hammerstone	2
Bone		
	Bone needle	1
	Worked bone	3
Shell		
	Hoe	1
	Disc bead	2

The original site form for 14SA402 is signed by Harold Reed and is dated September 12, 1968. On that form, Reed described the site as occupying 3 to 4 acres. He also noted the presence of "about" four house mounds; supplemental notes from February 1983 suggest four to six mounds. At that time, he noted evidence of minor pothunting, and both there and in supplemental notes he identified other collectors who also knew the site. Chipped stone and shell objects, but, interestingly, not pottery, are listed as observed and/or collected. The collection, however, does contain pottery, likely from later visits to the site. An interesting remark in the supplemental notes is that the site is "outstanding in respect to the quantity of fresh water mussel shells to be found on the surface here."

The collection catalog contains 116 entries, although the physical collection contains 115 objects. The distribution of these objects within the defined object classes is shown in Table 8.4.

Eleven rim sherds (Figure 8.9) in this collection represent probably the same number of vessels.

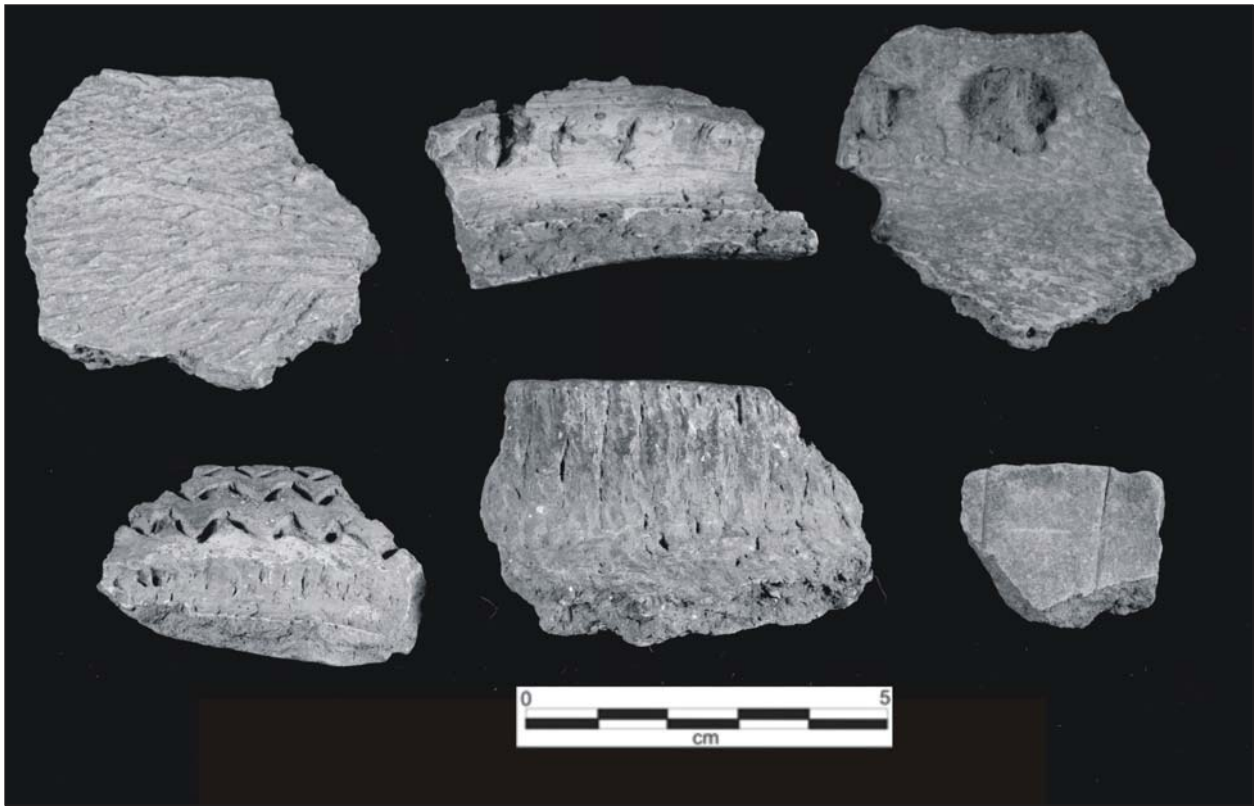


Figure 8.9. Rim Sherds from 14SA402

Three of these are vessels with direct rims. All three are small sherds that do not reliably reflect the sizes and formal details of what almost certainly were the common late prehistoric jars. One of the sherds has punctates on the lip but no decoration on the rim. The other two have no decoration on either the rim or the lip.

Five collared rims exhibit considerable variety in form and decoration. Only one is undecorated. It actually is an S-rim with the external appearance of a collar. This particular collar is convex with an indistinct base. A second rim has a very thin collar with large pinches on the collar panel about 5 mm below the lip. These pinches are so prominent that it is unusually obvious that they are formed by, in effect, gouging the clay with the thumb and forefinger and mounding it between the fingers. The lip is not decorated. A third rim sherd is missing its uppermost part but retains enough of the collar to determine that it is decorated with parallel incised lines encircling the orifice with small pinches on the base of the collar. A fourth rim has a well-executed collar. The lip is not decorated. The collar panel is decorated with three parallel rows of zig-zags, executed not by continuous incising, but rather by individually, and rather deeply, impressing into the clay the end of tool to form each straight segment of the motif. A fifth rim is missing the lip. The remaining portion of the collar panel shows one oblique incised line that presumably is part of a more complex motif, possibly also a zig-zag.

The final three rim sherds are from neckless seed jars, or what are sometimes called coconut pots (Figure 8.9, left end of top row). These vessels are never numerous on sites but they do occur with some regularity and appear in some proportion in the Whiteford site (Roper 2006a:Ch. 8). The differences among the three sherds are slight and do not necessarily preclude them being from the same vessel, but it seems more likely that they represent three separate vessels. These were simple contour, near-spherical or at least ovoid vessels with an orifice narrower than the maximum width; in other words, with an inverted or inward-arcing upper vessel wall. These specific sherds show exterior cord-roughening applied in an oblique to near-horizontal



Figure 8.10. Pipe Bowl, Beads, Needle, and Cut Bison Phalanx from 14SA402

direction. No lip or upper vessel wall decoration is present. This is characteristic, although not quite universal, with these vessels.

The 28 body sherds include 24 cord-roughened and three smoothed-surface exteriors, and one sherd whose exterior is too eroded to observe surface treatment. One of the smoothed-surface sherds has two parallel but widely-spaced (17 mm) narrow incised lines. It is not possible to know what part of the body of this sherd is from or what the full decorative motif was.

One unusual object in this collection is a fragment of a ceramic pipe bowl (Figure 8.10, on left). It is not cataloged but it is labeled as being from this site and is presumed part of the site's assemblage. The ceramic fabric of this pipe appears, from both macroscopic and microscopic (10× and 30×) examination of the break to be a hard compact paste with the customary abundant fine sand natural inclusions but no deliberately added temper. The bowl was cylindrical and just short of 2 cm in maximum interior diameter. The manner in which it is broken leaves the height incomplete, but it was at least the 27.7 mm height of the fragment. The bowl lip is flat and undecorated. The exterior surface exhibits two very regular incised lines, one immediately below the lip, the second about 2 mm below that. These lines encircle the bowl parallel to the lip. Below the lower line are a series of right-to-left incised parallel lines, which are very regularly spaced at ca. 2 mm intervals to completely cover the exterior.

Seventeen projectile points are all small triangular notched or unnotched specimens, all of which are made of Permian chert. Five are triangular unnotched points (NBa). Another two are side-notched with straight bases (NBa1) and one is side-notched with a straight and notched base (NBa2). One more is side-notched with a highly concave,



Figure 8.11. Partial Metate from 14SA402

but not notched, base (NBb1). A final identifiable specimen is corner-notched (SCb1). Seven fragments include one haft element, broken across the neck, that may also be from a corner-notched point, one proximal end that could be from either an unnotched or a side-notched point broken below the notches, and five blade elements or portions thereof. One of these latter may be from a side-notched point.

As they are on most sites considered in this study, the bifaces are a mixed lot of mostly fragments of specimens of varying and usually indeterminate original form. One exception is an end of an alternately beveled piece, and at least two others are from triangular specimens too large to be projectile points. All bifaces are Permian chert.

The collection contains one drill. It is a small T-headed drill or microdrill. The piece is nearly complete, lacking only the distal few millimeters of the shaft. It is of Permian chert.

The 22 endscrapers are characteristic of late prehistoric specimens made, for the most part, on blades or blade-like flakes. All but one of these are Permian chert, eight of them Florence A. The final scraper was made from an unidentified fine-grained chert.

Six retouched flakes vary in size. All are Permian chert, four of them more specifically Florence A.

Not listed in the catalog, but labelled with this site number, is a portion of a sandstone metate with a mass of 2876 gm (Figure 8.11). It is a flat slab of rock that is stable as it sits on a surface (such as the ground), with the opposite face exhibiting a large basin-shaped depression. The basin surface shows use/wear produced by grinding, presumably corn and other foodstuffs.

Two abraders are each fragments of tools made of Dakota Formation sandstone. One is an end from an apparent classic boat-shaped, single-grooved original. The other also is a partial tool. It is rectangular in cross-section with V-shaped grooves running along each fact. This is not a shaft abrader, but more likely served for rasping the edges of chipped stone tools.

The groundstone celt is a fairly small complete object on a fine granitic rock. It is 98.4 mm long,



Figure 8.12. Shell Hoe from 14SA402

44.2 mm wide, and 26.6 mm thick, with a mass of 153.51 gm. Its poll end is narrow and 14 mm wide. From it, the lateral margins diverge to the maximum width just behind the bit, and then diverge slightly to the 40.5 mm wide bit.

Two smooth cobbles exhibit battering on an end and probably served as hammerstones.

The bone needle is a broken, but identifiable, specimen (Figure 8.10). The specimen has an eye, which identifies it as a needle rather than an awl. In this particular case, the piece is broken across the eye. The bone was cut from an unidentifiable fragment of a larger original and was shaped by tapering to a point. The entire surface is highly polished, probably from use.

One bison phalange has been modified by ringing and snapping an end of a bone segment, and hollowing out the interior (Figure 8.10). It is possible that the intention was to also remove the other end to produce a bone tube. It also is possible that this piece is complete, and perhaps was used as a gaming piece.

Two other pieces of bone appear to be longitudinally split bones that are highly polished. They may be sections of broken awls.

One of the outstanding single objects in the 14SA402 collection is a hoe made on a freshwater mussel shell (Figure 8.12). That in itself is not remarkable. The hoe made on a large mammal scapula, often a bison scapula, is considered characteristic of agricultural peoples of the Plains and, in broad perspective, is the most common hoe form on the Plains. In fact, however, the shell hoe is far more common than the scapula hoe in the Salina area (Roper 2001). It has been observed elsewhere on the Central Plains (e.g., Wedel 1943:Plate 28) although nowhere else is it as common as in the Salina area. Examination of specimens in a number of collections from the Salina area shows that they characteristically are made on large shells of species whose shells also are thick and ridged. The ridges would augment the rigidity of the piece by bracing it against torsion around the haft, in a similar manner that the keels so common on chipped stone endscrapers mitigate against torsion around the haft when the tool is in use.

The technology of manufacturing shell hoes is a variation on that used for preparing a scapula hoe. In this case, the distal margin of the shell away from the hinge was cut perpendicular to the long axis of the shell, producing a working end. A hole was cut in about the middle of the piece and was used for hafting this hoe blade to a handle. The 14SA402 specimen is a particularly outstanding example of one of these hoes, and is the shell hoe illustrated with other bone, shell, and groundstone tools from Central Plains tradition sites in the recent *Kansas Archaeology* volume (Roper 2006d:117).

The two shell disc beads are similar to those described for other sites in this study area (Figure 8.10). They measure 9.3 and 9.4 mm in diameter, 2.7 and 2.9 mm thick, and have drilled perforations 3.0 and 2.9 mm in diameter.

Site 14SA407

Site 14SA407 is [redacted] It is the southernmost of the identified probable lodge sites that lie on the west side of the Smoky Hill River. As plotted on maps, it seems to lie on the middle of the terrace with the current river channel over a mile away. The quadrangle map reflects, and aerial photographs make clear, that the terrace holds several prominent channel scars reflecting former river channels. The chronology of channel changes is not known, but it seems a fair bet that the river was in one of the nearby channels in the late 1100s/early 1200s. The site is on the west bank of the westernmost of these former channels.

Reed's site form for 14SA407 is dated September 12, 1968. It describes the site as "scattered over

Table 8.5
Collection Contents—14SA407

Material class	Object class	Count
Ceramic		
	Rim sherd	4
	Body sherd	12
Chipped stone		
	Projectile point	47
	Biface	49
	Drill	1
	Endscraper	38
	Retouched flake	20
Shell		
	Disc bead	1
	Worked	1
Rock		
	Rock	4

several acres." It mentions no debris concentrations or other indications of a lodge, but Reed's recommendation and his notes of February 1983 reflect his suspicion that one was present. Reed had noted that this site is away from the current river channel, so "no one looks here." Perhaps that is part of the reason the collection from this site is rather large, as summarized in Table 8.5.

Pottery is limited in quantity in this collection. Four rim sherds are each from a separate vessel. One is a direct rim that is fairly high (28.5 mm) with a smooth exterior surface and no decoration on either the rim or the lip. One collared rim also is a high rim (33.7 mm). The rim panel is cord-roughened but without decoration, nor is the lip decorated. A single rim sherd is from a neckless, inverted-rim vessel, or seed bowl. Its surface is smooth. The lip is undecorated, but the uppermost part of the vessel wall, just below the lip, exhibits two narrow incised lines, parallel to one another and to the orifice. The final rim sherd is a small piece. It thickens slightly away from the lip and may be from a collared rim. The lip and rim are undecorated.

The 12 body sherds are each cord-roughened on the exterior surface. Thicknesses range from 4.9 to 9.1 mm with a median of 6.3 mm. One sherd has two parallel incised lines. Decoration on the body of a jar is very unusual, but this sherd is fragmentary with some interior spalling, making it not possible to rule out it being from a vessel rim, even a collared rim.

The 47 projectile points are a mixture of triangular notched (NBa, n=13), side-notched with a straight base (NBa1, n=10), side-notched with a straight and notched base (NBa2, n=8), double side-notched with a straight and notched base (NBa3, n=1), double side-notched with a straight unnotched base (NBa4, n=1), side-notched with a convex notched base (NBb2, n=1), and unidentifiable fragments (n=13). Some fragments are from notched points, but the notching and basal configuration cannot be determined from the remaining portions of the point. One triangular unnotched point was made of a white chert that may be Tahlequah; all except one other point are Permian chert, some of it Florence A. The final specimen, an NBa2 point, is Smoky Hill jasper and, interestingly, is highly resharpened to a mere nub of a blade (I have seen this at Medicine Creek, at one site in particular, and it is most prevalent there on points from extralocal raw material).

The bifaces at this site are an unusual, for these collections, mixture of thin, well-crafted specimens and fragments of tools of forms that often are not identifiable, but also are not well-crafted (Figure 8.13). One complete biface at first glance seems to resemble a Paleoindian lanceolate point (Figure 8.13, on left end). Closer examination, however, suggests that likely is not a correct identification—the flaking technology is not characteristic of Paleoindian points and, conversely, it matches that of other bifaces from this site. Lateral and basal grinding on the haft is lacking, and the haft actually may not be quite right for a Paleoindian point. I have little doubt about a late prehistoric authorship for this piece.

Two other pieces are similar, but incomplete. One of them has some alternate beveling on the pointed distal portion, It is not as extensive as on a classic Harahey knife, but it is technologically in that tradition. Yet another piece, also a distal end only, is similar to the lanceolate bifaces but is wider. This piece is 39.5 mm wide and 6.7 mm thick, giving it a width:thickness ratio of 5.9:1. This is very similar to the width:thickness ratios of the large sociotechnic bifaces in the Whiteford site, and thinner relative to width than are Harahey knives, which run about 4:1 or less (Roper 2006a:202–205). No other 14SA407 bifaces approach this, about 4:1 being the highest



Figure 8.13. Bifaces from 14SA407

width:thickness ratio of the other pieces. This piece is 78.0 mm long and probably less than half of the original specimen (the margins appear to still be diverging at the fracture), suggesting an original length at least 156 mm, placing it within, but probably toward the lower end of, the range of sizes of the Whiteford site bifaces (Roper 2006a:202).

Like those from many of the other sites considered in this study, the remaining bifaces are small, often irregular, objects, many of them portions of originals of unidentifiable original form. All are of Permian chert, some of it Florence A. Some of the latter are heat-treated, but some are not. Raw material for those not heat-treated is of a rather high quality and is all very similar, as if it could be from the same original block of raw material.

One drill is a small object of good-quality Permian chert. Several other objects listed as bifaces, since they are that, could be broken drill shafts, but are too fragmentary to reliably evaluate.

The endscrapers are a mix of well-made tools on blades or blade-like flakes and those on other suitable flakes (Figure 8.14). One scraper was made on a flake of Smoky Hill jasper; one other, also on a flake, is either Alibates agatized dolomite or, more likely, Day Creek chert. This latter material occurs in southwest Kansas, but is not common in these collections or others from central Kansas.

Two shell objects include one disc bead and one other worked object. The bead was well-made. It measures 13.0 mm in diameter, making it a bit larger than other shell beads in the Reed Collection. It is 3.1 mm thick, and its perforation is 3.5 mm in diameter. The other piece is definitely a deliberately and rather carefully-shaped object that is complete but assigning any function or name is difficult. It is more or less bell-shaped, 39.5 mm long, 34.4 mm wide at the wider end, and 13.6 mm wide at the narrower end. Its lateral margins are asymmetrically slightly concave. It seems readily described as a pendent except it has no perforation or other accommodation, such as a constriction, to facilitate suspension.

The collection contains three cobbles. It is possible that they served as hammerstones, although battering is not evident. The fourth piece is a



Figure 8.14. Endscrapers and Shell Bead from 14SA407

pebble-sized small sandstone sphere with a small protrusion. A slight indentation at the base of this protrusion, as it joins the sphere, suggests it could have been suspended, although it is not possible to know if that is deliberate or accidental.

Site 14SA420—Forsberg Site

Site 14SA420, the Forsberg site, lies in the north-south segment of the Smoky Hill River valley, [redacted] Like most other sites along this stretch of the river, 14SA420 is on the east (right) side of the valley. Its elevation is about 1260 feet amsl on a terrace remnant that is well-surrounded by old river channel scars, leaving it uncertain whether the river was to the east or the west of the site at the time of occupation.

Margie Reed filed the original site form for the Forsberg site on July 22, 1973. The site was described on that form as occupying about 3 to 4 acres with one probable house mound. Materials collected and/or observed included pottery, chipped stone and groundstone tools, debitage, bone, and shell. No supplemental notes are available.

KWU excavated three lodges at the Forsberg site, one each in the summers of 1973, 1974, and 1975. A report by a KWU student is on file at KSHS, and the Reed Collection records also contain a copy. A recent report by Mark Latham (2006b) is more detailed.

The collections from the KWU excavations now are held at the KSHS. Inasmuch as they have been described and are not part of the Reeds' investigations per se, no account of that material is given here. I have, however, reanalyzed the pottery using the analysis protocol I developed for all Central Plains tradition collections and will use those data in the pottery analysis in Chapter 10.

Site 14SA410

Somewhat over one mile below 14SA420 is 14SA410. Like 14SA420 and, as will be seen, a series of other sites along the north-south segment of the

Smoky Hill River, 14SA410 lies on the east (right) side of the valley. While it appears from general maps to lie a short distance back from the river, plotting it on a 7.5′ quadrangle map or an aerial photograph shows it immediately adjacent to an old river channel scar. Like many other sites, it is associated with the major terrace in the river valley. Its elevation is 1270 to 1280 feet amsl.

Reed's site form for 14SA410 is dated January 28, 1969. It describes the site as scattered over 3 or 4 acres. While it notes no house mounds or depressions, it also says that "2 or 3 areas have more material on the surface than does the rest of the site." The supplemental notes do not add to this assessment. Observed and/or collected materials included pottery, chipped stone and groundstone tools, and shell. Reed subsequently filed a revised site form on January 28, 2000, attaching portion of a USGS 7.5′ quadrangle map. The form, however, simply says that the revision was intended to tighten the site location and that nothing had changed since the original site form was filed in 1969.

The collection from this site is modest, containing 78 catalog entries and 79 objects (one projectile point is uncataloged). A summary of objects, by class, is shown on Table 8.6.

Table 8.6
Collection Contents—14SA410

Material class	Object class	Count
Ceramic		
	Rim sherd	5
	Body sherd	10
Chipped stone		
	Projectile point	16
	Biface	10
	Drill	2
	Endscraper	17
	Retouched flake	9
	Core	1
	Debitage	3
Groundstone		
	Abrader	1
	Mano	2
	Axe/adz?	1
	Hammerstone	1
Rock		
	Unmodified rock	1

The five rim sherds are each from a separate vessel. The collared or direct rim dichotomy is difficult to apply here, and distinctions are made as much on the basis of technological and forming characteristics as gross appearances. One rim can be called collared with little difficulty, even though it is missing the lip and upper part of the rim panel. The remaining portion of the rim panel is cord-roughened and undecorated, but that does not ensure that the upper part of the rim was undecorated. A second rim that can be called collared retains the lip and entire rim panel. The collar is thin and both lip and collar panel lack decoration. A third rim appears from the exterior to be a direct rim with appliqued pinches or nodes about 10 mm below the lip. However, the profile and visible details of the ceramic fabric indicate that the pinches are at the base of the uppermost clay strap that forms the vessel. This is how collars were produced, and it appears that this is a thin collar with prominent nodes on its indistinct base. The thin lip is undecorated. Another rim sherd also appears direct, but its profile suggests a wedge lip. Short right-left oblique punctates appear on this wedge, alternatively stated as the front edge of the lip and so as to protrude the plane of the lip over the uppermost part of the exterior surface. The final rim also has a wedge appearance, with deep punctates on the wedge or front edge of the protruded lip. In this sense, it is the same as the fourth described rim, except that the punctates are vertical and much bolder. Beneath them are three and the upper edge of a fourth parallel incised line encircling the rim parallel to the orifice.

The ten body sherds are each mineral-tempered, cord-roughened sherds. Eight complete thicknesses range 5.1 to 9.0 mm with a median of 5.7 mm. All body sherds are undecorated.

Sixteen projectile points include two specimens that likely were not contemporaneous with, but are older than, the main occupation at 14SA410 and 14 that were contemporaneous with it. Of the two older points, one is similar to the point from 14SA447, described in Chapter 6, that resembles specimens Blackmar and Hofman (2006:50) refer to as Late Holocene Stemmed. It is made of a jasper-colored quartzite, possibly of the Spanish Diggings source type. The other is a portion of a corner-notched dart point that retains enough diagnostic



Figure 8.15. Chipped Stone Objects from 14SA410

characteristics to suggest it is a Snyders point. It was manufactured of Permian chert.

Fourteen projectile points contemporary with the occupation include seven unnotched triangular specimens (NBa), one side-notched triangular point with a straight base (NBa1), three side-notched with notched base points (NBa2), and one double side-notched with notched base point (NBa3), in addition to two that have much or all of the haft element missing. One of these latter appears to be a side-notched point, either a NBa1 or NBa2, and one is a blade fragment with no part of the haft remaining. All these points are of Permian chert.

Two drills are medial segments of broken shafts. Each is Permian chert.

Characteristic of the sites represented by these collections, the bifaces are fragments of original specimens of varying size and shape (Figure 8.15). They never appear to represent particularly large pieces, perhaps an indicator of the difficulty of acquiring chert in this area. One specimen is Smoky Hill jasper; all others are Permian chert.

As with some of the object descriptions to this point, the 14SA410 endscrapers are a mixture of sizes and forms (Figure 8.15). Few are carefully shaped, probably reflecting exigencies of available raw material. Also reflecting a scarcity of raw material and careful use of what was available, one complete specimen has a working end at each end of the tool. This might seem an obvious solution to raw material scarcity. Scrapers, however, often are made on blades or blade-like flakes, leaving one end of the flake with a striking platform and bulb of percussion that are difficult to impossible to thin

and shape to a working edge. Periodic resharpening of the one working end, producing continual shortening of the specimen, is more common and may achieve the same goal. All endscrapers are Permian chert, some of them, including the double-ended specimen, specifically Florence A chert.

Retouched flakes and the few pieces of debitage are all but one of Permian chert; the exception is quartzite. Retouched flakes are a mixture of size and shape. A few may be fragments of endscrapers, but with the endscrapers as mixed as they are, that is difficult to reliably determine.

The core fragment also is Permian chert. It represents an angular edge of a block of material from which flakes were removed. The angular edge itself can best be characterized as shatter, possibly dislodged from the original block during other flake removals—Permian chert is abundant in its source area but it has one drawback in that it has many fracture planes, leaving pieces vulnerable to end shock as they are worked.

Five groundstone objects and one piece of unmodified rock are present in the 14SA410 collection. The one abrader in the collection is an end segment of a single-grooved, probably boat-shaped, shaft abrader. It is made of Dakota Formation sandstone. This same material was used in the manufacture of two manos. One of these, with a mass of 1570 gm, is rather large for a mano, particularly if we consider the size of a person in this area at that time. The height range of women in the Whiteford site cemetery ranged 4′ 11″ to 5′ 4½′ with a median of 5′ 0½″ (Roper 2006a:224); hand sizes presumably were commensurate with this. Nevertheless, the piece is overall flat on one face and, revealingly, use/wear is readily observable to the naked eye. The other mano is smaller (589 gm) and very comfortably fits the hand. It too has readily observable use/wear on one face. A fourth sandstone object is axe- or adz-shaped, but the question is whether it really is a tool. It has no convincing signs of deliberate shaping. One can hardly see how it could have been a functional object, and it shows no signs of use or wear. The final groundstone object is a chert cobble with signs of battering, possibly indicating use as a hammerstone. The unmodified rock is a fragment of a pebble or cobble.

Site 14SA406

Site 14SA406 is [redacted] It lies at a point in the valley where the river is at the extreme east edge of its valley. The site elevation is 1280 to 1300 feet amsl and is on the front edge of a low upland. This places it 10–30 feet above the terrace.

The site form for 14SA406 was completed by Harold Reed and is dated March 26, 1968. It describes the site as extending across about three acres, although supplemental notes of February 1983 indicate that "artifacts can be found along the ridge for ¼ to ½ mile." The map on file with the site form reflects this, as does the site map in the Archeology Office at the KSHS. The 1968 site form reports "2 or 3 lodges," and the 1983 supplemental notes indicate that a large mound, presumably a house mound (based on context) was still visible the last time Reed had been there in about 1975. The site form and notes also indicate that he was not the only person who knew about the site, indicating that it was "well-known to local collectors and has contributed to several collections," that of the landowner among them, and recording that "someone" had done some digging near the large mound in summer 1966. Other than the landowner, the other collectors are not identified.

The 14SA406 collection includes 245 cataloged objects and an additional eight projectile points that are not cataloged. The collection is summarized in Table 8.7.

Thirteen rim sherds from 14SA406 represent that same number of vessels (Figure 8.16). Of these, nine are collared rims, three are direct rims, and one is from a vessel with no rim rising above a distinct neck. Without meaning to be judgmental, the manufacture of these vessels can nevertheless be described as casual, although not entirely careless. Most rim collars are rather weak and thin, to the extent that one rim scored here as collared and one scored as direct do not appear to be very different, and the distinction is made because the first of these two does have, in profile, an appearance of a distinct, if slight, point of inflection representing a collar base, whereas the other does not. None of the direct rims and only two of the collared rims are

Table 8.7
Collection Contents—14SA406

Material class	Object class	Count
Ceramic		
	Rim sherd	13
	Body sherd	71
	Daub	4
Chipped stone		
	Projectile point	99
	Biface	20
	Endscraper	18
	Retouched flake	16
	Debitage	5
Groundstone		
	Abrader	5
	Hammerstone	1
Rock		
	Unmodified rock	1

decorated. One of the few rims with a prominent collar has somewhat carelessly executed lines encircling it. This motif technically is parallel incised lines but on this particular vessel, the thin, narrow lines frequently stray from and return to their parallel courses. One other rim with a small and weak collar was, after some deliberation, scored as having two rather poorly executed oblique incised lines. The overall dearth of decoration, however, is characteristic of many sites in this area.

The rim with no neck is an example of a nearly spherical seed bowl that often is around 15 cm in maximum diameter, with a variably-sized orifice (this is based on analysis of measurements on vessels in numerous collections from around the Central Plains). Several of these occur in the Whiteford site and sherds are found regularly, if in small numbers, on habitation sites throughout much of the Central Plains. They occasionally are decorated but more

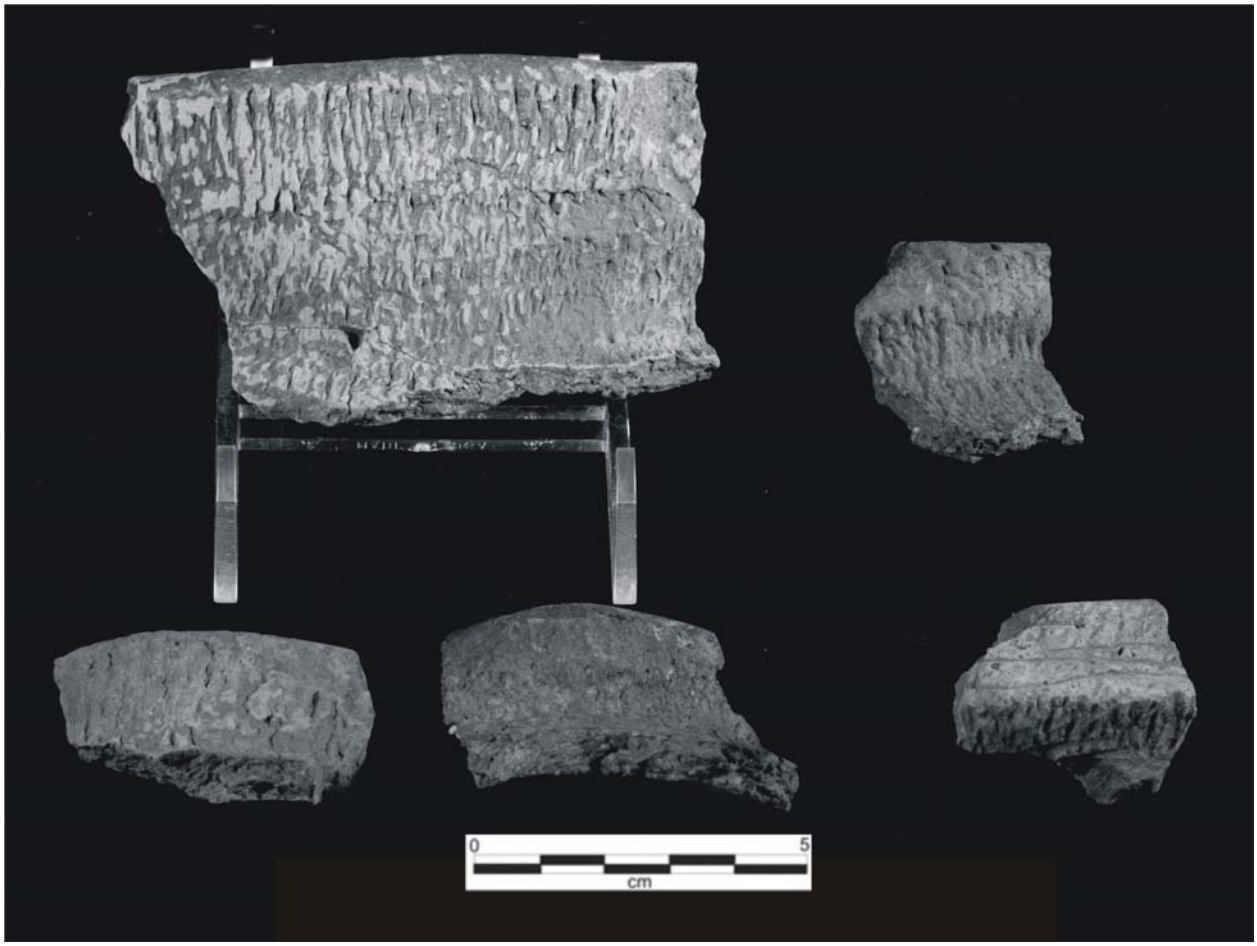


Figure 8.16. Rim Sherds from 14SA406

often are not. The 14SA406 specimen is not decorated.

A total of 69 of the 71 body sherds range from 3.6 to 10.8 mm thick, with a median of 7.0 mm. These sherds are predominantly, 61 of 70 or 87.1% (the surface of one sherd is eroded and indeterminate), cord-roughed or smoothed-over-cord-roughened. One of the thickest of the sherds exhibits overfiring and bloating (see [Rye 1981:109] on this phenomenon) and is overthickened from the bloating. This is not a unique occurrence in the area. Of around 2500 body sherds from central Kansas and southwest Nebraska for which I had recorded individual body sherd data at the time of writing this specific site description, I had observed similar bloating in just over 2% of cases involving six sites. Two of these are in the general Salina area, although they are not part of the Reed collections.

Four small pieces of daub are present in the collection. Except for one piece that is small and possibly worn, but nevertheless is correctly identified as daub, all pieces retain impressions of grass leaves and stems.

Table 8.8
Projectile Point Classes—14SA406

Class	Count
Archaic	1
Nba	29
NBa1	33
NBa2	8
NBa3	7
NBa4	3
SCb1	1
Fragments	17

Projectile points are the most numerous objects in the 14SA406 collection (Figure 8.17). The entire aggregate of points exhibits considerable morphological size variations, as indicated in the counts of individual classes (Table 8.8).

One point is a side-notched specimen with a concave base. Its size and overall appearance identify it as a Paleoarchaic, specifically Early Archaic, point of a form associated with the Logan Creek



Figure 8.17. Projectile Points from 14SA406

complex. Its blade is reworked as a drill, the shaft of which is broken. It is impossible to know if it was repurposed during the Early Archaic period or by a later Ceramic-age flintknapper. Given the time difference between the Early Archaic period and the approximate time of occupation of 14SA406 (6000 or more years) and the likelihood of a considerable amount of accumulation of sediment on the terrace during this time, it is unlikely that this point represents an early occupation on this location and more likely is a piece collected by late prehistoric people. In a sense, it is surprising that more such older points do not appear in these collections, for it is rather common to find Paleoindian or Archaic points in late prehistoric sites to the north and west. On the other hand, since areal surveys, such as Reed's, do not record many Paleoarchaic sites in the CKRA and surrounding area of central Kansas, it is possible that late prehistoric people had few such sites from which to collect.

The other 98 points from this site are triangular arrowpoints with or without notches, and, when notched, exhibit one of several notching configurations. Triangular unnotched points (NBa) and points that are side-notched with a straight base (NBa1) are predominant, as they are in many collections described in this study. The other configurations, side-notched with a concave base (NBa2), double side-notched with (NBa3) or without (NBa4) a basal notch, are notably less common. One small corner-notched point (SCb1) is present. One point (NBa1) was made of Smoky Hill jasper, all other points were made of Permian chert. The large diversity of point forms observed on this site may seem unusual, and in a sense *is* unusual, but so also is the sheer number of arrowpoints in the collection. The presence of the uncommon notch configurations may be due to the well-known tendency for an assemblage's size and diversity to be correlated, i.e., rarer forms are less likely to be observed in smaller samples than they are in the larger samples and, conversely, larger samples may well be more diverse than smaller ones. The explanation for the diversity of points on this site could be a simple as that. It actually may be not the diversity but the large number of points from this site that is remarkable, especially since Reed noted that the site was well-known to collectors. Given that the site is known only from surface collections, however, it would be unwise to postulate any functional or other reasons for the plethora of points here.

The bifaces in the 14SA406 collection are largely fragments of objects of largely indeterminate original form or are small, irregularly-shaped pieces. The exceptions are three end fragments exhibiting alternate beveling. All bifaces are Permian chert.

The endscrapers from 14SA406, like those from some of the other sites discussed in this study, also exhibit considerable variety in size and shape. All are Permian chert. Once again, the variety may be due to the unreliability of obtaining cherts, particularly the higher-quality cherts that were preferred for scraper manufacture.

Retouched flakes and debitage in this collection are, as is characteristic of many of these collections, of varying size and configuration. All but one of these flakes are Permian chert.

Five abraders are all fragmentary and appear well-used. None are classic slap-and-slide, U-shaped in cross-section, boat-shaped in plan view abraders. Three of the four specimens have grooves on more than one face.

Archaeologists are sometimes too quick to call any fist-sized rock found on a site a hammerstone. The specimen from 14SA406, however, appears to exhibit some battering on the corners and may have served that function. One other, smaller (45.6 gm) smooth pebble does not exhibit battering and is regarded as merely a piece of rock.

Site 14SA401

Site 14SA401 is [redacted] Like 14SA406, and many other sites that lie along the north-south segment of the Smoky Hill River, 14SA401 occupies a position on the front edge of the terrace, immediately adjacent to the river. Its elevation is between 1280 and 1290 feet amsl.

The original site form was filed by Harold Reed on September 12, 1968. On it, the site is described as occupying approximately two acres in a cultivated field. Reed also noted that that two lodges were visible in the field and that there "probably" were more in a pasture to the south. He reported collecting pottery, projectile points, scrapers, and an abrader, and also observing debitage, small pieces of sandstone, bone, and shell. Supplemental notes dated

Table 8.9
Collection Contents—14SA401

Material class	Object class	Count
Ceramic		
	Rim sherd	10
	Body sherd	52
	Daub	2
Chipped stone		
	Projectile point	13
	Biface	13
	Endscraper	21
	Retouched flake	6
	Debitage	4
Groundstone		
	Abrader	2
	Mano	1
	Pigment	1
Faunal material		
	Unmodified animal bone	5
	Shell	2

February 5, 1983, indicate that some and possibly all of the site had been destroyed by construction of some farm buildings. A site form revision filed on January 28, 2000, contains this same information.

The collection catalog contains 130 entries for 132 objects. The differences are that a single number was assigned to two small pieces of daub, and a piece of pigment was uncataloged. I gave it catalog number 131. Table 8.9 summarizes the contents of this collection.

The ten rim sherds are, for the most part, rather small, making it difficult to reliably describe them (Figure 8.18). It appears, however, that the ten rims include five direct rims, one wedge-lip rim—a designation used to denote a rim that has what could be perceived as a very short collar but that actually is an extension of a beveled lip beyond the plane of the exterior surface. Two of the other four rim sherds are collared, and the final two are S-rims. None of the direct, wedge, or collared rims are decorated either on the lip or on the rim. Each of the S-rims,

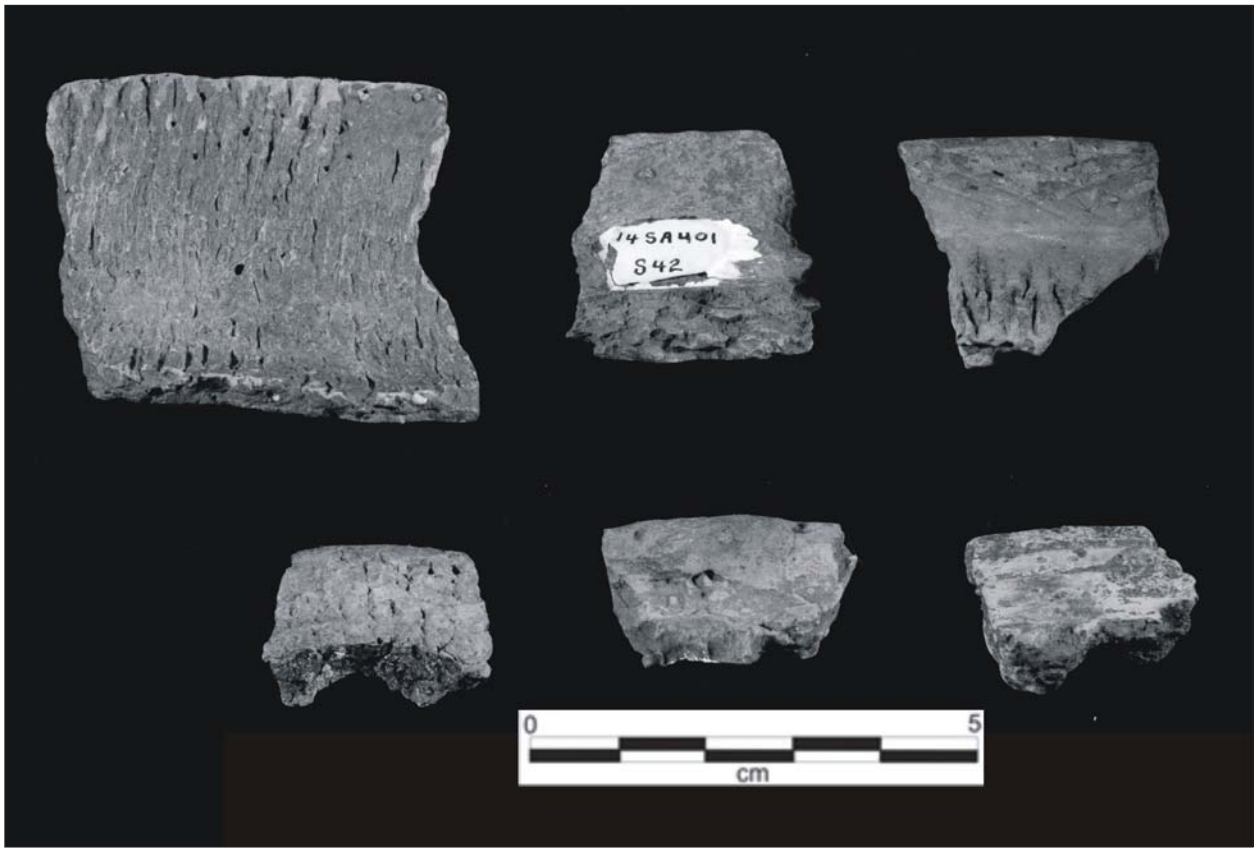


Figure 8.18. Rim Sherds from 14SA401

though, is decorated on the rim panel, but not the lip. One of these two is decorated with four parallel incised lines encircling the rim and paralleling the vessel orifice. It is possible that the base of the collar has punctations, but the sherd is broken such that that cannot be reliably determined. The other S-rim has a marked interior channel that forms the S. The decorative motif on the rim panel is opposed diagonals with zoning lines both above and below the main motif. This is an interesting occurrence in this Smoky Hill River valley location. The zone opposed diagonal on a pronounced S-rim combination occurs with some regularity to the west, particularly in late prehistoric sites along Medicine Creek in southwest Nebraska. There, it occurs on vessels that readily stand out as particularly carefully made and on which the rim seems made to a fairly tight set of specifications. I described this for two Medicine Creek sites in 1996 (Roper 1996:360–363) and have since seen additional instances that usually match these specifications. This 14SA401 rim does too, and is one of few rims of this description that I have seen beyond southwest Nebraska. Without a thin-section or at least a fresh break, it is difficult to characterize the ceramic fabric too closely, but from what I can see, the fabric of this sherd is fully consistent with that of other sherds in this collection and this general area. It does differ from the Medicine Creek fabric, thus implying local manufacture with little chance that it is imported from a source to the west.

Most body sherds also are fairly small, with one half of them in the 25–30 and 30–35 mm size classes. Of the 52 body sherds, 42 are cord-roughened, seven have smoothed-over-cord-roughened surfaces, and only three have smooth exterior surfaces. Thicknesses of all sherds range from 3.7 to 10.8 mm, with a median of 6.5 mm. All sherds are mineral-tempered but seem to represent at least two fabric classes.

Thirteen projectile points include five unnotched triangular points, three side-notched points, and five blade segments from points of unidentifiable original configuration. Of the three side-notched specimens, two have single side-notches (NBa1), and one has double side-notches (NBa3). One single-side-notched point appears to have a second side notch on one margin, but close inspection of the object shows that the extra notch is post-manufacture damage, not a manufactured notch. All but one of these points was made of Permian chert, and five of them were heat-treated. The thirteenth point is Smoky Hill jasper.

Ten of the 13 bifaces are fragments of originals of indeterminate form. Each of the three complete specimens is triangular in plan view, with rounded basal corners and somewhat blunt tips. The most complete of the fragments also is triangular and quite thick, probably with sharper basal corners. All bifaces are made of Permian chert and five of them show evidence of heat-treatment during tool manufacture. Of these five, four are Florence A chert, a material that often is heat-treated during the tool manufacturing process. The other heated biface also is Permian and exhibits crenated fractures, indicating that it was overheated.

The endscrapers are a mixed lot of large and small, very thick and average thickness, and complete and fragmentary specimens. Raw materials include Permian chert for 14 scrapers, Florence A for three others, Smoky Hill jasper for one more, and three of unidentified chert. These latter are all fine-grained, quite high-quality materials. This use of fine-grained cherts for endscrapers has ample precedents in Central Plains tradition assemblages.

All six retouched flakes are simply miscellaneous flakes with some, usually continuous, retouch on one edge. Some may be fragments of originally larger pieces; some almost certainly retain their original form. All are Permian chert.

The small quantity of debitage includes one secondary cortex flake of Florence A chert that was not heat-treated; one small piece of quartzite shatter; one large flake of a very homogeneous, partially translucent chalcedony from an unknown source; and one cortex flake derived from a cobble with a smooth exterior.

Groundstone objects of Dakota sandstone include two partial shaft abraders (Figure 8.19) and one partial mano. One abrader is a medial segment of a specimen with a rectangular cross-section. One face has the customary single U-shaped groove parallel to the long axis of the object. The other abrader is smaller and has a triangular cross-section. The single groove is more nearly parabolic. The mano is a fragment from one end of what appears to have been a well-shaped original. One face exhibits wear resulting from use. Examination at low power (10×) magnification shows extensive wear on individual

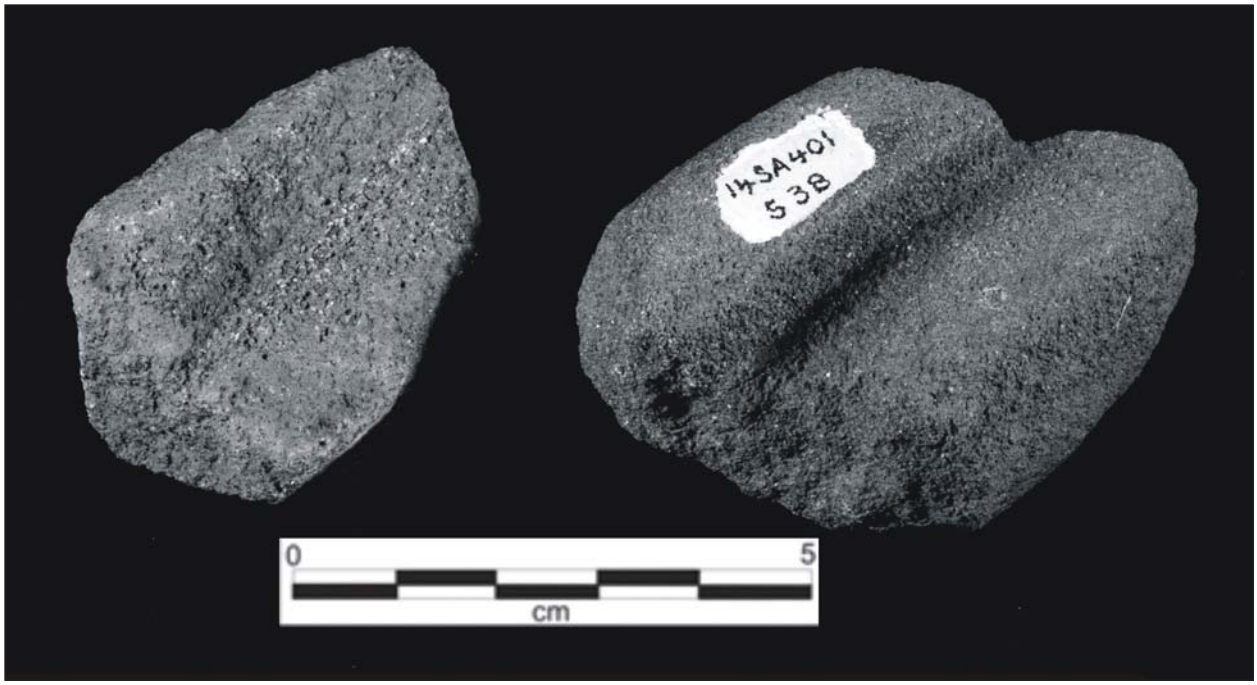


Figure 8.19. Abraders from 14SA401

grains in the sandstone, along with bright polish and striations, both of which result from use.

The collection also contains a small piece of ochre with a mass of 1.86 gm. This material is very friable and readily could serve as pigment. Ochre appears in small pockets in the Dakota sandstone formation and is locally available.

Two small pieces of daub have an aggregate mass of 8.10 gm. Neither is large, but each retains some grass stem and leaf impressions.

Five bones are all unmodified. At least three are from bison and include two tarsals and a phalanx. None exhibit cut marks or burning. A fourth piece of bone is a small fragment from a skull or other thin bone of a mammal. It exhibits no cut marks but it was burned. The last piece is an unidentified, solidly burned dense straight piece that may be a fragment of a tool.

Two shells are partial valves of medium-sized freshwater mussels. Each retains its hinge. Neither is otherwise complete, and one of them may have been deliberately cut.

Site 14SA412

Site 14SA412 lies on the front edge of a terrace at an elevation of 1300 feet amsl, and is on the east side of the Smoky Hill River. A fairly long and narrow meander loop of the river now extends away from the site area, but the quadrangle map and, to an extent, aerial imagery suggest the river channel may once have been immediately or nearly immediately adjacent to the site. Without an alluvial chronology, it is not possible to know if this was the river channel at the time of the site occupation, but it is a reasonable possibility.

Harold Reed filed the original site form for 14SA412 on February 20, 1969. At that time, he described the site as occupying an area of 3 to 5 acres and having two debris concentrations that may indicate lodges. Material observed and/or collected included pottery, chipped stone and groundstone tools, debitage, and shell. Supplemental notes from February 1983 suggest that cultivation had "taken a toll here since I first became aware of the site in the early 1960s."

It is possible that the Whitefords previously knew this site. It is not plotted on their maps, now at the KSHS, but a verbal description of a location they called the Lindeman site matches 14SA412 and is thought to be a reference to it (discussed in Roper 2001:156). The Whitefords excavated a single burial with funerary objects on the Lindeman site. The skeleton was covered back up, but six teeth and some

artifacts were retained in their collection. The teeth have been repatriated; the artifacts are described by Roper (2001:156–160). It is not clear if these are from the burial or from elsewhere on the site.

Finally, Reed's site form and supplemental notes list the names of others who knew the site. There is no indication, however, that any of them, other than possibly the Whitefords, conducted any excavation there.

The Reed Collection from 14SA412 is fairly large, comprising 292 objects, as shown in Table 8.10. The pottery collection contains 11 rim sherds and 27 body sherds (Figure 8.20). This is a small number but nevertheless appears to be a mixed collection of materials from several occupations over an extended interval of time. This is reflected in both rim sherds and body sherds, as well as in ceramic fabric. As I will discuss at some length in Chapter 10, it can be very difficult in the CKRA to differentiate between what usually would be called Woodland and what would be called Smoky Hill phase pottery or Early Ceramic and Late Ceramic, which is part of how I came to see that the situation is more complex than this and is why I do not use either of these sets of terms in this book.

With the benefit of having examined much of the pottery from other sites in the Reed Collection as well as other existing collections from the area, the following accounts for the general appearance of this site's pottery. It was written after going beyond this particular site to complete the description of the pottery from other sites, analyzing data across a number of the sites, and then returning to deal with this site's pottery using the insights from the cross-site analysis.

The majority of body sherds, and probably rim sherds too, are not consistent with the pottery from late prehistoric sites described to this point. The rim sherds are direct rims that do not flare and are cord-roughened to the flat lips. Neither lips nor rims are decorated. Rim and body sherds are thick, ranging from 7.2 to 9.4 mm with a median of 8.5. This is in the vicinity of the thickness of the pottery from the Intermediate group sites described in Chapter 7 (see Chapter 10 for more).

A second group of sherds also are represented by several body sherds and probably two rim sherds. They also are cord-roughened and lack decoration. What distinguishes them from the first group is their fabric. As described in Chapter 10, these sherds are tempered with coarse chunks of either limestone, or bone, or both. Much of this is now leached, leaving visible pits on both surfaces. This distinct and easily recognized fabric dominates collections from 14SA408, described below, and also dominates assemblages from sites along the segment of the Smoky Hill River in northern McPherson County.

Three rim sherds are collared. All collars are thin. One is undecorated and is cord-roughened on the collar panel and lip. A second one also is undecorated. It is partially cord-roughened, and partially smoothed (probably completely smoothed over cord-roughening) on the collar panel. The lip is rounded and smooth, with clay slopped over onto the upper part of the rim. The third rim sherd also is undecorated and has smoothed-over cord-roughening on the collar panel. None of these rims can be described as well-made.

The fabric of the last rim sherd is distinct from all

Table 8.10
Collection Contents—14SA412

Material class	Object class	Count
Ceramic		
	Rim sherd	11
	Body sherd	27
Chipped stone		
	Projectile point	92
	Biface	52
	Drill	3
	Endscraper	50
	Retouched flake	33
	Debitage	5
	Core	1
Groundstone		
	Abrader	3
	Celt	1
	Mano	1
	Nutting stone	1
Bone		
	Awl	1
Shell		
	Hoe	3
Rock		
	Rock	8



Figure 8.20. Rim Sherds from 14SA412

other rims and all but one body sherd in this collection, in that its temper is a dark colored fine quartz sand. This is more common in sites in river valleys to the north of 14SSA412. The lip of the rim sherd is flat and undecorated; the rim has remnants of three parallel incised lines, but is incomplete and could have originally had more.

Two body sherds, one of them from the neck region of a vessel, are thin, with smooth exterior surfaces. The fabric is highly reminiscent of some of the shell-tempered pottery in late prehistoric sites beyond the Smoky Hill River valley (from which I have never seen a shell-tempered sherd) except that it has no shell nor does it exhibit the elongated voids resulting from leaching of shell temper. The sherd from the neck is quite small but one part of it shows the ends of two trailed lines that would have run parallel to the vessel height. Importantly, they are on the portion of the sherd from the upper part of the shoulder. Shoulder decoration in this part of Kansas is not common but, when present, is usually associated with shell-tempered vessels. An exception is three sherds from the Markley site, in the Minneapolis locality (Roper 2001:124–136). These two 14SA412 sherds may be a second exception.

The projectile points are a very mixed lot that covers a wide temporal range. Almost certainly the oldest point in this collection is the haft element of a point that might be lanceolate but more likely is square-stemmed. It has very slightly convex lateral margins and a concave base (that is more concave than it appears because one haft corner is slightly damaged). Both lateral margins and the base are ground. Without more of the specimen it is impossible to make a definitive statement of cultural or temporal affiliation, but the haft form and the presence of the grinding suggest it is no younger than Early or, at most, Middle Archaic.

Another six points are medium-to-small points or haft fragments thereof (Figure 8.21). Blades take the shape of an isoceles triangle, with shoulders varying from slightly oblique to barbed. Haft elements have straight lateral margins that converge somewhat and then form a continuous curve with straight to convex bases. Raw materials of these points are unidentified.

Eight points are medium-sized corner-notched specimens that take a variety of forms and, in traditional typologies, would never be assigned to a single named type (Figures 8.21, 8.24). In a traditional



Figure 8.21. Older Projectile Points from 14SA412

chronological scheme, however, all would best be considered Late Archaic or Woodland, although not Late Woodland. Raw materials include Permian chert and Smoky Hill jasper, but also Hartville Uplift chert and Spanish Diggings quartzite, each of which is from southeast Wyoming.

Another ten points are the small serrated-blade, corner-notched points, traditionally called Scallorn and associated with Intermediate group sites. One of these points is Smoky Hill jasper; all others are Permian chert, one of them probably Florence A.

All other points are triangular unnotched or, more commonly, side-notched specimens, or fragments thereof. This is a diverse lot, containing specimens of classes NBa1, NBa2, NBa4, NBb1, and NBb2. Permian chert dominates to the point of near exclusiveness.

The bifaces also are a very mixed lot. The most coherent subset is ten large specimens made of Permian chert (Figures 8.22, 8.23). Some of these bifaces began as large flakes worked to bifaces; others represent blocks of chert reduced to bifaces. None of these could be considered finished objects. They can be compared to the large bifaces described for 14SA424 (Chapter 6). That is, they are pieces from which bulk has been removed but that remain suitable for manufacture of a wide range of objects, either by further reducing the piece or by removing flakes that could be made into usable tools. It is not possible to assign cultural affiliation but Late Archaic would be a good guess.

Two bifaces are particularly well-formed objects. One is a pointed end segment of a narrow original specimen. It is not a projectile point and, with a 2.6:1 width:thickness ratio is moderately thick relative to its overall size. It is made of Permian chert. The other notable biface is a long (143.6 mm), narrow (33.6 mm), and thin (7.2 mm maximum; 4.3:1 width:thickness ratio) object with later margins that are straight to slightly convex and that are continu-

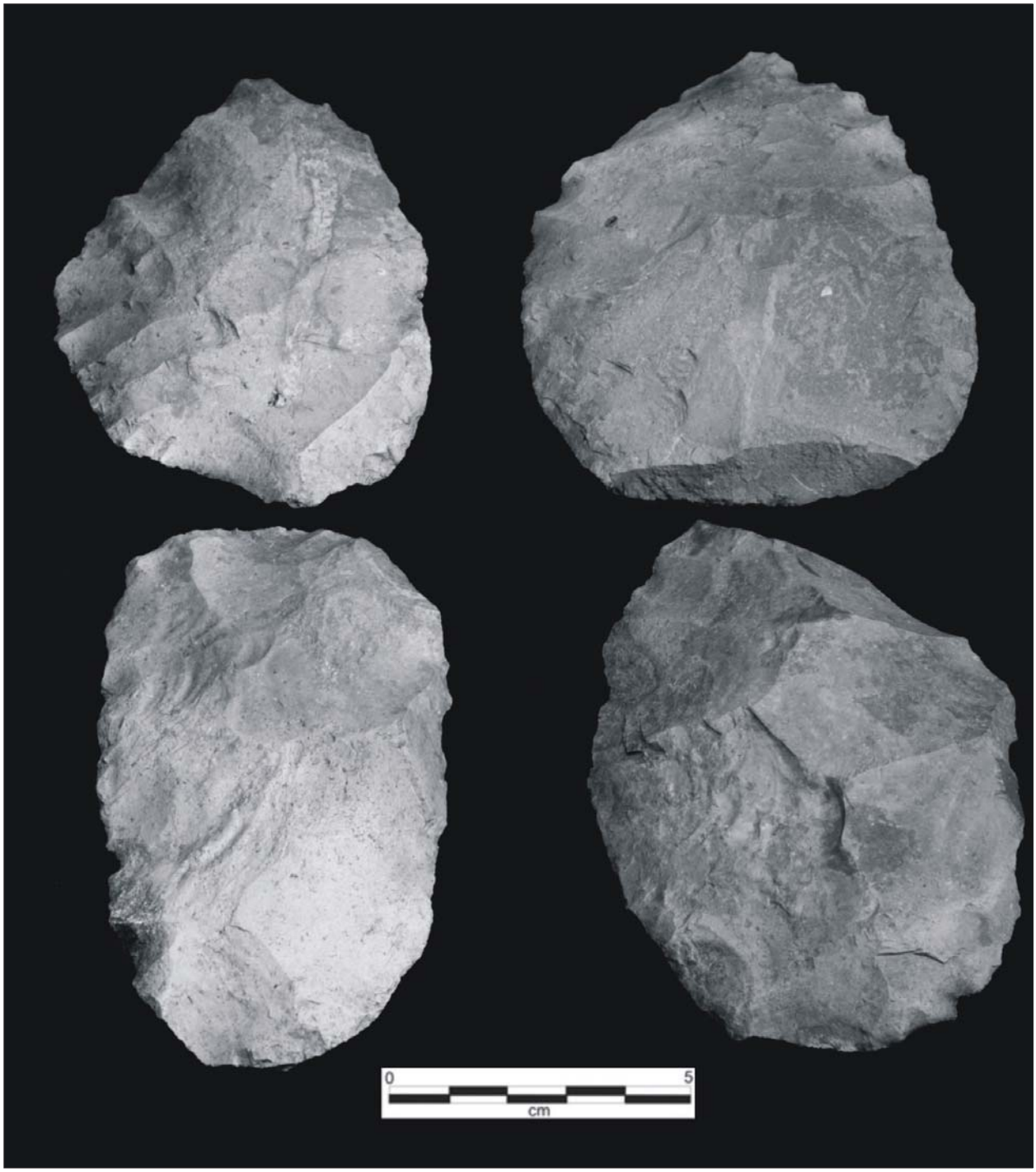


Figure 8.22. Bifacial Cores from 14SA412

ous with the rounded proximal end (Figure 8.24, on left). The lateral margins converge to a blunt distal end, and it appears from the photograph that the very distal end is broken. In fact, the piece is complete and this blunt end is the striking platform of the blade on which it was made. It obviously was not intended to be used to pierce anything. It is not in the class of the hypertrophic bifaces from 14SA1, 14SA406, 14SA409, or 14OT403, and it may or may not have had a utilitarian function, but it nevertheless is an example of excellent knapping. Its temporal affiliation is uncertain.

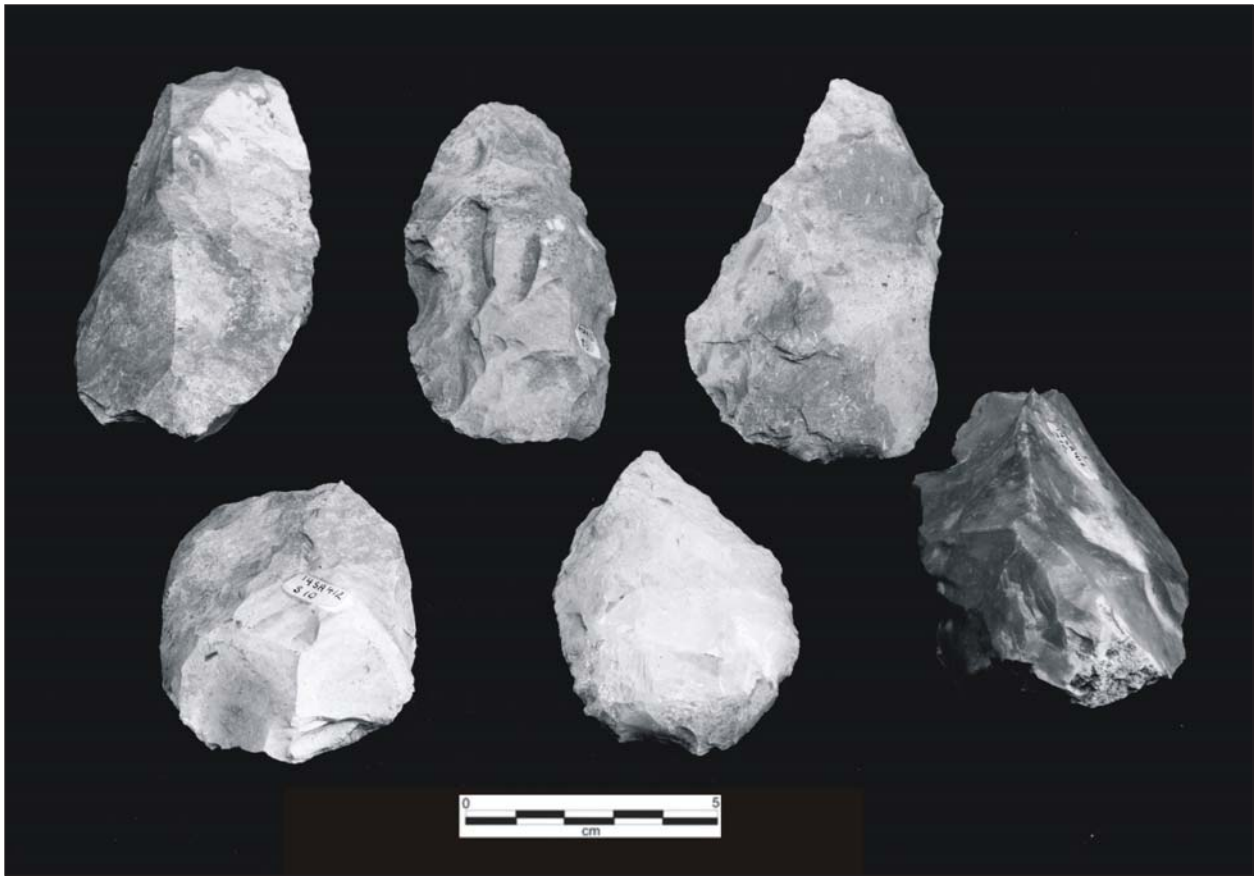


Figure 8.23. More Bifacial Cores from 14SA412

The remaining bifaces are a mix of fragments of various sizes and shapes. A few are from Harahey knives; most are too amorphous to determine original form. Permian chert predominates, and at least one piece of Spanish Diggings quartzite is present. It is, of course, totally impossible to assign temporal or cultural affiliation to these pieces and it is likely that they represent specimens accumulated over an indefinite interval of time but that may have spanned, if very intermittently, a large part of regional prehistory.

The three drills are each shaft segments, one of them a distal segment, the other two median segments, of Permian chert (Figure 8.24). As with most chipped stone tools other than projectile points, it is not possible to determine the temporal affiliation of these drills.

The abundant endscrapers (Figure 8.25) almost certainly were deposited on this site over an indeterminately long interval of time. Some certainly are attributable to the late prehistoric occupation of this site, and others are similar to those from presumed Late Archaic temporal occupations at 14SA424. Others are less obvious as to their possible cultural attributions, suggesting that they could be a mix of earlier forms. Most are made of Permian chert, some of it Florence A and some of that heat treated, but two specimens are one each of Smoky Hill jasper and Alibates agatized dolomite.

Retouched flakes, debitage, and the single core are largely Permian chert, some of it Florence A and some of that heat-treated. Some debitage is shatter, some is flakes. Retouched flakes, as is very common, are a mix of flake classes.

Groundstone objects from 14SA412 are limited. Half of the six objects are abraders, all of them of Dakota sandstone. Each is a portion of a classic U-shaped abrader with a single, regular, U-shaped groove running along the flat narrow edge. Each has some small irregular grooves on other surfaces.

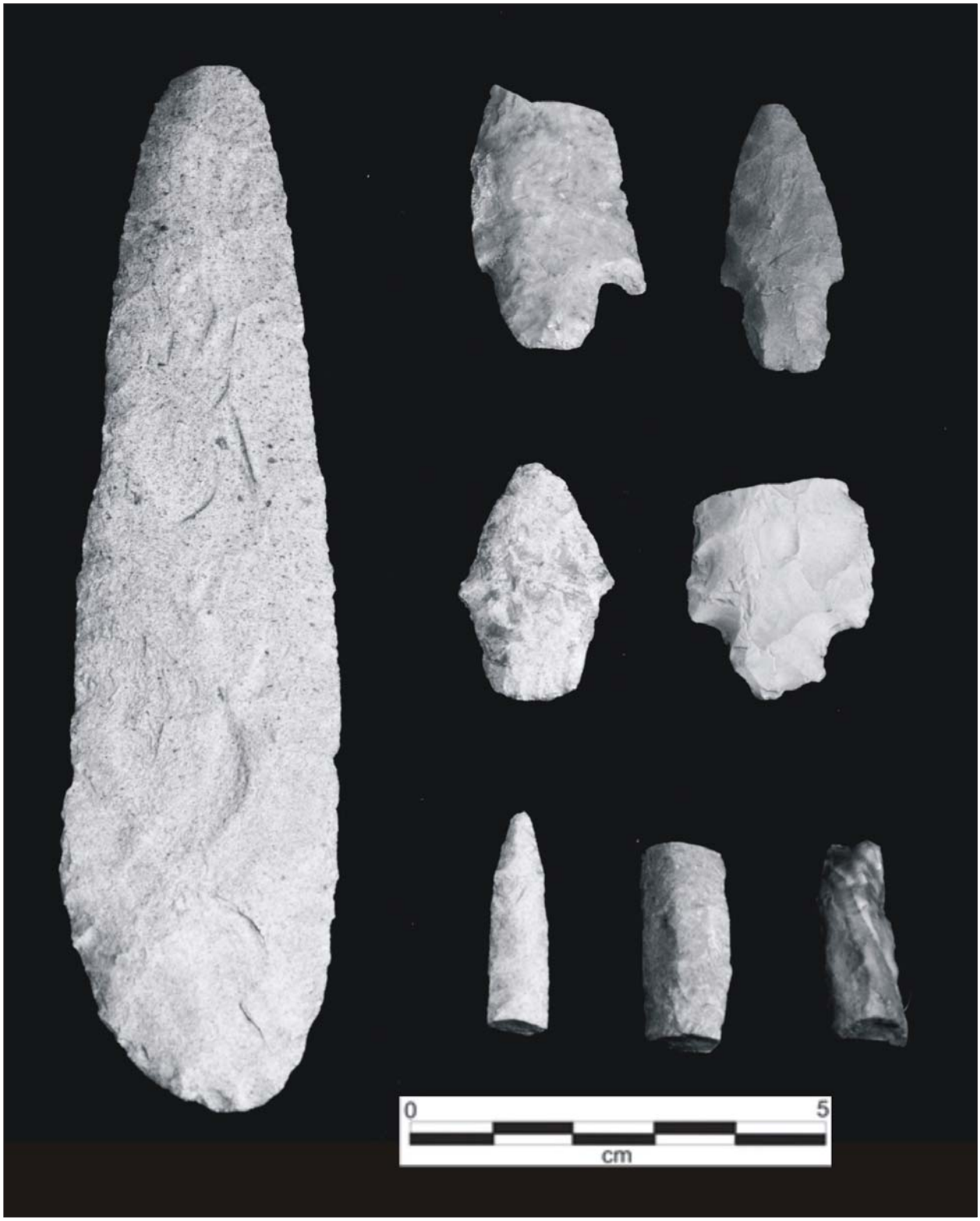


Figure 8.24. Biface, More Older Points, and Drills from 14SA412



Figure 8.25. Endscrapers from 14SA412

One Dakota sandstone object is somewhat irregular but overall is best described as a celt. It is deliberately shaped, with gently convex lateral margins that converge to a blunt, but unusually pointed poll. The cross-section is unusually rounded. The bit end is missing.

One rather large mano appears in the collection. Also of Dakota sandstone, it appears to have been deliberately shaped and could be described as loaf-shaped. The two large faces exhibit some use-wear. The piece is overall complete, but bears a number of plow scars.

A final groundstone object is a fairly small, irregularly shaped, and probably not deliberately shaped piece of Dakota sandstone with a circular depression on one surface. The quite symmetrical depression is about 2½ cm in diameter and at least 1 cm deep. The object can be identified as a nutting stone.

A single bone tool is the distal, or working, end segment of the original tool. As it appears, it could be referred to as an awl, and low power (10×) microscope examination shows some polish on the end. The piece also is large enough and blunt enough on the end that it may well have been a pressure flaker for use in manufacturing chipped stone tools. In principle, it is possible that it served both functions.

Three mussel shells in the collection are each parts of hoes. Shell hoes appear from both the Reed Collection and the Whiteford Collection to be more common than scapula hoes on this particular part of the Central Plains. It is common for them to be made on large, heavy, ridged shells, and two of these three are modest sized, thick, ridged shells. The third is a modest sized, moderately thick, but not ridged shell. None of the three are fully intact, but all retain perforations measuring more than 2.5 but less than 3.0 cm in diameter.

Eight pieces of rock are pebbles and cobbles with no obvious modification. These are large enough to have served as hammerstones, but none of them seem to exhibit the battering that results from having been used in that capacity.

It is incontestable that 14SA412 has a late prehistoric component. Although many objects are culturally and temporally indeterminate, this late

prehistoric occupation seems prominently represented in the collection. Materials from earlier occupations, however, constitute a distinctly non-negligible proportion of the collection. No one traditionally-designated period seems particularly well represented, and although the site obviously was used periodically from probably as early as Early Archaic times, nothing about the collection suggests the kind of regularly repeated and perhaps relatively frequent use that seems to be indicated at sites 14SA424 and 14SA432, described in earlier chapters.

Site 14SA437

Site 14SA437 is about three miles south of 14SA412 and [redacted] It is immediately adjacent to the Smoky Hill River, on its east (right) bank, and on the flat of the major terrace in the valley. The elevation is between 1290 and 1300 feet amsl.

Reed filed the site form for this site on January 1, 1980. At that time, he described the site as extending across about 4 acres. The site form lists the expected mix of pottery, debitage, daub, and shell on the surface. He also observed that the remains of one lodge were eroding from the river bank, and his supplemental notes, dated February 1983, suggest that he saw cultural materials also eroding from the bank away from the lodge. His recommendation, as recorded on the site form, was to recover the lodge remains before they were completely washed away. There is, however, no indication that either he or anyone else was able to act on that recommendation. More than three decades later, it may be realistic to presume that the location is completely eroded away.

Reed's collection from 14SA437 is limited to 17 objects, including five pottery sherds, one of which is a rim sherd and four of which are body sherds. Also present are one projectile point, one end-scraper, eight pieces of unmodified lithic debitage, two pieces of unmodified rock and a bag of daub pieces.

The single rim sherd is from a simple contour vessel that lacks a constricted neck. The upper parts of the vessel walls, however, converge slightly to the orifice. Less than 5% of the orifice is present, leaving unreliable any measurement of orifice diameter. The vessel lip is rounded and smoothed. The exterior surface is cord-roughened to the lip. The interior surface is not textured but is somewhat lumpy. The vessel was not decorated, at least on this upper part. Just below the point at which the rim curves inward, the exterior surface appears to be sooted, possibly reflecting use over a fire. This sherd almost certainly is from a seed jar.

The four body sherds represent fragments of three vessels, none of them the same vessel as the rim. All are cord-roughened on the exterior and smooth on the interior. None exhibits any decoration. Sherd thicknesses range from 7.0 to 10.3 mm. All pottery is mineral-tempered.

The single projectile point is the blade of a point that was side-notched, but for which no other characteristics of the haft element can be described. It was made of grey Permian chert.

A single partial tool appears to be the proximal portion of an endscraper. The ventral surface of this piece is not flat but does not exhibit retouch, while the dorsal surface is retouched partially across the face. The piece is transversely fractured and it is not possible to further describe it. The tool was made of Permian chert.

The eight pieces of debitage are all Permian chert, two of them Florence A. The latter were each heat-treated, the former were not. Two pieces are blocky shatter, one is a large blade-like flake. The remainder, including both Florence A flakes, are smaller later-stage reduction flakes.

Two pieces of rock include one chunk of Dakota Formation sandstone that itself shows no modification but could be residual from shaping other objects. The other piece of rock is a waterworn pebble with no modification.

Four pieces of daub have an aggregate mass of 191.21 gm; 127.03 gm (66.4%) is accounted for by one piece (Figure 8.26). Although all four pieces retain grass impressions, the largest one is particularly interesting. In cross-section, it is an isosceles triangle. The short face retains the impression of a post. Using a rim sherd diameter chart to evaluate the curvature, the post diameter was about 9 cm (ca. 3½ inches). One of the long faces exhibits haphazardly oriented grass fragments, the other is mostly lumpy with only an occasional grass impression. This, plus the small post size, is a good reflection of the wattle-and-daub, and not true earthlodge, construction of these lodges.

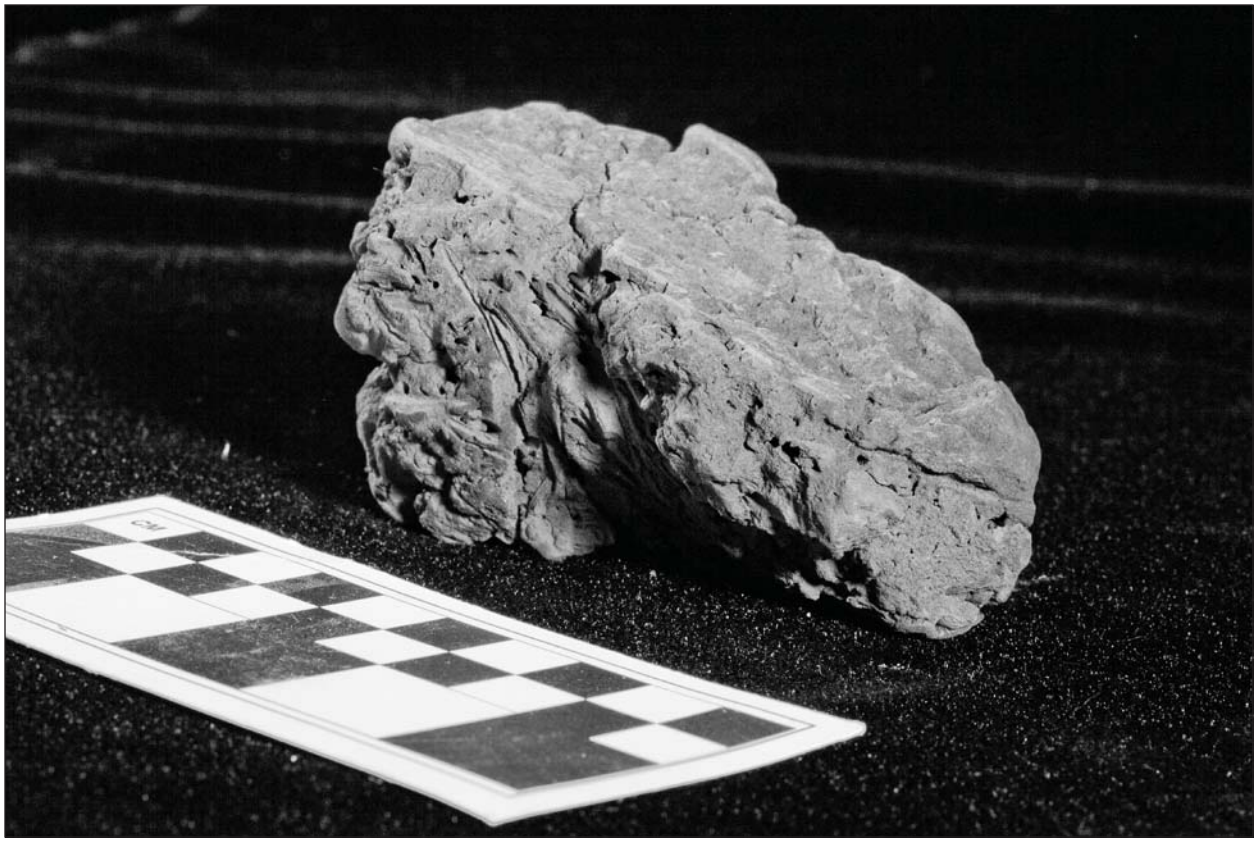


Figure 8.26. Large Pole and Grass-Impressed Daub from 14SA437

Site 14SA408

Site 14SA408 is the farthest upstream site that Reed recorded along the Smoky Hill River. It lies [redacted] is immediately adjacent to the river bank on the front edge of the terrace. The elevation is about at 1300 feet amsl.

A site form for 14SA408 is dated December 2, 1968, and is signed by Harold Reed. Here, he described the site as occupying about three acres. He also observed and/or collected the characteristic suite of pottery, chipped stone tools and debitage, groundstone, bone, and shell. No overt indicators of a lodge or lodges are noted, either on the site form or in supplemental notes, but the latter reflect his expectation that such were present. The recommendation on the site form is listed as "probably merits excavation." There are no indications that any further investigations ever occurred, and it is likely that Reed's collection and records will stand as the only indicators of the presence and nature of this site.

Reed's 14SA408 collection has 144 entries. The contents of this collection are summarized on Table 8.11.

Seven of the eight rim sherds, plus one sherd missing the lip but obviously a rim sherd with an eroded lip, are from direct rim vessels (Figure 8.27). These rims are short and the necks are indistinct and suggest a minimal constriction. In this sense, the vessel form, at least the form of the upper part of the vessel, might not differ markedly from that of the Intermediate group vessels described in Chapter 7 and cited references to collections elsewhere in Kansas. Exterior surfaces are cord-roughened to the lip. In one instance, the cord-roughening is oblique. Lips are flattened with a small bead of clay at the front edge overhanging the exterior. No decoration is present on any lip or rim sherd.

One rim sherd is collared. The collar surface and the vessel neck are cord-roughened. Cord-

Table 8.11
Collection Contents—14SA408

Material class	Object class	Count
Ceramic		
	Rim sherd	8
	Body sherd	84
Chipped stone		
	Projectile point	9
	Biface	9
	Drill	3
	Endscraper	17
	Retouched flake	11
	Debitage	1
Groundstone		
	Celt	2

roughening is incompletely smoothed on the collar only. The lip is rounded. Neither collar nor lip is decorated.

With only a single exception, the body sherds from 14SA408 are cord-roughened; the exception is a sherd from a medium-small jar that has a smooth exterior. No sherd is decorated. Body sherd thicknesses range from 5.0 to 13.0 mm with a median of 7.7 mm.

The pottery from this site has a distinct fabric composition that is not unique to this site but, in the Reed Collection, is most abundantly represented at this site. Sherds of any size seem to exhibit pits on either exterior or interior surfaces. These pits may be 3 to 4 mm in maximum dimension. They are voids resulting from leaching of calcium-based tempering agents, either limestone or bone or both. Several sherds from this collection were thin-sectioned and evaluated using a petrographic microscope. Sherds from selected other sites also have been thin-sectioned and examined petrographically. The results of this examination and comparisons among sites are presented in Chapter 10.

One projectile point is not associated with the late prehistoric occupation at this site (Figure 8.28, upper left). It is on the small side of medium sized. The haft element is a stem with slightly expanding (toward the base) lateral margins, subrounded cor-



Figure 8.27. Rim Sherds from 14SA408



Figure 8.28. Chipped Stone Objects from 14SA408

ners at the base, and a very slightly concave base. The blade is triangular with somewhat convex lateral margins. Shoulders are present and asymmetrical, but are not barbed. The point was made of Permian chert.

Other projectile points are complete or fragmentary notched or unnotched arrowpoints. Three with an identifiable haft element include one point with a side-notched with straight base (NBa1) and two points with side-notches and a straight but notched base (NBa2). All three were made of Permian chert, one of them heat-treated Florence A. The final four points are blade fragments for which it is not possible to evaluate the form of the haft. Three of these are Permian chert; the fourth is Smoky Hill jasper.

As with many, if not most, of the late prehistoric sites considered in this study, the bifaces are mostly fragmentary and usually of a form that is either irregular or indeterminate due to fragmentation. None are particularly large. All are Permian chert.

The endscrapers also are a mixed lot (Figure 8.28). Endscrapers in collections from this area tend to take two forms. One is a form that clearly was made on a blade, the other form is moderately large fairly flat flakes that have edges modified to produce a scraper edge. This particular collection has some of each, with scrapers made on blades outnumbering those on flakes. All are Permian chert, some of it heat-treated Florence A.

The dividing line between endscrapers and retouched flakes can be thin and virtually a judgment call. That is the case here. Although several retouched flakes are more or less miscellaneous flakes with some deliberate edge retouch, others are portions of blades with scraper-like continuous retouch on the lateral margins and with transverse fractures that make it impossible to determine if the piece had a working end. All retouched flakes are Permian chert.

The single piece of unmodified debitage is a fairly large flake of Permian chert.

Two groundstone objects are fairly small celts of

fine-grained Dakota sandstone. The larger of the two is 130.3 mm long, 47.7 mm in maximum width, and 29.4 mm in maximum thickness. The narrow poll end is 19.1 mm wide. The lateral margins diverge along straight to only very slightly divergent lines to the maximum width just behind the bit, then converge ever so slightly to a bit width of 42.5 mm. The bit is even, but not particularly sharp. The sandstone has a hardness of <2 on Mohs' scale. One doubts that this was a particularly effective tool. The same overall is true of the smaller celt. This specimen is 89.6 mm long, 41.5 mm in maximum width, and 30.1 mm in maximum thickness. The poll end is damaged and cannot be reliably measured but was proportionally wide. The bit is highly convex and 37.7 mm wide. It seems slightly sharper than the larger specimen.

Site 14SA409

Site 14SA409 is one of the very few lodge sites oriented to the Saline River and one of the few known sites of any class to lie on the south side of the river. In this case, the site is immediately adjacent to the current river channel. Abundant meander scars, often now appearing as closed depressions, indicate considerable channel movement in the past and leave uncertain the relation between the site and the river at the time of occupation. In any event, 14SA409 lies on the terrace surface at an elevation between 1200 and 1210 feet amsl.

The site number 14SA409 was assigned after Reed filed a site form for it on December 2, 1968. The site had been known for some time and was previously recorded as 14SA2. Guy and Mabel Whiteford's master quadrangle maps are in the 1:63,500 series maps (the standard USGS 7.5′ series maps we use today are at a scale of 1:24,000) and the pertinent map was published in 1892, so river positions have changed. It is possible that they knew the site. This is a prominent site and one of very few late prehistoric sites along the lower reaches of the Saline River, however, so the likelihood seems good that the site plotted on their maps is this one.

It is certain, though, that Jim and Richard Stauffer knew this site, as Jim wrote to the KU Anthropology Department on January 11, 1961, reporting it and providing a sketch map. Stauffer's report is based, in part, on information he and his brother obtained in 1955 when they conducted limited excavations that included exposing and then reburying 19 human skeletons. Reed's 14SA409 site folder retains a copy of Stauffer's letter. Attached to it is a copy of a KU Museum of Natural History site form, listing it as 14SA2. It is not known who filed this form and when they filed it. Jim Stauffer is listed under "other collections," so presumably it was someone other than he who completed this undated form. The online site files still have entries for both 14SA2 and 14SA409.

Harold Reed's site form, and on which the site number 14SA409 is written in Tom Witty's handwriting, was filed on December 2, 1968. On the form, Reed described the site as covering "several acres" and that its cultural affiliation "probably" included both Woodland and late prehistoric. He went on to suggest that "the older occupation lies on the eastern part of the site on a high terrace above flood plane *[sic]*, the newer area to the west is on the banks of an old stream scar." Supplemental notes provide additional important information. First, Reed suggests the site has two "areas" and probably should have had two site numbers. Further, the west area—i.e., that which he suggested on the site form is late prehistoric—"is on the north side of an old stream scar south of the Saline," on a terrace "presently quite a long ways from the present stream." He reported finding some, but not much, material south of the stream scar, and that the east area lay across a stream scar on the south side of a deep scar. He went on to say that a burial that Jim Stauffer excavated was in the west-central part of this west area.[2] Stauffer's sketch map with the earlier site form shows this, as well as 11 lodge locations, and may have been the source of Reed's information regarding the burial location. An interesting note on the on-line site form is that Donald Blakeslee and Jim Stauffer's son Brian visited the site in 2012 to get burial coordinates. At that time, they noted "a significant gap" between the burial area and the

2. Reportedly, Jim Stauffer, when young, exhibited one or two burials from this site as a science fair project. Where these burials came from, when he obtained them, their relation to the 19 burials he and his brother exposed, and the disposition of these remains are unclear to me.

debris scatter. No reconciliation was given other than "variations in site visibility over time," which always is a plausible explanation on a perennially cultivated site.

Reed's site form indicates that he had collected not only a considerable amount of material, but a considerable diversity of material. He concluded by noting that the site "merits further work." It is regrettable that this site has not received that work.

The size of Reed's 14SA409 collection, with 570 entries, is second only to that of his Minneapolis site collection. Perhaps expectably, the diversity of both material classes and object classes is somewhat higher than for other late prehistoric sites. The collection is summarized in Table 8.12.

Table 8.12
Collection Contents—14SA409

Material class	Object class	Count
Ceramic		
	Rim sherd	55
	Body sherd	96
	Pipe	1
	Daub/burned earth	3
Chipped stone		
	Projectile point	130
	Biface	67
	Drill	2
	Chert celt	2
	Endscraper	74
	Retouched flake	49
	Core	1
	Debitage	42
Groundstone		
	Mano	8
	Abrader	11
	Ax/celt	3
Rock		
	Unmodified rock	11
Bone		
	Tube	1
	Worked fragment	2
	Unmodified bone	3
	Tooth	1
Shell		
	Bead	1
	Ornament	1
	Unworked	1
Hist		
	Bullet/lead ball	5

The pottery portion of the collection includes 55 rim sherds, although data could be collected for only 47 of them, and 96 body sherds. The 47 rim sherds include 16 direct rims, 20 collared rims, seven S-rims, one T-rim, one seed bowl, and two sherds that are too fragmentary to identify rim form. All but two rim sherds are cord-roughened to the lip; the exceptions have smoothed rim surfaces. In one of these latter instances, the smoothed band occupies only the upper part of the rim and is decorated by three narrow and lightly incised, but seemingly purposefully executed, lines encircling the rim. One other direct rim, cord-roughed to the lip, is decorated with left-right incised lines. Rim heights for 45 rims on which rim height could be measured, range 7.7 to 40.9 mm, although only one rim is shorter than 16.7 mm. Median rim height is 21.6 mm.

Collared rims include six decorated and 14 undecorated specimens. Decorated collars include two on which decoration is limited to pinched nodes at the base of the collar and a third also exhibits pinched nodes in this position but is broken such that it cannot be determined if any additional design elements were once present higher on the rim. The other three decorated collars feature parallel incised lines as the main decorative motif on the collar panel. Two of these have no lip decoration and no secondary design element either above or below the parallel lines. The final rim, however, shows right-left incisions on the lip and, continuous with the lip incisions, on the rim exterior above the parallel incised lines; it also has right-left incisions below the parallel incised lines, at the base of the collar. Rim heights range from 15.6 to 34.5 mm with a median of 20.75 mm.

The seven S-rim sherds include three decorated and four undecorated rims. One of the decorated rims shows cross-hatching as the main motif, and has a zoning line above the cross-hatching as a secondary design element. Another shows punctations as the main motif with a probable zoning line above the single row of punctates (the rim is broken along this apparent zoning line), a zoning line below the punctates, and right-left incised lines below the zoning line. A final S-rim has left-right incised lines for

a main motif, a zoning line above them, and nodes on the collar base. None of these three rims has decoration on the lip, although one (the second one described) is missing the lip. Rim heights range 15.5 to 31.3 mm with a median of 23.35 mm.

A single T-rim sherd is undecorated. One rim from a seed jar also is undecorated. The two rims whose forms cannot be determined include one too short to completely evaluate decoration but lacking it on the remaining part of the rim, and one with parallel incised lines but no other part of the rim remaining to evaluate.

Several of the decorated collared and S-rims are highly reminiscent of rims on vessels from late prehistoric sites farther to the west. With one exception, however, the vessel fabric at least macroscopically is consistent with the remainder of the rims from this site. The exception is the last S-rim described above. Its temper does not match the remainder of the collection from 14SA409 or that of the pottery from many of the other sites in this area, and is not stylistically or compositionally (macroscopic observation) similar to pottery from the west.

Another ceramic artifact is a pipe bowl (Figure 8.29). It is cylindrical, with a smoothed surface and a smoothed and slightly flanged lip. Neither the lip nor the exterior surface are decorated.

The collection also contains several pieces of architectural daub with an aggregate mass of 16.43 gm.

Chipped stone is by far the predominant raw material class represented in the 14SA409 collection (Table 8.12). The chipped stone assemblage contains examples of the usual object classes but quantities of some object classes are seemingly limited relative to the overall size of the collection. Whether this is a result of collection bias or represents the contents of the site is unknown.

As Table 8.12 reflects, the collection of projectile points from 14SA409 is large. It also is rather diverse, and in ways that are somewhat of a variation on the usual variety seen in late prehistoric point classes. Three projectile points (Figure 8.30) are most certainly not attributable to the predominant late prehistoric occupation of this site. The largest of the three has a triangular blade with short barbs, now somewhat truncated by fractures. The blade lateral margins are straight and formed by regular, parallel, continuous retouch on each margin of each face. The haft element can be described as stemmed.



Figure 8.29. Ceramic Pipe Bowl from 14SA409

The lateral margins of the stem expand only slightly to the base, which is very slightly concave. What appears in the photograph to be slight damage to the base might be that, or it may have resulted from basal thinning flakes having removed somewhat more material than the knapper intended. The point is made of Permian chert. It is best attributed to Late Archaic manufacture.

A second earlier point is smaller, but still not as small as Intermediate group or late prehistoric points, or, in other words, it is not an arrowpoint. Slight, but noticeable, points of inflection about a third of the way down from the pointed tip give this blade an overall pentagonal shape. Above the points of inflection, the lateral margins are faintly to very slightly concave and converge to a quite sharp tip (the tip of a point is simply the distal point of convergence of the blade lateral margins—it is not synonymous with the blade); below this point, the margins are straight to very slightly concave. Both haft corners are damaged. The point was made of light-colored Permian chert. This probably is a late Paleoarchaic point.

A final early point has a long, narrow, isosceles triangular blade. Lateral margins are straight and well-formed by regular pressure flaking on both sides of each face. The haft is fairly short, relative to overall point size. It is corner-notched, with a slightly convex base. This also probably is a late Paleoarchaic specimen.

Small, late prehistoric points are by far the most common at this site. A form that, in traditional cultural taxonomic terms would be associated with the Intermediate group is SCa2, a small corner-notched



Figure 8.30. Older Points from 14SA409

form with a straight to convex base. These are not Scallorn points in that they are proportionally short and lack serrations on the blade margins. All such specimens in this collection are Permian chert.

Among the common late prehistoric forms, NBa and NBb points are triangular unnotched forms. The difference is that NBa points have a straight base; NBb points a concave base. Most NBa points in this collection are of Permian chert, some of it heat-treated Florence A. One point, however, is Smoky Hill jasper. The three NBb points include one each of grey Permian chert, Smoky Hill jasper, and either heat-treated Florence A or Alibates agatized dolomite (this specimen is incomplete and that, along with its small size, makes raw material identification somewhat uncertain).

NBa1 points, side-notched triangular points with straight bases, are surprisingly varied in execution. Some are very well made, at least one amounts to a flake whose edges were shaped to a point and notched but that otherwise does not exhibit much flaking on the faces, and many vary between these two extremes. These points also show more than the usual variation in blade proportions and, to an extent, overall size. All or most are Permian chert, some of it Florence A. NBa2 points exhibit less variety in manufacture than do the NBa1 points. One NBa3 point is made of Permian chert.

Six NBb2 points are, by definition, side-notched with a concave base. There is a judgment call involved here, though, for while some specimens have a classically evenly concave base, others have an inflected concavity that, in its manufacturing technology, is not a notch. At least two of these have haft corners that are not squared, as haft corners of small side-notched points usually are, but are more adequately described as lobed. These points also are of Permian chert.

The remaining specimens are fragments of points broken such that it is not possible to reliably assign them to one of the above classes or, for that matter, another small point class. Most of these fragments are Permian chert, but one specimen of Alibates agatized dolomite is identified.

As is the case with the biface assemblages from many sites described in this study, many bifaces from 14SA409 are fragments of larger originals of indeterminate original form. Most of these are Permian chert, but Smoky Hill jasper and Alibates agatized dolomite also are identified. A few biface fragments show the alternative beveling characteristic of a Harahey knife. One other was made on a particularly thick blade of Permian chert. Neither face of the piece was completely flaked, with one side showing a remnant of the ventral face of the blade original and the other, dorsal, surface retaining the negative flake scar of a previous blade removal. Nevertheless, the piece was formed by continuous flaking and retouch around the edges, resulting in asymmetrically slightly convex lateral margins and narrow, well-rounded ends continuous with the lateral margins.

A final biface is approximately one-half of a transversely broken hypertrophic biface similar to those in the Indian Burial Pit (Roper 2006:194–207) and, in the Reed Collection, 14SA407 and 14OT403. This 14SA409 piece is 80.3 mm long, meaning that the original minimally was 160.6 mm long and probably was slightly longer. It is 51.0 mm wide and 7.5 mm thick, thus giving it a width:thickness ratio of 6.8:1. Both the overall size and the width:thickness ratio are firmly within the ranges for the Whiteford site bifaces (although toward the lower end of the size range). Importantly, the technology of this biface's manufacture also matches that of the Whiteford site specimens.

This collection contains only two drills, each of them fragmentary. One was worked from a flake. It retains a portion of the flake as an irregularly-shaped haft with retouch around the edges, and portion of the shaft. The other is a portion of a shaft. Each is Permian chert.

Two chipped stone celts include one complete and one partial specimen. The complete specimen was made of Permian chert. Lateral margins are straight to very slightly convex. They converge toward, and are continuous with, a rounded poll end, and they diverge toward a convex bit end. The piece overall is thick, in part because the knapper obviously tried to, but was unsuccessful at, thinning it. The partial specimen is similar, but broken transversely. It is made of Smoky Hill jasper. This toolstone actually is a silicified chalk that occurs in all degrees of silicification, from barely silicified to a very highly silicified and fine-grained jasper-like material. This 14SA409 specimen is very similar to celts that are abundant in the Medicine Creek valley of southwest Nebraska and were preferentially made of this chalky, barely silicified, material. Such a tool would not be sharp, but it would be tough and able to withstand rough usage, such as might be associated with wood-cutting and wood-working.

The abundant endscrapers also are a mixed lot. Some are well-made tools on blades, others clearly are fragments of the same, and yet others were formed on non-blade flakes of varying and usually irregular shape and size. All scrapers on blades and most other scrapers are Permian chert.

Retouched flakes and debitage in this collection, as in most others, represent a variety of sizes, flake classes, and, for the retouched flakes, extent of retouch. Some have only casual retouch along only one part of one edge; others have continuous retouch along one, two, or more edges, others some degree of retouch lying between these extremes. Some may be fragments of more formal endscrapers, lacking the diagnostic shaped working edge. Most of these specimens are Permian chert, probably from various procurement loci in the Flint Hills.

The single core is a polyhedral core of Permian chert. The flat surface probably was effected by the removal of a single large flake. This surface then served as a striking platform for detachment of small blades or blade-like flakes around the entire perimeter of the piece. Cores like this become exhausted when the angle between the striking platform and the perimeter becomes overly acute. That happened with this piece.

The groundstone element of the collection is not particularly diverse but does include some excellent examples of specimens in several object classes. Manos may be principal among them. The eight manos include three that are intact, show signs of having been deliberately shaped, and exhibit at least one face that is well-worn from use (Figure 8.31).



Figure 8.31. Mano from 14SA409

One of these, on the unworn side, has a regular pit reminiscent of a nutting stone. A fourth mano is a fragment of a specimen that was split longitudinally, leaving most of a well-worn face. One other shows no wear but also is longitudinally split and probably is missing its worn face (the piece retaining a worn face does not refit to this specimen). The last three are large portions of manos broken transversely. As with the intact manos, each has at least one worn face. All are Dakota sandstone.

Three celts include two complete specimens and one very fragmentary piece that is only inferred to be from a celt. The two complete specimens are very similar to one another (Figure 8.32). Each is made of Dakota sandstone. The material was shaped to the subrectangular cross-section characteristic of groundstone celts. In plan view, however, the bit and poll ends are similar in width, unlike on many celts. Neither exhibits evidence of extensive use. The fragment is simply a flake that is less than 25 mm in maximum dimension. It is from a granitic rock and is highly and smoothly polished on its dorsal surface. No object class other than celt normally exhibits these characteristics when made on granitic rock and it is on this basis that the piece is inferred to come from a celt.

Eleven abraders include one that seems complete, but is short compared to known complete specimens from this general area. The remaining ten are fragments, sometimes large fragments. All specimens represent U-shaped cross-sections and a U-shaped principal groove running the length of the flat face, and possibly one or more secondary grooves on other faces. All are Dakota sandstone.

Eleven cobbles include four Dakota sandstone pieces, seven of chert or quartz rock, and one that may be of hematitic rock from Dakota Formation. Several of these may have served as hammerstones, but are not definitively battered to indicate that function.

Worked bone is very limited in this collection. The only identifiable object is a tube that was produced by ringing and snapping a mammal bone, possibly a metacarpal or metatarsal of a large mammal such as deer or bison. The other two worked pieces are fragments. One of them exhibits extensive cut marks, including a cut through the bone, and probably is from a rib. The other fragment is from a smaller long bone, again possibly a metacarpal or metatarsal of a large mammal. It was lightly burned. It has no cut marks, but the exterior is polished, possibly from use. It could be a fragment of a bone awl.

Unmodified bone is limited to two metacarpals/metatarsals from a large mammal, and one unidentified bone. One tooth is a human incisor that was turned over to the State Archaeologist for disposition in accordance with the Kansas Unmarked Burial Sites Protection Statute (UBS case number 1990–07).

Shell objects include one possibly modified shell, one small shell ornament, and one small shell bead. The shell is a nearly complete object if a straight segment along its margin represents modification to produce a working edge. The function of such a tool is uncertain, although, as David Gradwohl (1982) once pointed out, the term "shelling corn"



Figure 8.32. Celts from 14SA409

was a very literal term, and women did use mussel shells to scrape kernels from cobs. Whether shells were modified for this purpose, though, is unclear.

The ornament is a small tri-lobed piece, 9.2 mm in maximum diameter and only about 3.0 mm in maximum thickness. It clearly was cut from a shell. The outer layers of nacre were removed to smooth it and the edges were smoothed. How it was used is not at all indicated.

The shell bead is a mere 4.0 mm in diameter and 1.9 mm thick, with a central perforation measuring only about 1.2 mm in diameter. Shell beads do occur in late prehistoric sites, but usually are larger. The closest analog of which I am aware is in southeast Colorado, where small seed beads of shell or other calcium-based materials were recovered in a context dated to probably within a century or less of 14SA409 (Lindsey 2005).

As with several other sites collections, the 14SA409 collection includes several Euroamerican historic objects. In this case, the diversity of objects is limited to rifle ammunition, and includes 3 bullets or slugs, and two lead balls.

The projectile points and possibly also the pottery suggest that 14SA409 is primarily a late prehistoric site but that earlier materials also are present. The question in such a situation always is whether earlier materials represent objects collected by the late prehistoric people—a practice that apparently was reasonably common and has received comment in other parts of this chapter—or earlier occupation on this particular location. Without discounting the possibility of some of the former, it seems likely that this specific location also was used in earlier times. Indications are that the usage was light and that the occupations were short-term camp sites, and that such probably was periodically repeated. In this regard, it probably is highly notable that this location on the south side of the Saline River is directly across the river from the general area of sites 14SA424, 14SA425, 14SA431, and 14SA432, described in earlier chapters as collectively representing a long-term persistent place (a theme I will return to in Chapters 11 and 12), repeatedly used over a period of up to several millennia. Channel scar patterns as shown on the USGS quadrangle map and aerial photographs further suggest that it is not outside the realm of possibility that the river may once, or at times, have been south of this location or even that the river may once, or at times, been north of some of the other site locations. In this case, the site location could simply have been part of the larger expanse of ground comprising this persistent place.

Site 14LC301

The farthest upstream Saline River site Reed collected from is 14LC301, the Root site. This site lies in Lincoln County, [redacted] in the portion of the Saline River drainage currently affected by Wilson Lake. It is in the lower reaches of the valley of Hell Creek, a tributary of the Saline River that enters it from the south. The now-inundated landform is a ridge of a terrace extending into the Hell Creek valley from the northeast. The site lies on the flat of this terrace at an elevation of about 1520 ft amsl.

Ralph Solecki and J. Mett Shippee, working for the River Basin Surveys in 1952, originally recorded the site, but they erroneously placed it in Russell County (it is very close to the county line) and assigned it site number 14RU18. Thomas Witty filed a new site record in 1960, correctly placing the site in Lincoln County, and assigning it site number 14LC301. The online site form is filed by that number, and cross-references the original site number (a search on 14RU18 now returns no record).

On the 1960 site form, Witty noted that cultural material was found over an acre. A portion of the site, including one lodge and 11 pits, three of which were exterior to the lodge, were excavated in that year. Witty reported that excavation within two years (Witty 1962:7–31) and, with a limited exception, it is not further reviewed here. Fieldwork conducted since the 1960 excavation included a 1985 investigation by archaeologists from Wichita State University. Those individuals relocated the site and conducted shovel testing and probing with an Oakfield soil sampler, but observed and collected only a few cultural items. The overall conclusion they reached was that the site probably had been completely excavated and that it had no potential to yield further information (Blakeslee et al. 1986: 163–164).

A single radiocarbon age determination (I-509)

for the Root site assayed on wood charcoal from one of the pits, is 963±100 rcybp (Trautman 1963:73; Witty 1962:30[3]). More recently, Roper and Adair (2011:14) have reported two new radiocarbon age determinations for this site, each of them based on AMS dating of residue from ceramic vessels. These ages are 990±15 rcybp and 935±15 rcybp. Calibrated dates for these samples are in the A.D. 1000s. The three age determinations, however, are not as consistent as they appear to be and may not be accurate (Roper 2013:157). I discounted all of them in my recent analysis of late prehistoric chronology (Roper 2014).

Reed's collection contains 38 objects, including 31 undecorated body sherds. The other seven objects include four rim sherds, one biface fragment, one retouched flake, and one abrader fragment.

The rim sherds include one specimen with a 28.8 mm high collar. It is smooth, but not decorated either on the rim panel or the lip. The pottery database I maintain, at the time of writing contained data for 165 collared rims, and this is the tallest of all of them. Two other rim sherds are direct flaring rims; the last of the four rims is too short to reliably evaluate but probably also is a direct flaring rim. All rim sherds are cord-roughened to the lip. One rim has left-right incised lines on the lip but is otherwise not decorated; the other rims have no decoration on either the lip or the rim panel.

The 31 body sherds probably represent a considerably smaller number of vessels. All but one are cord-roughened; the last one is smooth. No body sherds are decorated. Thicknesses range from 3.9 to 10.8 mm, with a median of 6.05 mm.

The biface seems to be a segment retaining no part of any edge. The original size and shape, therefore, is unknown. It was made of Smoky Hill jasper. The retouched flake is a narrow but fairly thick flake apparently of Alibates agatized dolomite. Its lateral margins are parallel, and each margin has continuous single rows of retouching.

The abrader fragment comes from a shaped, grooved shaft abrader. The piece's shape is standard for shaft abraders, with a single U-shaped groove running the length of the piece.

Site 14OT5—Minneapolis Site

The Minneapolis site lies [redacted] The site is closer to Salt Creek than the Solomon River; however, this is a dynamic hydrological setting and it really is preferable to say that, at least at present, Salt Creek is closer to the site than is the Solomon River. The site lies between the two streams, adjacent to the convex outer edge of a cut-off meander of the Solomon River (Wedel 1934a:222). The current river channel is about 1000 feet to the east, while the convex outer edge of a current meander of Salt Creek is immediately to the west and south of the site. The confluence of Salt Creek with the Solomon River currently is more than 1.25 miles downstream. Where this confluence was and where exactly the channels of the Solomon River and Salt Creek were around 800 or so years ago are not known. Numerous channel scars, some of which are visible on the USGS 7.5′ Minneapolis South quadrangle map, and more of which are visible on aerial imagery, attest to considerable channel changes in past centuries. The site elevation is just above 1240 feet amsl on the undissected alluvial terrace between the two streams.

The site form listed as the original for 14OT5 was filed by Harold Reed in December 1970. This site, widely known as the Minneapolis site, was studied even before Reed was born. It is impossible to know for how long modern residents of the area recognized the antiquities on this location, but Guy and Mabel Whiteford came to know it sometime in the late 1920s or early 1930s. In July 1934, Guy Whiteford showed the site to Waldo Wedel, who at that time was a field assistant with the NSHS summer field party that was spending some time in Kansas sampling the state's archaeological resources (Wedel 1934a:211). Field notes from that summer's work document this visit on July 9, and note that the site both was "promising" and "not previously dug into" (copies of field notes on file in the 14OT5 site file, Archeology Office, KSHS). Wedel described the

3. Witty actually quoted the date as A.D. 987±100. This, however, is based on subtracting the reported radiocarbon age, 963 in this instance, from the "present" of A.D. 1950. This, however, does **not** yield a correct calendar date; a correct date has to be calculated using a calibration program. Further, the date is on wood charcoal and probably is too early for the occupation.

site as containing six to eight mounds about 10–18 inches high and about 30–40 feet across.

In that same month, the field party excavated three houses at the site: House 1, House 2, and House 3. Wedel's site report, based on a more thorough examination and mapping of the site, described "twenty-four elevations of varying size" (Wedel 1934a:218). The map (Wedel 1934a:222) shows these "elevations," i.e., house mounds, to be loosely scattered over a large area. Reportedly, the mounds still can be detected. Minneapolis subsequently became one of the three type sites of the Smoky Hill phase, or, as Wedel originally designated it, the Smoky Hill aspect (Wedel 1959:563).

Further work was conducted at the Minneapolis site in the early 1970s. In 1970, it was found that a portion of the site was within the impact area for a land-leveling project. Accordingly, the Kansas State Historical Society conducted a salvage project from late December 1970 through March 1971 ahead of construction, excavating a portion of the lodge that Wedel had numbered 24 and completely excavating House 23. The field notes for that work are on file in the KSHS Archeology Office, and a KU Master's thesis dealt with some aspects of this house's assemblage (Fosha 1994). Later in 1971, the KAA targeted Minneapolis for their summer dig, beginning excavation on House 8. Heavy rains intervened, however, and the excavation was terminated after three days (Witty 1971). The KAA returned in the summer of 1973 and completed House 8 at that time (Witty 1974). Fosha's (1994) Master's thesis also considered aspects of the House 8 assemblage. Otherwise, the 1970, 1971, and 1973 excavations are not reported in detail.

The Minneapolis site continues to hold a certain cachet as the premier Smoky Hill phase site and, perhaps for this reason, it is one site researchers repeatedly turn to when studying the late prehistoric remains in this area. Thus, in addition to Fosha's (1994) study, Beck (1998) examined pottery to study community structure and Wilke et al (2002) examined a blade cache from House 1 in comparison with other late prehistoric blade caches on the Central Plains. More recently, Roper and Hoard included pottery from House 8 along with pottery from various other sites in Kansas and southern Nebraska in a feasibility study in the application of neutron activation analysis to Central Plains tradition pottery (Roper et al. 2007). House 8 sherds also were sampled in a study using petrographic analysis and oxidation analysis to compare mineral-tempered and shell-tempered pottery and assess locus of manufacture (Roper et al. 2010). And, finally, the pottery in all excavated collections from the Minneapolis site are included in a broad study of Smoky Hill phase social organization.

Reed's collection from 14OT5, with about 1300 cataloged pieces, is not only the largest of all his collections, but it is more than twice the size of the second largest collection (14SA409). Nearly half the collection is bagged and labeled by house mound, using the house numbers Wedel assigned and mapped (1934a:222); the rest of the collection has no more specific provenience than site. In principle, having materials separated by house should allow comparisons among individual houses; in practice, the quantities of material for each individual house are too small to make meaningful and valid comparisons.

Given the size of this collection, it simply was not possible to record and present the detail presented for other collections described in this study. Instead, I have resorted to a collection summary (Table 8.13) generated from Reed's catalog. As described in Chapter 5, Reed's object class was one entry in the electronic catalog I created. In the paper versions, they are a bit free-form and contain information that is not catalog information, so my entries ignored what is not catalog information and used a restricted and enforced set of terms for object class. For other sites, I sometimes reassessed and reassigned the object class on the basis of my observations of a specific object, and entries for my material class (ceramic, chipped stone, etc.) and object class. All other collection descriptions are based on my assessments. In the 14OT5 case, however, the summary in Table 8.13 is based on Reed's object names. The correspondence should be close, but variable across material classes. Pottery counts should be virtually completely accurate. Chipped stone object class assignments may be less so. Most groundstone assessments should be equivalent. Other objects are present in small quantities.

A few comments are in order. The pottery collection obviously is voluminous, amounting to a little

more than one-third of the collection. It is useful for making some of the comparisons to be discussed in Chapter 10, as well as for other analyses. In fact, however, the number of rim sherds in this one collection is greater than the number of rim sherds from all other Reed site collections combined, and the analysis would be heavily biased by this one site's materials.

The catalog lists six ceramic discs. This is an object class that is, in the Reed Collection, unique to this site. Seen more broadly, however, it is not completely unique in the CKRA in general, although it is limited in extent to the Minneapolis locality. The Markley site House 1, excavated by the Whitefords in 1945, also contained pottery discs (Roper 2001:128). Their function is uncertain. In the Markley site report, I suggested the possibilities of spindle whorl, loom weight, or fishing net weight.

Expectably, the predominant raw material in the chipped stone portion of the collection is Permian chert. Impressionistically, little of it is Florence A, and more of it comes from sources farther north in the Flint Hills. In that sense, comments made with the descriptions for 14OT403, below, are equally pertinent to 14OT5.

As a general comment, a separate study devoted entirely to the Minneapolis site, using this collection, collections from the excavated houses, and any other collections that may exist, definitely is warranted. The Minneapolis site, and other sites in this Minneapolis locality of the lower Solomon River valley, are not like those in the Smoky Hill River valley. Certainly they share considerable material culture similarities and it is for this reason that all are assigned to the Smoky Hill phase, in the traditional taxonomy. And while I have already commented, and will further discuss in later chapters of this study, that stylistic traits of the pottery differentiate the Salina and Minneapolis communities, the differences between the two go far beyond the predominant motif on the pottery rims. The two communities are only partially contemporaneous, and the evidence as we understand it at the present strongly suggests that the two communities are differently constituted socially. I have discussed the Salina area community at some length in my study of the Whiteford site cemetery (Roper 2006), and data obtained during this study permit me to extend

Table 8.13
Collection Contents—14OT5

Material class	Object class	Count
Ceramic		
	Rim sherd	309
	Body sherd	204
	Disc	6
	Daub	27
	Miscellaneous ceramic	4
Chipped stone		
	Projectile point	214
	Biface	89
	Drill	5
	Scraper	230
	Graver	1
	Retouched flake	52
	Core	1
	Debitage	14
Groundstone		
	Abrader	48
	Celt	4
	Metate	1
	Mano	5
	Hammerstone	3
	Sandstone	5
	Stone bead	1
	Pipe	3
Rock		
	Limestone	1
	Unmodified rock	3
Bone		
	Scapula tool	1
	Worked bone	4
	Tooth	2
	Unmodified bone	21
Shell		
	Bead	1
	Disc	1
	Worked shell	1
	Unmodified shell	5
Historic		
	Glass	2
	Lead ball	1
	Slug	1
Wasp nest		2

that discussion in Chapter 11 of this book. A study of the Minneapolis community that can be laid alongside that of the Salina community would be an important contribution to the study of the archaeology of central Kansas and, for that matter, of the late prehistoric Central Plains.

Site 14OT403

Site 14OT403 is about 1500 feet northeast of the northeast end of the Minneapolis site, as both sites are mapped in the official state site files, and it is likely that it represents a continuation of the loose and irregular scatter of houses that constitutes the Minneapolis site, much as several of the Saline County sites represent extensions of the Kohr site. It is on the front edge of the terrace adjacent to the Solomon River. Its elevation is about 1240 feet amsl.

The 14OT403 site form is signed by Margie Reed and is dated July 21, 1973. The form describes the site as occupying an area of about two acres with an extensive scatter but no apparent concentrations within that area. Presumably a concentration would indicate a lodge location. An updated supplemental site form by Don Rowlison, dated October 24, 1984, noted that the site was "originally thought to be approximately one hectare [1 hectare = 2.47 acres—the two estimates are consistent with one another within the limits of rounding and estimating to whole area units]. Now 2 isolated areas located." These two isolated areas were individually plotted on a segment of the USGS quadrangle map attached to the updated supplemental form. The original site form describes the expectable list of pottery, chipped stone tools, bone, and shell collected or observed. The updated supplement defers to the original form for a list of materials collected.

The 14OT403 collection is modest, comprising 157 objects. The distribution of these objects across the various object classes is shown on Table 8.14.

Table 8.14
Collection Contents—14OT403

Material class	Object class	Count
Ceramic		
	Rim sherd	29
	Body sherd	34
	Daub	13
Chipped stone		
	Projectile point	9
	Biface	12
	Drill	1
	Endscraper	11
	Retouched flake	14
	Debitage	4
Groundstone		
	Abrader	2
	Metate	3
	Mano	2
	Hammerstone	2
Rock		
	Unmodified rock	2
Bone		
	Bead	1
	Digging stick	1
	Tool	1
	Unmodified bone	6
Shell		
	Modified	3
Historic		
	Ceramic and glass	5
	Metal	2

The 29 rim sherds include nine direct rims, eight collared rims, two S-rims, one wedge lip rim, and nine rims too fragmentary to identify form (Figure 8.33). Lip decoration, consisting of incising and punctating, appears on five rims, three of them collared, the other two one each of direct and indeterminate. Rim exterior decoration is limited to five sherds, all of them collared or S rims. Decoration in all cases consists of a single row of prominent pinches.

One body sherd is shell-tempered; the remainder are variably either mineral-tempered or grog-tempered. The shell-tempered sherd and ten of the mineral- or grog-tempered sherds have smooth surfaces. All but one of the remaining body sherds are cord-roughened, sometimes smoothed-over-cord-roughened. The exception is indeterminate. The shell-tempered sherd and two other individually numbered, but conjoining, sherds exhibit, in each case, two incised and parallel, if widely spaced, lines. The sherds, however, are too small to allow determination of the entire motif or to reliably indicate what part of the vessel is represented. Body



Figure 8.33. Rim Sherds from 14OT403

sherd thicknesses range from 4.8 to 11.5 mm, with a median of 7.7 mm.

Thirteen pieces of daub are each small and have an aggregate weight of 63.18 gm. Most show grass stem impressions and one was wrapped partially around a piece of wattle about 3.5 cm in diameter.

The chipped stone portion of this collection contains the usual set of object classes. The nine projectile points include four triangular side-notched specimens, one of which is a side-notched point with a straight base (NBa1), two of which have a straight base with a basal notch (NBa2), and one of which has double side-notches (NBa3). One other point is an unnotched triangular specimen (NBa). The other four points are one distal and three medial segments of point blades. All are of Permian chert.

Twelve bifaces are varied, as is characteristic of late prehistoric sites in the CKRA. Two are triangular pieces that are overall small but are long in proportion to their width. Two others are larger triangular specimens. They could be identified as projectile points since the dividing line between a point and a general biface can be thin. One other biface is an end segment of an alternately beveled so-called Harahey knife. All but one of the remaining bifaces are fragments of specimens of usually indeterminate original form. All are of Permian chert.

The final biface is made of Florence A chert from the south end of the Flint Hills. As often is the case with that material, it was heat-treated and in this case also is smoky. The curving transverse fracture is a heat fracture. This is a very finely-crafted piece. It is broken across the mid-section so its length cannot be reliably determined, but the fragment is 90.3 mm long. Its maximum width is 47.4 mm and its maximum thickness is 6.9 mm. The width:thickness ratio is 6.9:1. This biface has analogs in the Whiteford site cemetery as well as two other sites described earlier in this chapter (14SA407 and 14SA409).

One drill is a narrow shaft only and actually is a medial segment of the shaft. It is of Permian chert.

The endscrapers include both fragments and complete specimens. Two are Florence A chert, one of which is heat-treated; the others are grey Permian cherts.

The 14 retouched flakes actually are 15 cataloged pieces in the collection, with two separately numbered pieces conjoining. Some of these flakes may represent haft elements of broken scrapers, but most

are miscellaneous flakes made into expedient tools. All are Permian chert.

The four pieces of debitage include three blocky pieces of shatter and one unmodified flake. All are Permian chert.

One note might be inserted regarding lithic raw materials. The predominance of grey Permian cherts and the scarcity of Florence A chert is notable. Even more notable is that much of this grey chert is the banded facies sometimes referred to as Florence D and thought to be from the northern part of the Flint Hills. This is not the case in the Smoky Hill River valley sites and means that knappers in this part of the study area were getting their raw material from a different area of the Flint Hills. The mechanisms of chert procurement in the late prehistoric period are not well understood. A tacit presumption may be that people were going off on procurement forays to bring back chert (and perhaps also other commodities) but that is not necessarily correct. As I discussed in the Whiteford site study (Roper 2006a:319), it is likely that local communities maintained a land tenure system, which is to say, they claimed the territory they occupied and the resources of that territory. In this case, members of another community did not just walk in and take those resources. It is possible, however, that members of the Minneapolis area community were exchanging commodities available in their area, such as sandstone and salt, for chert, which was abundantly available in the Blue River area to the east. Emerging chronological evidence (discussed in Chapter 11) is that the Minneapolis locality and Blue River locality communities were contemporaneous with one another. The Salina area community largely was not contemporaneous with these two communities. Thus, the lithic raw material evidence might suggest that the Minneapolis community had different trade partners than did the people in the Smoky Hill River valley.

Groundstone objects are proportionally more abundant in this than in most individual site collections. Three objects of Dakota sandstone represent fragments of metates. Two more objects, also of Dakota sandstone, are mano fragments. Two Dakota sandstone abraders include one that is rectangular in cross-section with grooves on each of the four faces. Each groove is U-shaped and runs along the long axis of the tool. The other abrader is broken but still is a large part of an abrader. It is U-shaped in cross-section, with a U-shaped groove running the length of the flat upper surface of the tool. This specimen also has shallower and somewhat irregular grooves on each side.

Five cobbles include two that were judged to be hammerstones and two that might have been but do not show the edge battering associated with a hammerstone. The final piece of rock is a cobble-sized piece of siltstone that has fracture scars but no signs of use or that it is anything but natural breakage.

The bone in this collection is a mix of worked and unworked pieces. One piece is from a bison scapula and includes a remnant of the glenoid cavity and the supraglenoid tuber. Another piece is from the temporal region of a bison skull. Neither of these is worked, although the scapula fragment does exhibit cutmarks, possibly from butchering the animal. Four other pieces are small and all probably are from bison. One is a rib fragment; the other three are too fragmentary to identify to element and all are burned. Two worked pieces conjoin and are from the distal, or working end, of a digging stick. A final bone object is a small, drilled bead, from probably a skull fragment of an unidentified mammal.

Shell in the 14OT403 collection is limited to three pieces, none of them complete shells. Each fragment is from a large, thick shell, and each may have been cut to its present shape.

A small quantity of historic period Euroamerican objects date to the twentieth century. The assemblage includes two buff-colored stoneware sherds, two fragments of bottle glass (one of them the neck of a modest-size green glass bottle), one small piece of porcelain (not further identifiable), one bullet casing that Harold in his catalog listed as a .56 carbine, and one metal door latch.

14OT402

Site 14OT402 lies almost exactly [redacted] As discussed earlier, however, the position of either stream in the early second millennium is not known, nor, therefore, is it known if the confluence was above or, as it currently is, below the site at the time of occupation. At present, Salt Creek is about 300 feet away and is the closer of the two streams to the site. Since the creek currently

is at the base of its west valley wall, it cannot have been farther in earlier times. The outside of a tight meander of the Solomon River is about 600 feet to the east, and the present confluence is one-half mile to the east of the site.

Reed recorded 14OT402 in November 1971. At the time he filed the site form, he had been to the site only once. At that time, he said he collected pottery, a projectile point, and a scraper, and that he observed shell, debitage, pottery, and sandstone, but no daub. He did not give any estimate of site size. The site sketch map with the original site form seems to indicate a small site, but it also says that it might be more extensive than shown. The collection was cataloged in two episodes, one in 1980 and one in 2000, suggesting that Reed may have revisited it at least once more and collected additional material at that time. The site form, however, was never revised, and no supplemental notes give additional information about the site and the work conducted on it.

The collection is modest in size and contains the usual suite of pottery, chipped stone artifacts, groundstone artifacts, and one worked shell artifact, in addition to some unmodified material. The pottery element of the collection includes 13 rim sherds and 44 undecorated body sherds. The rim sherds represent probably no more than, but also probably no fewer than, 12 vessels. At least one additional vessel is represented by body sherds only. Three of the 13 rim sherds, including two that do not conjoin but probably are from the same vessel, are collared; the remaining ten rim sherds have a direct rim. The direct rims are fairly short and flare somewhat. No decoration appears on either the lip or exterior of the rim of any vessel. Two conjoining body sherds are shell-tempered; all other body sherds and all rim sherds are mineral-tempered.

Chipped stone objects include projectile points, bifaces, endscrapers, retouched flakes, and unmodified debitage (Figure 8.34). Five projectile points include one triangular unnotched, three side-notched, and one blade element only from an original of uncertain original form, all of Permian chert. Heat treatment is evident in one instance. The bifaces are a mixture of fragments and small complete specimens in a variety of forms. All are Permian chert. The seven endscrapers include five complete and two distal end segments. One complete specimen is Niobrara jasper; the remainder are Permian chert, which is heat-treated in two instances. The complete specimen is thin, lacks a keel, and is bifacially worked. It appears to be a repurposed biface—that is, the end morphologically is unmistakably that of a scraper working edge, but, obviously, the manufacture is not. Repurposing tools like this is common in areas where chert does not occur naturally and has to be brought in. It is notable that the width of this scraper and one of the bifaces is consistent with that of scrapers and blades in this area.

Nine retouched flakes include one heavily retouched piece of heat-treated Florence A chert made on a blade. The other pieces are irregular flakes or flake fragments with some retouch on one edge. All are Permian chert. The final chipped stone objects are ten pieces of unmodified lithic debitage. Five of these are Permian chert and two are Smoky Hill jasper, each a common raw material in this area. The other three, however, include two flakes of Alibates agatized dolomite and one of Flattop chalcedony. The primary source area of this latter material is in northeast Colorado.

Two groundstone objects include one axe and a rounded cobble that may have been a hammerstone. The axe is a complete specimen of dark granite. It is 100.9 mm long, 56.7 mm in maximum width, and 29.0 mm thick. The bit is 53.7 mm long and is at an oblique angle to the longitudinal axis of the specimen. The edge is reasonably even and is somewhat blunt. To the touch, the edge is smooth and rounded, not unlike on a worn working edge of a scraper. Low power (10×) examination with the binocular microscope is not totally definitive but does seem to reveal some edge crushing and blunting from use. The piece weighs 257 gm.

The cobble is quartzite and weighs 190 gm. It is smooth and well-rounded, with a plano-convex cross section. It fits nicely in the hand and would serve quite well as a hammerstone. Whether it actually did, however, is difficult to determine. Slightly less than one-half of the circumference is damaged, but the damage appears relatively fresh and probably is plow damage. This is exactly that part of the object that would be the more likely to show battering from use as a hammerstone.

The worked shell object is a large tubular bead (Figure 8.34., bottom row, right). It is 19.9 mm long, 13.1 mm wide, and 10.4 mm thick, and weighs



Figure 8.34. Objects from 14OT402

2.89 gm. It was bi-conically drilled. The bore is 6.9 mm at the edges of the piece and about 4.6 mm in the center. It appears to be from the hinge area of a large mussel shell that was cut and shaped prior to drilling and then, in the manner of many shell or bone beads, had the edges smoothed after drilling.

A single piece of unworked mussel shell is a partial valve retaining some of the hinge.

Finally, the collection contained two fragments of human bone. One is the proximal end of a humerus, the other is a calva fragment. These were turned over to the KSHS in accordance with the Kansas Unmarked Burial Sites Preservation Statute (UBS Number 2008-7).

Site 14OT401

Site 14OT401 is some distance from the three other Ottawa County sites just described. It lies in [redacted]

[redacted] The site lies at an elevation between 1300 and 1310 ft amsl on the west side of, and about 500 feet from, the stream. The topographic map and aerial imagery suggest that the general site area is cut by a meander scar representing a former creek channel. It is possible, therefore, that the creek was immediately adjacent to the site at the time of occupation.

This is about the only site studied here for which Reed's original site form and records were not available. The online site form indicates that the site was recorded by Reed in February 1971. It is described as extending across several acres and as possibly having suffered some potting. The form says that pottery and debitage were observed, and that pottery, scrapers, and a small knife were collected.

The 14OT401 collection is small and fragmentary. The pottery is limited to one rim sherd and six body sherds, each sherd probably from a different

vessel. The rim sherd has what could be described as a short collar, but which in current practice Roper (2008d) is calling a wedge collar. Decoration is limited to some sharp, narrow, and fairly widely spaced incisions at the base of the wedge. One body sherd has a smooth exterior; the exterior on the other sherds is smoothed-over-cord-roughened. Temper is predominantly coarse sand and is not abundant. One exception is a body sherd with a composite temper of both sand and shell. The sand grains are dark well-rounded grains that probably are from weathered Dakota sandstone and may represent natural inclusions rather than deliberately-added temper.

Chipped stone objects in this collection include two projectile points, three small bifaces, and two endscraper sections. One projectile point is the proximal portion, broken at about mid-blade, of a side-notched arrowpoint. It was made of grey Permian chert. The other point is the proximal portion, also broken around mid-blade, of a stemmed point with a slightly convex base and lobed base-haft element junctures. It has a distinctly plano-convex cross-section. The raw material is unidentified.

Three bifaces include two complete and one partial specimens. The complete biface is a small, 46-×-30.7-×-10.4 mm, ovoid object of Permian chert. The other is a thick and irregularly rectanguloid piece measuring 34.6-×-25.2-×-13.7 mm of Smoky Hill jasper. One end of this specimen is cortex, the other is a formed working edge. Low-power examination with the binocular microscope shows that the working edge itself and, to an extent, the edges of scars of the flakes that form the edge are smooth from use.

Two endscraper distal ends are present. Each is from a piece formed on a Permian chert blade by narrow marginal retouch around the lateral margins and rounded distal working end. Each is asymmetrically keeled, with the keel formed by the arris of the blade on which the specimen was made.

The two final objects in the collection are small quartzite cobbles, one of them split. The split specimen appears battered on one end, and that is at least consistent with use as a hammerstone. The other, larger and complete (172 gm), specimen may also have some battering on one end.

Site 14SM401

Site 14SM401, in Smith County, about 90 miles northwest of Salina, is a spatial outlier in Reed's collection. It is located [redacted] With the current stream configuration, the site cannot be said to be oriented toward either stream. As noted on the site form, it is on, and toward the front edge of, a terrace, at an elevation of about 1600 feet amsl. These streams do meander, but not within delimited meander belts like those of the rivers in the CKRA. Nevertheless, aerial imagery reveals cut-off meanders, meander scars, and point bars in the general site area.

Reed has no site records file for it, nor are there supplemental notes, and it is unclear how Reed came to find and record this site. Available information comes from the state site files in the KSHS Archeology Office. Reed filed the site form on February 21, 1971. The report is fairly minimal. It describes the site as material widely scattered across some terraces and an old meander scar, but does not more specifically indicate site size. It reports that pottery, points, scrapers, and drills were collected. No other information is given and no cultural affiliation was offered.

Although a site records file is lacking, the small collection from 14SM401 is cataloged, and a catalog list was in the box with the collection. This catalog contains 27 entries, and the collection contains that many objects. Of the 27, eight are pottery, 18 are chipped stone, and one is bone. Selected objects are shown in Figure 8.35.

The pottery collection includes two rim sherds and six body sherds. All are fairly sparsely tempered with coarse sand. One rim sherd is the rim and neck of an S-rim vessel. The external appearance of an S-rim is that of a collared rim, but a profile or interior view shows a channel behind the collar panel. This particular rim has a smooth interior, lip, and collar panel, but is cord-roughened through the neck of the vessel. The collar panel is decorated with three incised lines that parallel the orifice and encircle the rim. The other rim sherd is from a direct rim vessel. Neither the lip nor the rim is decorated. All body sherds are cord-roughened and lack deco-



Figure 8.35. Objects from 14SM401

ration. The thicknesses range is 3.2–6.9 mm for all but one sherd; the final sherd is 8.1 mm thick.

For as small as it is, the 14SM401 collection reveals a surprising diversity of chipped stone tool forms. Except for three objects specifically identified as something else in the descriptions below, all are of Smoky Hill jasper.

Two projectile points include one small side-notched arrowpoint (NBa1) that was transversely fractured mid-blade. The second point is from a much larger original broken through the neck and retaining only the blade. It appears to have been corner-notched or stemmed. The lightly serrated lateral margins converge to a sharp tip, but without the haft element it is impossible to know more about the point's original form. This point was made of Permian chert.

Two drills are present in the collection. One has a haft and could be a repurposed moderately small projectile point. The other is a straight drill that has cortex on one lateral margin. Apparently the knapper tried to, but was unsuccessful at, thinning this edge. The distal part of the piece is transversely broken, so we do not know the end configuration. With only one real working edge, it may not have functioned well, but it could have functioned some,

depending on the substance being drilled or perforated.

Six bifaces are all fragments of originals of varying size. Two small specimens, each fractured and irregular in shape, are of a light brown (near 5YR5/6 on the Rock-Color Chart) chalcedony. The other four include two thin medial or edge segments. One of these may be from an alternately beveled knife; the other is too fragmentary to evaluate. The final two specimens are thick fragments of large bifaces. One is a rounded, probably proximal, end segment of what may be a chipped stone celt, a rather common form in assemblages from western Central Plains tradition sites. The other is too fragmentary to evaluate, but could be from a second such object.

Three endscrapers are each of a different size. The smallest is well-formed with flaking completely covering the dorsal surface and with a pronounced keel. The largest also is completely flaked on the dorsal surface, although less regularly shaped, and also has a keel. The final endscraper is rather thin and is keeled only in the sense of retaining a ridge between two large flake scars, resulting from flake removals prior to the one used to make this tool. Marginal retouch is largely lacking, but the distal working end was shaped by a single continuous row of flakes.

Three retouched flakes are all characterized by single but continuous rows of small flakes on one or more edges of the piece. Each appears to be fragmentary. Such tools often are called sidescrapers, presumably because the retouch is similar to that on endscrapers but does not appear on an end, but flakes such as these actually are well-suited for a variety of uses.

The final chipped stone specimens are best described as cores. One is a fairly small, and possibly largely expended, bifacial core. The other is a tabular piece of raw material of high quality chert that contains numerous inclusions of cortex. Nevertheless, each face of the object reflects flake removals, possibly an ultimately futile effort to fashion the piece into a biface.

A single bone fragment is from an unidentified element of a mammal that is not identified, but was at least of medium size and possibly somewhat larger. The fragment is partially burned.

In traditional terms, 14SM401 would be identified as Upper Republican phase. The ceramic motif of parallel incised lines on an S-rim is very characteristic of this phase. The chipped stone celts also are characteristic of this western Central Plains tradition phase, as is the predominance of Smoky Hill jasper. We must, however, be careful about drawing rigid boundaries. As I work with pottery from sites across a broad stretch of northern Kansas and southern Nebraska, it becomes clear that variation is more clinal than bounded.

The presence of an older projectile point, in this case one of probable Paleoarchaic age, also is a common occurrence in sites to the west, but seems less so in collections from central Kansas sites. It presumably represents casual artifact collecting by late prehistoric peoples. The reason for the more common occurrence of this behavior farther west is uncertain, but perhaps is a simple product of more abundant older remains in this area as compared to central Kansas, for, as we saw in Chapter 6, one lesson of this study of the Reed Collection is that early remains are very sparse in this part of the Central Plains.

CHAPTER 9

Miscellaneous Sites

Site 14SA426

Gypsum Creek is the first tributary of any size, and the first named tributary, that flows to the Smoky Hill River downstream from its confluence with the Saline River. The stream rises near Canton in east-central McPherson County and flows in a remarkably unvarying course that trends due north across northeast McPherson and eastern Saline counties, eventually emptying into the Smoky Hill River from the south. Reed recorded a single site in its drainage, 14SA426. The site is near [redacted] Site 14SA426 actually is in the main valley of Gypsum Creek, next to the west valley wall. Its elevation is 1220 ft amsl.

The site form for 14SA426 is dated November 18, 1976. Reed made no additional notes for this site. At the time the site was recorded, the area was a wheat field. The site area was estimated to be "possibly an acre." Material observed included several chipped stone artifacts, tools, sandstone, and lithic debitage.

The actual collection, however, contains only two pieces, each of which is a coarse biface (Figure 9.1). One is a celt-like object of coarse quartzite. Although coarsely chipped, bit and poll ends are readily distinguished and the edges are reasonably regular. The second piece is less obviously an actual artifact, but it does appear to be a more or less ovoid biface made on a thick flake of fine sandstone.

Site 14SA445

Site 14SA445 lies [redacted] At the present time, neither stream is more closely associated with the site location. A curving tree line not aligned to modern fence lines or section lines hints that there may be an old channel scar in the site vicinity—one that does not have particularly marked topographic expression. If so, the occupation could have been on the banks of either stream. The elevation is between 1200 and 1210 ft amsl.

Reed's site form for 14SA445 is dated February 5, 1983. He describes the site area as about one acre in a cultivated field. No supplemental notes are available. The debris density probably was seen as light. Reed's collection from this site is small, although he apparently observed additional material that he did not collect.

The collection contains only ten objects, including one biface section, one endscraper, five pieces of unmodified lithic debitage, one mammal (not human) tooth fragment, and two pieces of unmodified rock (Figure 9.2).

The biface segment is a pointed end segment of an original of unknown shape and size. One edge of one face is steeply beveled, suggesting that the original *could* have been a Harahey knife. The rest of the piece is consistent with that, although that is not sufficient to identify it as such and the identification will remain tentative for present purposes—the appearance of the piece could be fortuitous. The biface was made of Permian chert.

The endscraper is a distal portion of an original tool made on a thick flake of Permian chert. The dorsal surface of the flake original is covered with cortex. The tool was formed by a single row of retouch flakes that are continuous from one lateral margin, through the distal end, to the other lateral margin. The retouch is steep on one lateral margin (the left side in the photograph) and the distal end, and is much less steep on the other lateral margin. While the piece is not keeled, the steep retouch on one lateral margin gives it a mild and asymmetrical keeled effect.

All five pieces of debitage are flakes of varying



Figure 9.1. Objects from 14SA426

size. Four retain some amount of cortex. It is likely that the five pieces are from five separate nodules.

The tooth is too fragmentary to identify, except that probably it is from a large mammal. One piece of rock is a limestone pebble; the other is a slab of sandstone that shows no evidence of deliberate modification. It is grooved on one face, but the grooves appear fresh and probably result from the piece being repeatedly hit by a plow or disc.

Site 14SA404

Site 14SA404 is more or less in a line directly west of the late prehistoric lodge sites along the Smoky



Figure 9.2. Objects from 14SA445

Hill River as it has turned to flow to the east in a position northeast of Salina. The site is, however, a little more than [redacted] Although it is roughly three miles or so upstream from the confluence of Mulberry Creek with the Saline River, this position actually is within the joint valley of both streams. This places 14SA404 within the western part of the large broad riverine area associated with the Smoky Hill/Saline/Solomon rivers confluence area, described in Chapter 3. In fact, the east end of the upland ridge that forms the drainage divide between the Saline River and Mulberry Creek is about a mile west of the site and the valley of each of those streams narrows markedly a short distance upstream from the site area. The site elevation is about 1220 ft amsl on the edge of a terrace on the west (left) side of Mulberry Creek.

Harold Reed dated the original site form for 14SA404 on February 20, 1969. As he described it at that time, the site material was widely scattered over 4 to 6 acres in a cultivated field. He noted then that the site "doesn't merit much time" and there is no evidence that he ever did spend any more time with it. There are no supplemental notes for this site.

The 14SA404 collection is limited to ten objects, all of them chipped stone artifacts (Figure 9.3). Two projectile point segments include one piece that includes a distal end and probably represents most of the blade of a small late prehistoric-age point. The other point segment is the haft corner of a side-notched, straight-based specimen, also of late prehistoric age. Both points were made of Permian chert.

Two bifaces are each fragmentary. One is a rounded end segment of a small thin specimen of Permian chert. The other, made of white chert that possibly is from the Burlington Formation to the east, is a portion of the rounded end of an overall larger, although still thin, specimen of indeterminate original form.

Two endscrapers are complete or nearly complete. The complete specimen has a keel and a slight spur, apparently intentional, on the left corner of the distal working edge. This scraper is made of good quality, fine-grained Smoky Hill jasper. The partial specimen is the distal portion of a scraper with an off-center keel. It is made of translucent chalcedony that likely is from a primary source area to the west.

The collection contains three retouched flakes, all of Permian chert. Two are partial flakes with retouch on one or more edges. The third is a large flake with continuous retouch around the margins. It resembles an endscraper, although it lacks the formal appearance of a deliberately-formed specimen, and may have been a large flake expediently retouched to perform a scraping function.

The final 14SA404 object is a small core. The raw material is not certainly identified.

14SA444—Mound Site

The only Harold Reed-recorded site in the lower Saline River valley that is not in the river bottoms is 14SA444. This site lies [redacted] Its elevation is at or above 1310 feet amsl or around 100 feet above the valley floor. The ridge is defined by short intermittent drainages leading from the higher parts of the upland that have dissected the bluff edge. Without the dissection, the bluff edge would be fairly smooth; thus, this ridge does not extend into the river valley or have any special prominence.

The site form for 14SA444 was completed by Harold Reed on February 5, 1983. It is an earth-and-stone artificially-constructed mound about 30 feet in diameter and 30 inches high. It lies about 50 to 75 feet back from the fairly steep bluff edge. One 36-inch diameter hole was observed in the center of the mound and probably represents a pothole dug by an unknown person. Reed reported at that time that the landowner said the hole had to have been dug more than 25 years earlier.

According to the site form, Reed collected one chert flake and a "handful of burned bone," identified as probably human. Reed described it as badly fragmented. He also indicated on the site form that he had returned the material to the mound; thus, there is no collection from 14SA444.

All circumstances point to 14SA444 being a burial mound. Rock and earth mounds are (or were) numerous in portions of the Kansas River basin. They are especially well-known throughout the stream bluffs in the greater Manhattan area and

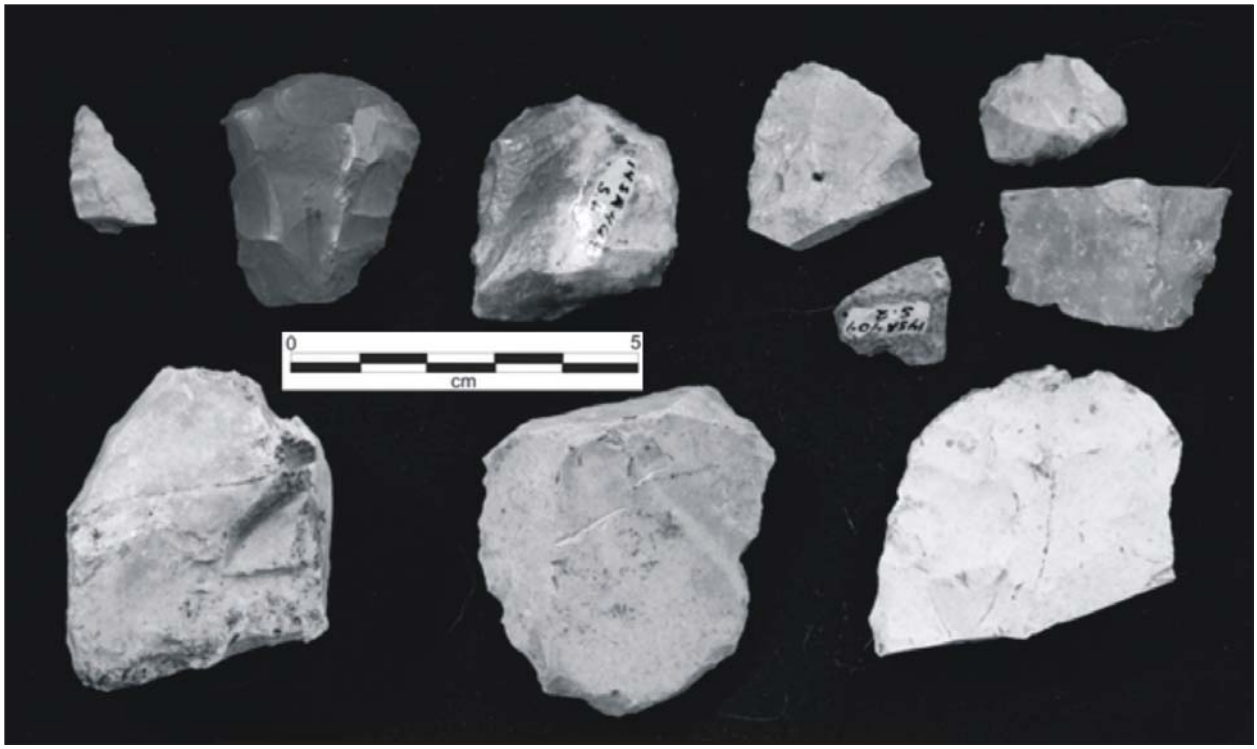


Figure 9.3. Objects from 14SA404

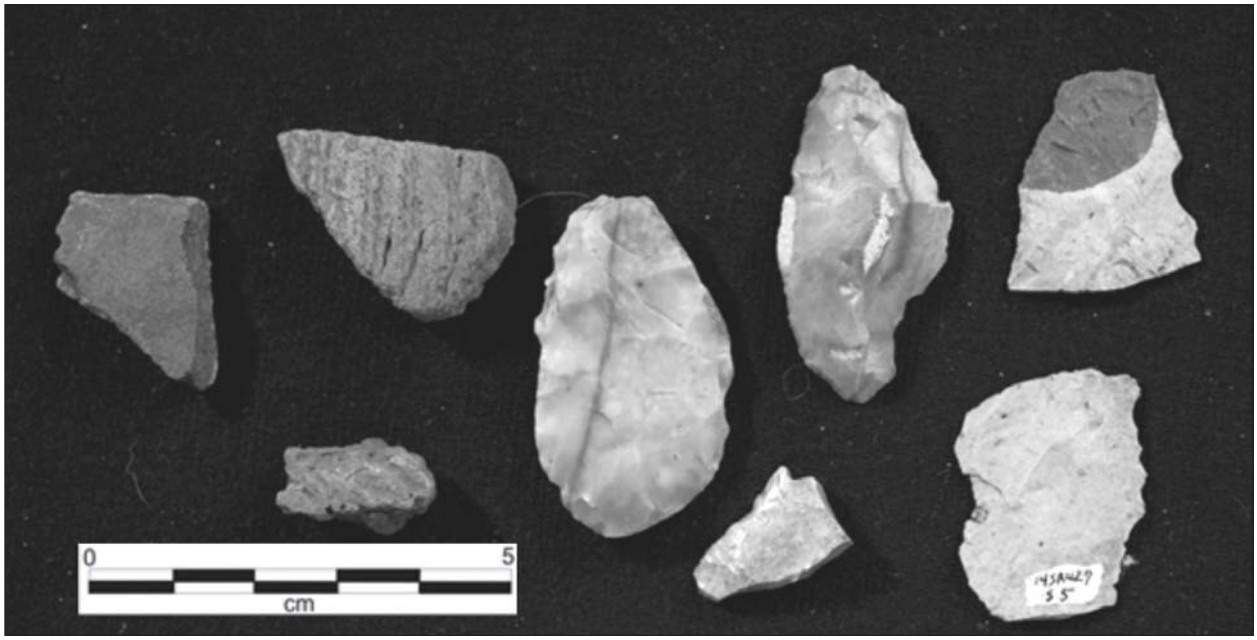


Figure 9.4. Objects from 14SA427

west to at least the vicinity of Junction City and the lower Republican River valley. This knowledge may be due in part to the activities of individuals such as a group of Manhattanites who excavated mounds in that area in the late nineteenth century (e.g., Failyer 1881) and of Floyd Schultz of Clay Center who excavated many mounds in the lower Republican River valley in the 1920s and 1930s (Hawley 1993). On the other hand, sometimes these occurrences are because the resources are most prominent in those areas—sometimes the lack of excavation of mounds in an area is because there are few or no mounds to excavate. According to a recent analysis (Roper 2006a:296–297), 14SA444 is among the western-most, although not *the* western-most burial mound in Kansas. In fact, J.A. Udden (1900:11), although giving few details, mentioned seeing and opening mounds in Salina and McPherson counties. Without additional information and with no diagnostic artifacts it is difficult to attribute temporal or cultural affiliation. The fragmentary and burnt bone is consistent with remains from mound sites farther downstream in the Smoky Hill, Republican, and Kansas river valleys.

14SA427—Possible Great Bend Aspect Campsite

Site 14SA427 is the northernmost of three closely-spaced sites on the east (right) of the Smoky Hill River valley [redacted]. The site lies on the front edge of a terrace, immediately adjacent to the river. A very short draw bounding the site's south edge likely formed in modern times after the surface was opened to cultivation. The elevation is about 1280 feet amsl.

The site form for this site is dated February 26, 1978, and is signed by Harold and Debbie Reed. It describes the site as covering about 2 acres in a cultivated field. Material collected is described below. The form notes on the *Material Observed* line that "a great deal of chert flakes are to be found here." Although the form expressed a doubt that this site contains a lodge, further survey was recommended. No supplemental notes are available to provide further information.

The 14SA427 collection contains 30 objects (Figure 9.4). Three of these are ceramic body sherds, all of them small mineral-tempered specimens. Two are cord-roughened, the third has a smooth exterior surface. This smooth-surfaced sherd, although small, stands out from the majority of the pottery in the Reed collections. Its overall appearance is consistent with the pottery from Great Bend aspect, Little River focus, sites in Rice and McPherson counties.

The rest of the collection is entirely chipped stone objects. These include two bifaces, four retouched flakes, and 21 pieces of unmodified debitage. One biface is a small ovoid specimen of a high-quality material that is not positively identified but may be Alibates agatized dolomite. The other biface is a small edge segment of a specimen of completely indeterminate original shape and size. All four retouched flakes and ten of the 21 pieces of debitage are Permian chert. Another ten are Florence A from the south end of the Flint Hills. Seven of these ten were heat-treated. The final flake is Smoky Hill jasper.

The collection is not certainly temporally or culturally diagnostic, but it may represent a small Great Bend aspect camp. Ample precedents are available, for small Great Bend aspect sites are reported from scattered locations throughout central and south-central Kansas (Peck 2003), including elsewhere in Saline County (Peck 2003:43–45). These are not village sites. They sometimes are called hunting camps, and they may be that or they may simply be small camps for extraction of other resources. We currently know the Great Bend aspect mostly from its village sites and actually do not yet understand the entire settlement system. The lithic raw materials represented here are completely consistent with those from Great Bend aspect sites in Rice and McPherson counties (Ryan 2008; Sundermeyer 2005; Zehnder 1998). The presence of cord-roughened pottery does not necessarily contradict that, because cord-roughed pottery does occur in substantial proportion in early Great Bend aspect sites (Loosle 1991; Roper 2011).

CHAPTER 10

Pottery Analysis

The preceding four chapters have described the Reed Collection sites and the materials from them. Chapter 11 will synthesize the prehistory of the CKRA based primarily on this collection, but jumping directly from description to synthesis overlooks information that will contribute to the synthesis. Remembering from Chapter 5 that the objects and the sites are not in themselves data, but that data are observations and measurements made about them, a valuable intermediate step between description and synthesis is analysis of data derived from objects in the collection. This collection is sufficiently rich that, as indicated near the end of Chapter 5, many observations could be made and many analyses could be performed. To do all of them would require time and resources far beyond what is available for this study. Perhaps the most basic of them, however, is a study of the pottery in these assemblages. This too could become a time-consuming analysis, although without thought it also could reach too far—these are surface collections, after all, and sometimes the number of sherds in a collection is not particularly large.

Four aspects of the pottery in these collections are pertinent to some of the themes to be explored in the interpretive account and can feasibly be analyzed to some degree with data from this collection. These four include variation in pottery fabric, changing vessel form, trends in pottery thickness, and pottery style considered in greater detail than the traditional typologies allow. In no case should these analyses be considered final; in no case should it be said that the author is arguing for a specific interpretation of the results. Rather, the analyses should be taken as observations about characteristics of these assemblages as we have them, and the interpretations should be taken as suggestions—some might call them hypotheses, although that strains the term—subject to further study as possible. Obviously the best study would be based on complete, and larger, assemblages from well-excavated sites. Those data are, however, limited and, given the poor state of preservation of sites in the CKRA, some more inclusive analyses may be forever precluded. The alternative is to throw up our hands and suggest we can do nothing. That is a defeatist attitude and an option I choose not to take. Archaeology, like many sciences, is an iterative process—i.e., we start with what we have, select and record observations on those materials, analyze those data, draw tentative conclusions, present those conclusions as propositions for further consideration, and hope that it becomes feasible to conduct that further consideration (and that we can repeat the process). This is the option I choose to take. In a real sense, it is a data exploration study, a process too little used to develop an understanding of a body of data and formulate propositions for more rigorous testing.

The material for this analysis is the pottery in the collections described in the earlier chapters. Since, however, the study area is in many respects an arbitrarily bounded area, some relations within it are best understood by making broader comparisons, so data from Reed Collection pottery are usually augmented by data from other collections from some of the same sites or nearby sites from which Reed did not collect. This includes data from materials in excavated collections. I also use data recorded for material in collections curated at the KSHS from several sites along the Smoky Hill River valley in northern McPherson County. The discussion will make clear what specific materials are part of each analysis and why some material from beyond the study area is included in some parts of the analysis.

Variation in the Characteristics of Pottery Fabric

The term pottery fabric is used here as defined by Rice (1987:476), and denotes the clay, inclusions, whether natural or deliberately added, and pores

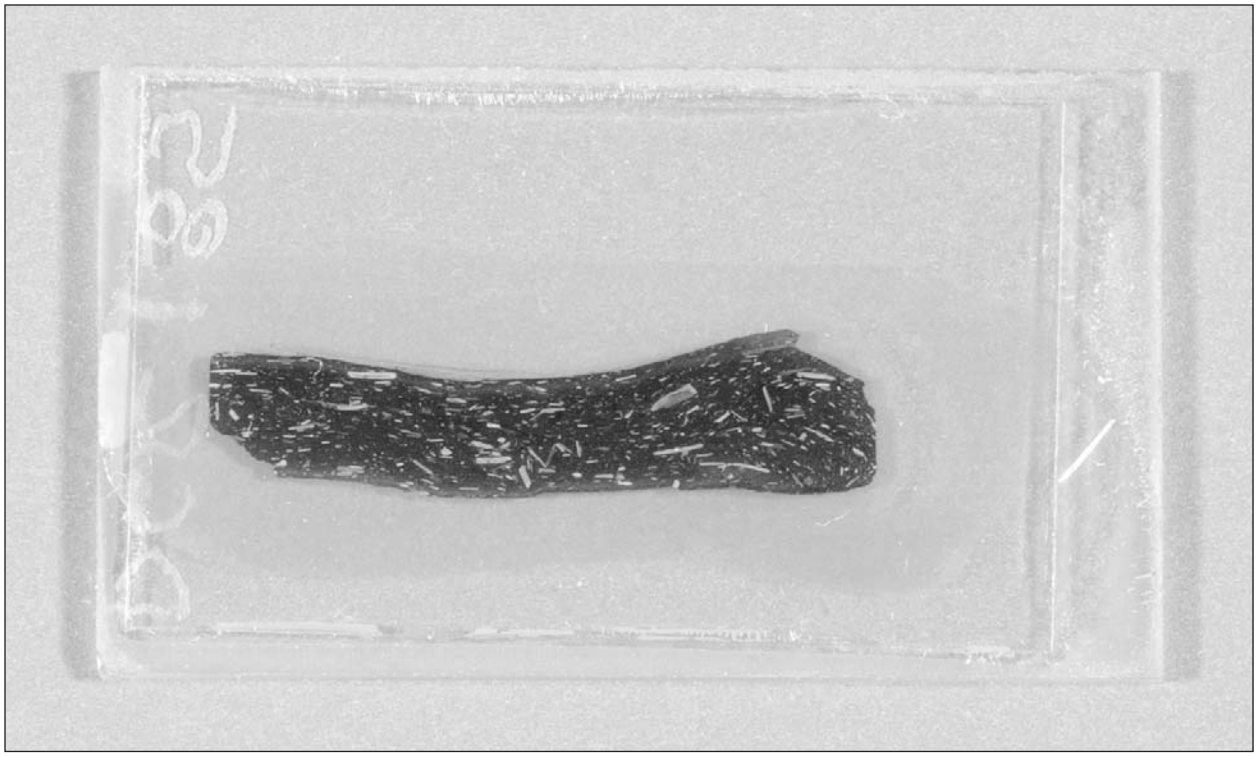


Figure 10.1. Thin-Sectioned Sherd

that compose a pottery vessel. Body is an alternative term, but the term fabric is preferred to avoid confusion with the meaning of a vessel body as the portion of a vessel below its neck. Fabric also is distinct from the term paste, which is clay and inclusions, but not pores (Rice 1987:479), or even clay and natural inclusions, but neither pores nor deliberately added temper (Stoltman 2001:304). The raw material used for pottery manufacture often contains inclusions larger than clay particles, including particles of silt and sand. These may or may not be removed in the course of preparing the raw material for pottery manufacture. The deliberate addition of aplastic inclusions is the act of tempering the raw material. The term temper, therefore, strictly refers to only those inclusions that are deliberately added to the raw material. Temper material may include sand, often sand that is coarser than that naturally occurring in the raw material and will be identified when a distribution analysis of the inclusion sizes appears to be bimodal. Other potential tempering material in Central Plains assemblages includes limestone, sandstone, grog, bone, and shell. Grog is crushed sherds. Shell occurs in small quantity in some of the late prehistoric sites in Ottawa County (Solomon River valley), but is, without exception, absent from Saline County (Smoky Hill River valley, Saline River valley) sites. Sandstone, in spite of its prominence as a bedrock bounding the CKRA, actually is only occasionally observed as a tempering agent in pottery from this area. Limestone, grog, bone, and coarse sand all appear in vessel assemblages in the area. They do not, however, appear randomly, and some consideration of temper and general fabric variation in the study area is foundational for other parts of the discussion in this chapter and Chapter 11.

Pottery temper can be difficult to reliably identify in a sherd without a fresh break, and other fabric characteristics are even more difficult, if not impossible, to determine even from a freshly broken sherd edge. Accordingly, a set of thin-sections were prepared on five sherds selected from each of three sites described in this study and one other nearby site. These include 14SA403 and 14MP407 in the KSHS collections, as well as, with Margie Reed's consent, 14SA415 and 14SA408 in the Reed Collection.

It largely is a side issue to this study to detail the

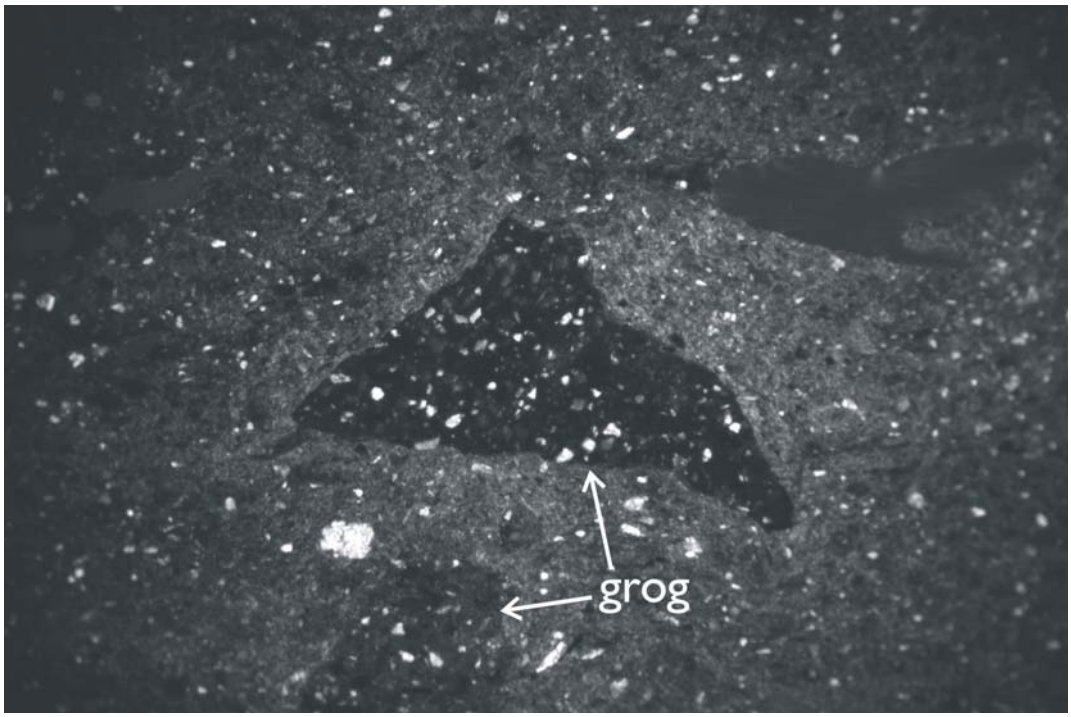


Figure 10.2. Photomicrograph of Thin Section from 14SA415, Showing Grog Temper Particles

process of thin-sectioning sherds and examining the thin-sections but briefly, a thin-section is exactly what it says it is: a very thin, 30 µm (read micron; 0.0030 mm), slice through a sherd (Figure 10.1). The slice is mounted on a glass microscope slide and examined under a petrographic microscope, which is a microscope equipped to transmit polarized light through the sections, called plane polarized light (PPL), and to add a second polarizer that modifies the light by rotating the microscope stage, logically enough called cross-polarized light (XPL). This latter highlights the varying optical properties of minerals to permit their identification. Petrography as an analytic technique is established within geology and soils, but ceramics are, in a very real sense, an artificial igneous rock, so petrography also has long been used by archaeologists to evaluate fabric composition as seen in thin section to help determine if pots were made locally or obtained from some distance. More recently, petrography also is being used for studying other characteristics of the pottery fabric to help understand manufacturing technology, including raw material properties, forming, and firing. Quinn (2013) and Reedy (2008) each review the multiple uses of petrography for studying ceramics.

The 20 thin-sections discussed here were prepared at National Petrographic Service, Inc., in Houston, Texas. The sections were initially examined and described by Richard Josephs (Josephs 2010), a geology/soils petrographer. The discussion that follows uses Josephs' identifications of inclusions, including temper, as well as some of his descriptions of other fabric characteristics, but augments them with information from my own examination of the thin-sections from a manufacturing and technological perspective. Terminology tends to follow that of Quinn (2013) who details an analysis protocol that addresses the behavioral implications of the observations in addition to recording the characteristics of the fabric using a consistent terminology. It is, of course, the past behavior and not simply the descriptive characteristics of the sherds that is of interest to the archaeologist and is the objective of this commentary.

Four pottery fabric groups (see Quinn 2013 on the formation of fabric groups, or Quinn and Burton 2008 for an example), based on two main

source clay types, and major temper variation, are recognized in this set of thin-sections. The predominant clay source type is an alluvial clay used in three major paste recipes. One of these, well-represented at 14SA415 and 14SA403, combines this clay with grog temper (Figure 10.2). Natural inclusions in both the sectioned sherd and the grog are virtually identical, indicating that the grog resulted from crushing pots (or, more likely, broken pot sections) made with the same paste recipe. Sites 14SA415 and 14SA403 are only a little over a mile apart and each site was located on the terrace at the edge of the meander belt. The alluvial clays would have been immediately available at each location, and it appears that the potters were using tempering materials, i.e., grog, that would have been readily to hand on the farmstead (at least after the first pot broke). That this must have been a habit is shown by the occasional indication that the grog itself came from a grog-tempered vessel (this is reflected in the grog particles in Figure 10.2). However, in this broad valley, it is some distance to places where other possible temper materials could have been readily procured—well beyond the 1 km radius from which traditional potters characteristically obtain their clay and temper material (Arnold 1985:50).

The second fabric group, in which the temper is simply coarse to very coarse quartz sand grains, may be a variation on this that also reflects the alluvial setting. The coarse sand grains may represent deliberately added temper, but they also may instead represent particles not cleaned from the raw clay and intentionally left to function in the same manner as deliberately added temper. This fabric class is less well represented in at least the thin sections from 14SA403 and 14SA415. It might reflect procurement of pottery clay from overall the same source but from a slightly different landscape position than the other material. Assuming it does, it reflects an opportunistic procurement of potting clay from the landscape rather than the maintenance of specially designated locations for digging clay to make pots.

The other two fabric groups characterize the assemblages from 14SA408 and 14MP407 and, macroscopically, the pottery from other sites in this general area. The first, and much more common, of the two used the same general type of alluvial clay as that indicated above, but the temper is coarse angular particles of bone and/or limestone (Figure 10.3). The second fabric class represented at these two sites appears to have used a source clay with a lower organic matter content. Sandstone or shale are predominant inclusions, and argillaceous inclusions that may be grog or, on the basis of less clearly defined edges and rounded outlines, natural clay pellets (cf. Whitbread 1986). This clay may be from a setting near or into the uplands where the bedrock substrate is sandstone and shale. Site 14MP407 overlooks the alluvial terrace but actually is on a low upland ridge, while 14SA408 is adjacent to the river but on a toe slope overlooking the terrace and immediately adjacent to an upland setting. Thus, both alluvium and upland loess and bedrock regolith were immediately available to the potters at these two sites.

This limestone/bone-tempered fabric class is readily recognized macroscopically because limestone and bone are each calcium based and often show post-deposition leaching that left noticeable pits on each surface (Figure 10.4). It is readily identified not only in the two collections sampled for thin-sectioning and petrographic analysis, but also in collections from other sites along the Smoky Hill River from the Bridgeport area, where 14SA408 lies, and west through northern McPherson County (and possibly beyond, although I have not looked at collections from beyond McPherson County), and including 14MP407, which is near Lindsborg. An occasional sherd occurs in collections from sites north of 14SA408 but, in general, there is little overlap of occurrence between these coarse-tempered sherds and the grog- or sand-tempered material, such as that identified at 14SA403 and 14SA415. All fabric evidence thus points to individual household manufacture and consumption of pottery.

Finally, clays are very similar throughout the Central Plains and neither neutron activation analysis (NAA) nor oxidation analysis differentiate them over a large area (Roper et al 2007; Roper et al. 2010; Speakman 2010; unpublished oxidation analysis data for some of these sherds). Given the geological variation of the Central Plains, however, a previously-published study using petrographic analysis (Roper et al. 2010) drew on the identification of the natural mineral inclusions to show that pottery was locally produced in a broader area of central and

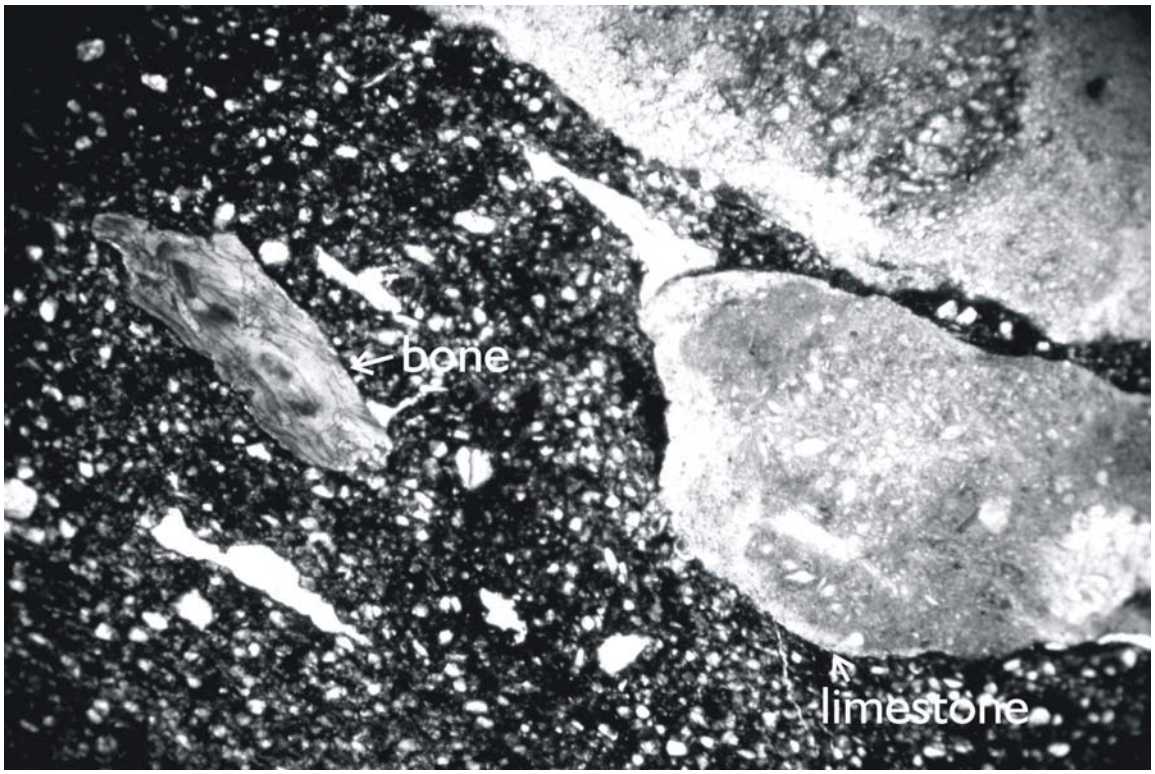


Figure 10.3. Photomicrograph of Thin Section from 14SA408, Showing Bone and Limestone Temper Particles

eastern Kansas that is continuous with, but did not include, this study area. This is possible because of how the variety in bedrock across the Plains affects sediment composition (Chapter 3). As expected, the findings for this study area are completely consistent with results reported in that earlier study. The thin-sections from 14SA403, 14SA415, 14SA408, and 14MP407 further indicate that very localized, almost site-specific, settings also factor into the composition of a ceramic fabric. To be sure, potters made some choices regarding temper—the potters at 14SA403, 14SA415, and nearby sites, *could* have used bone, but they didn't, while those at 14SA408, 14MP407, and nearby sites *could* have used grog, but they didn't. Overall, though, their choices consistently were made among materials available in a very restricted area surrounding their farmsteads.

Changing Vessel Form

Pottery is not simply the object class that the archaeologist most relies upon for cultural identification and, in pottery-using traditional societies, it was not simply an art form. It also, and it principally, was a technology involved in preparing, serving, and consuming food. The utensils and tableware in our contemporary kitchens vary in form and size, depending upon the function an item normally is called upon to perform. The same holds true in societies that use traditional pottery for cooking and



Figure 10.4. Interior of a Sherd from 14SA408, Showing Pits from Leaching of the Temper

serving—that is, pottery vessels are designed and manufactured to facilitate the functions they are to perform. They therefore exhibit what Skibo and Schiffer (2008:12) call performance characteristics, which is to say, characteristics that enable an object to perform adequately. For example, Ralph Linton, in an article published in 1944, without using the term performance characteristic, nevertheless recognized and nicely illustrated the concept when he said of pottery that:

> It is often impossible to say whether a particular piece of pottery, found archaeologically, was used for boiling food or not, but it is relatively easy to determine whether it was suited for boiling. Although it is perfectly feasible to boil fluids in broad, shallow utensils such as bowls, we find that, in practice, vessels of this type are rarely used for boiling. Moreover, it seems that they are never the dominant form employed for this purpose when vessels of other shapes are available. The wide mouths of bowls provide so much surface for evaporation relative to the heating surface and fluid content that such utensils soon boil dry. They are adapted to warming fluids or to brief cooking but not to the slow, long-continued boiling required by most staple foods. Conversely, vessels with relatively narrow, constricted mouths, especially when these are combined with elongated necks, are also unsuited to food boiling. In such forms the steam generated in the body of the vessel becomes too concentrated at its mouth, causing the contents to boil over (Linton 1944:370).

This is not to exclude stylistic decisions by the potter as she forms a vessel, but to suggest that functional considerations—performance characteristics—will strongly affect the basic overall form of the vessel.

In its functional capacity, pottery is a part of a society's foodway, which Paul Welch and Margaret Scarry (1995:397) defined as "the whole complex of behaviors by which we produce, prepare, present, and consume" food. The concept of a foodway thus considers not only diet, i.e., the foods eaten, and how they are procured and prepared (or processed), i.e., subsistence, but also the technological and other aspects of food's procurement or production, presentation, and consumption, in a manner that the paleoethnobotanist Leslie Bush (2004:12) describes



Figure 10.5. Concept of Foodway in Relation to Diet and Subsistence

as progressively more inclusive (Figure 10.5). It follows, therefore, that as diet and subsistence change, new functional demands will be placed on pottery and forms will change accordingly. These changes may affect the actual form of individual vessels and/or the diversity of vessels in an assemblage. Given that we know the pottery-bearing sites in the Reed Collection span an interval of time, and anticipating a discussion in Chapter 11 that will suggest that diet and subsistence did indeed change in the interval during which pottery was used, we might examine vessel form as represented in the study area collections.

Of course, surface collected materials are not ideal for examining pottery vessel form. It is rare enough to encounter whole vessels and only somewhat more common to find reconstructible vessels in excavations (on the Central Plains, at least), but surface finds of whole or even reconstructible vessels simply do not happen. Rim sherds and some larger body sherds often do indicate probable vessel form, though, and it also is often possible to infer size from them as well. This is the case with at least some of the material in the Reed Collection. This summary of vessel form draws not only on the Reed Collection material, but also on work I have undertaken with vessel forms in the Central Plains

tradition, in particular, although I also have data for earlier (and later, but they are not relevant here) times.

Basic vessel forms that appear in the region through the pottery-using era commonly include jars and bowls, and may also include a few more specialized forms such as cups, bottles, plates, or beakers. Jars take a variety of forms (Figure 10.6). Common jar forms[4] represented in the Reed Collection include those vessels with:

- a minimally restricted neck and an upright elongated oval body (Figure 10.6a);
- a restricted neck, medium height rim that may be either direct or collared, horizontally elliptical body, and moderate shoulder (Figure 10.6b, c)
- a restricted neck, low rim, spherical body, frequent loop handles, and indistinct shoulder (due to the overall spherical body shape) (Figure 10.6d);
- a slightly restricted neck, rim that is high relative to overall vessel size, spherical to elliptical body, and angular shoulder (Figure 10.6e)

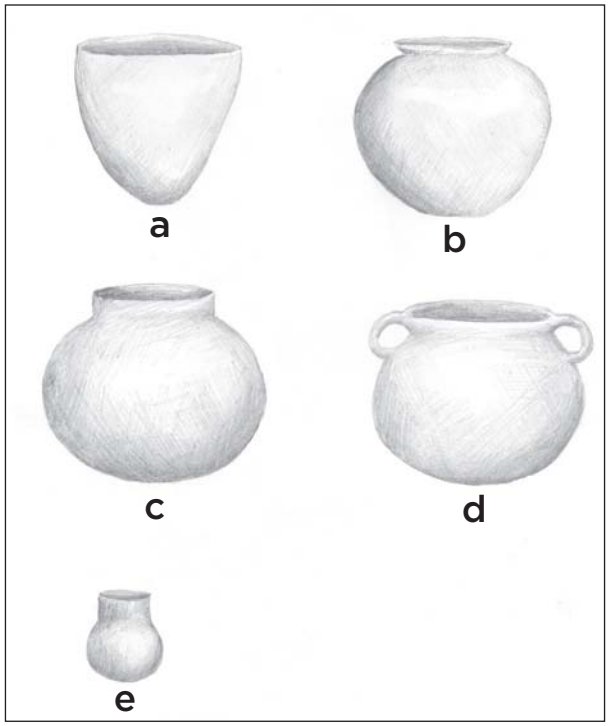


Figure 10.6. Vessel Forms

Analysis of a body of metric data indicates that several size classes can be recognized within some of these jar form classes.

The first jar form class is that for which I have the fewest data from all sources combined, but it appears that it may occur in several size classes, or at least over a size range. Without the complete body it cannot be stated with certainty, but it is likely that the vessel body is an elongated upright ovoid form, such as sketched in Figure 10.6a. It is most associated with Intermediate group sites and, in the Reed Collection, is identified in assemblages from 14SA433 and possibly also other sites from which the rim sherds simply are too fragmentary to allow vessel form to be identified. It also, however, occurs at 14SA408, which ostensibly is a late prehistoric site, and at other sites in northern McPherson County represented by surface collections curated at the KSHS at least some of which would also be called late prehistoric. It is fair to point out that this rim form could be associated with vessel bodies that take a different shape. This is pertinent because, as will be further discussed in Chapter 11, this rim form also occurs in 14MP407 and other sites in McPherson County, and also bear some resemblance to contemporaneous vessels in sites to the south in Oklahoma.

The second jar form class is the standard jar associated with Central Plains tradition sites (Figure 10.6b,c). It is ubiquitous in the sites described in Chapter 8 of this study, appearing in some number in most cases, and almost certainly accounting for the large majority of all vessels represented in the collections. My analysis of a considerable amount of metric data from complete or nearly complete vessels from sites throughout the Central Plains tradition indicates that these jars were made in several size classes. Direct rim vessels occur in size classes readily, if mundanely, characterized as small, medium, and large. Medium and large vessels were cooking vessels, but small vessels were not. Small vessels occur in mortuary context at the Whiteford site, but they also occur in lodge sites, so clearly they are not specifically mortuary vessels. Neither is it suitable to dismiss them as miniatures—in modern tableware sets, a tea cup is not a miniature soup tureen, but rather it is a valid class of vessels that are intended

4. Other jar classes are definable, but they are not represented at the sites considered in this book, at least so far as can be identified from the material in the collections.

to perform a different function. I suspect that these small jars functioned for presenting and consuming food, but not cooking it, and that they served that function in both lodge sites and the cemetery (Roper 2006a:194, 325). Collared rim vessels occur only in medium and large sizes. Like the medium and large direct rim vessels, these collared rim vessels were cooking pots. It is interesting to contemplate the possibility that the two forms (direct rim, collared rim) were used for slightly different cooking functions, possibly for cooking different foods. For example, fish dishes and meat dishes might be cooked in separate vessels, much as we know some North American tribes did in the past (e.g., Swanton 1942:174) and many modern cooks also do. Analysis of the composition of absorbed residues in a small sample of central Kansas/southwestern Nebraska sherds (none of them from this collection) does suggest different foods may have been cooked in differently shaped vessels (Cummings and Roper 2010) but as yet the sample size is too small to determine if this variation is consistent. Regardless of rim form, these vessels are always mineral-tempered in this study area. Decoration, when applied, is confined to the rim and/or lip.

The third form class listed above is usually a large jar (Figure 10.6d). It differs from the standard jars in not only the defining characteristics listed, but also in that it frequently is shell-tempered and, when decorated, as it often is, it is with a distinct motif that occurs on the shoulder, not the rim and/or lip as with the virtually all other decorated jars in this region. This form class is completely absent in collections from sites in Saline County, i.e., sites in the Smoky Hill and Saline river valleys, but occurs in relatively low percent in the assemblages from sites in Ottawa County, i.e., the lower Solomon River valley. The reason for the difference is at yet unclear. Time may be involved—i.e., the shell-tempered spherical jar may have appeared somewhat later than did the standard jar, but that is not yet confirmed and, in any event, may not be the only factor. Further comments on that topic are beyond the scope of this study (see Roper 2011a or Roper et al. 2010 for more).

The fourth jar class defined above is a form that I sometimes refer to as "those cruddy little pots" because they are quite small and were not well-made (Figure 10.6e). In manufacturing terms, they are pinch pots, not vessels built from straps of clay, as are the jars, so their exteriors are lumpy and their thicknesses are uneven. They do not appear to be deliberately tempered, and examination of the one thin-section I have ever had made from one of these vessels (from a site in southern Nebraska) bears that out. They certainly are not cooking vessels and they have a small enough orifice that it would be difficult to reach into them with the hand or any sort of implement to manipulate or extract the contents. They may have functioned to hold liquid foods or liquids such as water. These vessels often are not well represented in surface collections nor are they very well represented in curated collections from old excavations. They are not aesthetically pleasing, and they never are decorated. It is unlikely that they can be of much help in working out cultural chronologies, and they have no implications for taxonomy, so excavators in earlier decades probably largely ignored them and did not retain them in the collections. They are, however, abundant in collections resulting from more recent excavations where comprehensive recovery was used (e.g., Roper 1996) and probably were far more common than is realized in some of the sites excavated in earlier decades.

Another vessel form class pertinent to this study is what might generically be called bowls. In formal terms, they have a simple contour, meaning that their shape is that of a continuous curve that never recurves to create a distinct vessel neck. These vessels have an orifice, of course, and the upper vessel walls may restrict to that orifice, but the vessel has no distinct rim rising above the restriction. They sometimes are called coconut pots, after their resemblance to that fruit, but also are called seed bowls and the term holemouth jar occasionally appears in the literature. Across the ceramic inventories of the ceramic-era Central Plains, these vessels may or may not have an upper vessel wall restriction, but in the study area, all identified bowl forms do have one. The bodies of this bowl form on the Central Plains as a whole are overall nearly spherical with the upper vessel walls curving inward (sometimes called an inverted rim, although of course there is no distinct rim that is set apart from the vessel body) to the orifice. Data from a series of vessels in several repositories on the Central Plains that can be either directly measured or for which the diameter can be determined from a partial ves-

sel quite consistently show maximum diameters measuring around 15 cm. Orifice sizes have an inconsistent relation to overall vessel size, suggesting that directly accessing the contents might not be a priority for these vessels. They are not cooking vessels and may not be serving vessels of any kind either. They may have held liquids but would not be suitable for use in drinking. Context suggests that they may have been used for storage and transport of liquids such as oils. With one exception in the dataset I have, these vessels are mineral-tempered; the exception is the shell-tempered vessel from the Claussen site (Roper 2005b:90–98). They may be decorated but often were not. These vessels are identified from sites 14SA402 and 14SA406 in this study. Several also are present in the Whiteford site cemetery (Roper 2006a:179–183).

Trends in Pottery Thickness

Also having a bearing on pottery function and known elsewhere to reflect both the passage of time and the intensification of cultigen use is pottery thickness. David Braun first brought this to archaeologists' attention three decades ago in a well-known article "Pots as Tools" in which he showed changing mechanical demands on vessels were marked by changes in, among other things, vessel wall thickness (Braun 1983). Specifically, he showed that vessel walls thinned over time and interpreted this as a means to facilitate conducting the heat needed to break down the starch in cultigen seeds. His case study, which he further explored in several subsequent papers, was from Woodland-period Illinois, where vessel walls became thinner as cultigen use increased. This same trend has been shown in numerous other areas.

The data are on hand to see if this trend also is apparent in Central Plains assemblages and specifically in the CKRA. As will be discussed in Chapter 11, cultigens appeared regionally at the time of the Intermediate sites and increased in use in late prehistoric times. We do not know if crops were raised locally in the CKRA, and they actually may not have been. The vessel form changes already discussed in this chapter partially responded to this increased use of starchy seeds, so the question here is whether or not vessel wall thickness trends also did. Trends are evaluated with assemblages as a whole—individual particularly thin sherds in Intermediate group sites or thick sherds in late prehistoric context do not negate a trend. Instead, it is the central tendencies of groups of sherds that will reflect the trends. For the CKRA case, the numbers of sherds, which for this study will be body sherds, in late prehistoric context is reasonably adequate and indicative, but the numbers of sherds in Intermediate context are somewhat more tenuous. The analysis will proceed, but with the caution that while it is indicative, additional data would strengthen the results.

The data for this analysis are 16 sets of body sherd thicknesses, usually from individual sites but, in the case of some of the small Intermediate sites, several sites combined. Inasmuch as the age of the pottery from 14SA424 is unclear, the material from that site is shown individually, even though the number of sherds from this site is quite small. Data from sites 14SA432 and 14SA425 are combined inasmuch as these sites appear contemporaneous. The caution here is that if these are repeatedly used sites, portraying all material together may be averaging thicknesses from vessels deposited on the site at different points in time and thus may overlook a temporal trend. There is no alternative, however, given that individual occupations on these sites cannot be separated. Since site 14SA451 has a Snyders point and may be a bit earlier than the other small resource extraction camps, the data for it are shown individually even though that sherd count also is low. Sherd numbers from resource extraction sites are very low, so data from several camps with identifiable small corner-notched points are combined for this analysis. These include 14SA411, 14SA419, 14SA423, and 14SA433. Body sherd counts from each individual late prehistoric site are substantially higher than sherd counts from other contexts; accordingly, each site is considered individually. Body sherd thickness data from three additional late prehistoric site collections also are included in this analysis. These include the material from the KWU excavations at 14SA420; the collection from 14SA305, a site recorded by KSHS personnel in the course of highway investigations and from which a fairly substantial amount of material was recovered; and the collection from 14MP311, a site upstream from the Reed Collection study area, but included

Table 10.1
Summary Statistics for Sherd Thicknesses

Site(s)	n	range	Q1	median	Q3	x
14SA424	11	7.1–12.8	7.8	8.8	9.45	8.9
14SA432/425	64	5.2–10.7	7.15	7.55	8.4	7.7
14SA451	15	6.0–14.6	8.35	9.6	10.75	9.8
14SA411/419/423/433	16	5.3–12.1	6.55	7.2	7.35	7.7
14SA416	54	4.0–11.6	5.45	6.35	7.4	6.5
14SA403	21	4.1–12.2	5.5	7.3	8.8	7.3
14SA402	27	4.2–16.1	5.3	6.2	7.55	6.5
14SA407	12	4.9–9.1	5.8	6.3	7.1	6.5
14SA410	8	5.1–9.0	5.4	5.7	6.525	6.2
14SA406	69	3.6–10.8	6.0	7.1	8.1	7.0
14SA401	52	3.7–10.8	5.5	6.3	7.425	6.4
14SA408	83	5.0–13.0	6.65	7.7	8.55	7.8
14SA409	73	4.1–18.0	6.1	7.1	8.4	7.2
14SA305	102	3.2–10.7	4.7	5.8	7.15	6.0
14SA420	40	4.1–12.1	5.5	6.3	7.325	6.8
14SA403 (excavation)	41	4.1–12.2	5.1	6.3	8.1	6.8
14MP311	229	2.9–15.7	6.4	7.6	8.6	7.6
14MP423	22	4.1–16.0	6.625	7.05	7.7	7.6
14MP434	20	6.8–9.6	7.55	8.1	8.9	8.2
14MP456	97	4.8–15.6	6.6	7.5	8.3	7.6
14MP442	49	4.5–11.5	6.8	7.6	8.4	7.6

for reasons that will become clear shortly. In all three cases, all data analyzed here are those I collected during my examination of the collections.

The thickness data for the 16 sets of sherds, plus four others discussed later, are summarized in Table 10.1 and graphically potrayed using box-and-whisker plots in Figure 10.7. The ends of the box on a box-and-whisker plot are defined by the first and third quartiles of the list of individual measurements that are arranged in order of increasing value (thickness in this case). The line though the midsection of the box is the median. The median is the middle value in the list; quartiles are one-quarter of the way up the list and three-quarters of the way up the list or, another way to think of them is the middle value between the median and the lower (for first quartile) and upper (for third quartile) ends of the range of values (the median can also be thought of as the second quartile). The whiskers of the plot are either the length of one-and-a-half times the interquartile range, which is to say, the range of values between the two ends of the box, or the length of the range between the end of the box and the lowest or highest value in the dataset, whichever is lesser. The individual dots with some plots are outliers, which are data values beyond the ends of the whiskers as just defined. For this purpose, the median and other statistics are often better estimators of central tendencies than are averages, properly means, since the mean is susceptible to distortion from outliers, whereas the median and quartiles are not. Because summary statistics in other studies often report means rather than medians and do not always present all the data that allow a reader to calculate alternative statistics, means also were calculated and plotted, and the plot shown as an inset in the graph on Figure 10.7. In this particular case, means and medians are quite similar in most cases (Table 10.1), but some of the means are somewhat distorted by particularly thick sherds whose measurements show as outliers.

The data from the CKRA overall appear to reflect

a trend toward thinner vessel walls over a period of some centuries. In truth, we do not know the associations and age of the 14SA424 pottery, although late prehistoric seems unlikely. At the latest, the material would be attributable to Intermediate group manufacture, and late Paleoarchaic is not outside the realm of possibility. All median values for sites with Intermediate group diagnostic projectile points are thicker than those for most late prehistoric sites. The pottery from 14SA451 is the thickest overall. Since sherd numbers are small, this may be fortuitous; however, this plot is based on the measurements from all sherds with measurable complete thicknesses, just as are the plots from any other site. The thicknesses for the late prehistoric lodge sites are, for the most part, rather stable, at least in their central tendencies—the extremes, particularly the largest thickness values, are variable, but that overall is due to some unusually thick sherds in some of the collections. These could be sherds from vessel bases, which usually are thicker, or since the largest late prehistoric vessels are larger than the largest Intermediate vessels, the sherds could be from larger vessels (or the sherds could be from bases of larger vessels). Again, though, a few particularly thick sherds do not counter the message of the central tendencies.

The median and mean thicknesses of the material from 14SA408 are somewhat comparable to some of the Intermediate group sites pottery, and seem to form a notable exception to the generally thinner pottery on the late prehistoric lodge sites. To see if the 14SA408 thicknesses were just an anomalous case, I also included thickness data for the body sherds in the KSHS collection from 14MP311, which lies upstream from 14SA408 and also appears to be a late prehistoric site. The pottery from this site exhibits the same general fabric as does 14SA408, and some rim sherds also bear some resemblance to those from 14SA408 and Intermediate group sites. The plot shows that, as an aggregate, the 14MP311 sherds also are thicker than the aggregates of sherds from most late prehistoric sites and are similar in thickness to the body sherds from 14SA408.

Given this, it seemed worth spending a few hours one afternoon at the KSHS looking at the pottery from additional McPherson County sites. These are sites that, as with the sites included in this thickness analysis, have collections containing body sherds, and hopefully also rim sherds, and that have some other diagnostic artifact, particularly projectile points, that would be independent evidence for broad temporal placement. Eight sites were found to be suitable, but four of them had too few body sherds for meaningful analysis. The four suitable collections included those from 14MP423, 14MP434, 14MP442, and 14MP456, each of which could be fairly confidently identified as late prehistoric, and each of which had sherd sample sizes at least comparable to those from the Saline County sites. Helpfully, three of the four also contain rim sherds. Each of these four sites is adjacent to the Smoky Hill River. Two of them, 14MP442 and 14MP456, are within two miles of 14MP407, investigated by the Kansas Archeology Training Program (KATP) in 2004 (Bevitt 2006). The body sherds in the collections from each of these sites also reflect the fabric type associated with 14SA408 and 14MP407. The assemblage from 14MP407 also would provide for a good comparison, but while I have data for the rim sherds, I have not measured body sherd thicknesses and time simply did not permit doing that in the course of completing this study. The large number of sherds probably would have made for a somewhat unfair comparison anyway.

The final four lines in Table 10.1 and Figure 10.7 add the summary statistics and the box-and-whisker plots for the four McPherson County sites to those from the other 16 sets of sherds. The simple observation is that thicknesses of body sherds in this locality are stable and are reasonably similar to one another and to the body sherds from 14SA408 and 14MP311. The offset of 14SA408 pottery relative to that of other late prehistoric sites in Saline County is once again apparent.

The measurement of time used here is coarse, and most samples sizes are not particularly large. Nevertheless, the results are indicative, and, as in other places in the interval when cultigen use is being intensified and pottery vessels are being called upon for increasingly intense boiling of the starchy seeds that are the foundation of the eastern agricultural complex, the wall thicknesses of pottery vessels used and discarded in the CKRA appear to have decreased over time. This is not to suggest that the vessel changes confirm the intensification of agriculture, for that is independently well-established directly from paleoethnobotanical evidence (Adair

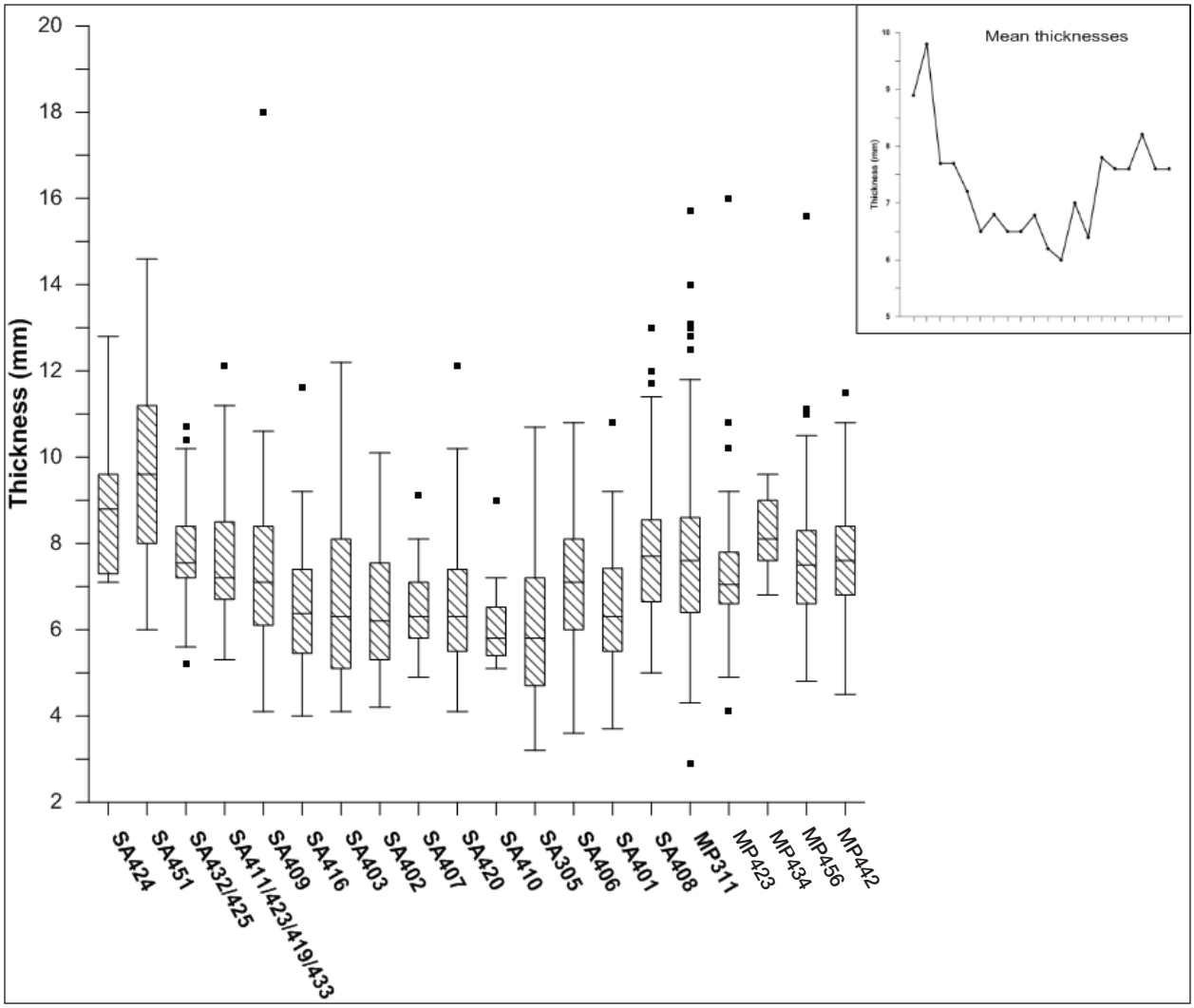


Figure 10.7. Sherd Thicknesses for 20 Sites in Saline and McPherson Counties

2003). Instead, it takes that result as a given and, with vessel form change data, indicates that, as I have suggested elsewhere (Roper 2007c:55–56), pottery vessels were being re-designed to incorporate new performance characteristics as agriculture was intensified. This becomes pertinent as we seek to understand how the material culture changes that constitute the archaeological record of the study area came about. The differences in overall thicknesses between the bulk of the Saline County sites and the Lindsborg locality sites (McPherson County sites and 14SA408) may also be pertinent, and, it will be remembered, fabric and vessel form also was distinctive. This is further discussed in Chapter 11.

Decorative Style and Its Distribution[5]

Addressing the decorative style reflected on the numerous rim sherds in the Reed Collection seemingly brings us to a more familiar and more

5. The earlier pages of this section are modified from, but largely follow, a portion of a paper presented at the 2007 Flint Hills Conference (Roper 2007a). Reviewing that paper in the course of preparing this chapter suggested this otherwise unpublished paper had constructed a wheel that did not need reinventing. I note that in spite of dispensing with phase names in this study, for reasons already given, it is necessary to use them in at least this review of how pottery has been handled in the past, for, in fact, the pottery has been evaluated for phases and the typology for the Smoky Hill phase is the typology for that phase, as that term is commonly used.

traditional aspect of pottery analysis in the region. My study of this material, however, does not follow the familiar and traditional model, but instead addresses pottery style with a different set of theoretical understandings and analysis methods. To explain why, the actual analysis is preceded by an admittedly somewhat lengthy prelude that shows how this analysis furthers rather than simply reinforces our understanding of an aspect of past life in the study area.

The pottery descriptions and analyses in previous chapters of this study did not employ the conventional pottery typology for the Central Plains. Certainly, typology has underlain the study of Central Plains tradition ceramics for some time and type identifications are routinely used to account for the contents of collections. The operational basis for ceramic typologies in the region was established in the 1940s when Plains archaeologists identified the need for a consistent set of types that would facilitate systematic comparisons across space and permit an appreciation of the relative temporal position of sites and recognized cultural complexes. Participants in the 1947 Plains Conference therefore agreed that formal pottery types should be defined following the format developed by the Southeastern Archaeological Conference (SEAC) (Jennings 1949:42). The SEAC format had been published in 1938 under the names of James Ford and James Griffin, and it set out criteria for constructing and naming pottery types. To avoid the problem of types potentially being defined on the basis of different and non-comparable criteria, the SEAC analysts decided to use surface treatment and decoration to define types (Ford and Griffin 1938:12). They developed a list of what they called constants and, as needed and applicable, modifiers, and developed their types using these specific criteria. A name for a type developed in this manner would have three parts: a geographic name, the name of one of the modifiers, if there was one, and the name of a constant. Examples might be type names like Lamar Complicated Stamped or Fatherland Incised—incised and stamped are constants, complicated is a modifier to stamped, incised has no modifier, and Lamar and Fatherland are the geographic names. Types then would be described according to a suggested outline. The outline allowed for describing many more characteristics of the pottery than just surface finish and decoration, but it is important to recognize that these other characteristics are *not* criteria used in actually defining the type. Note also that the way decoration is used in type formation is limited to basic decorative technique—i.e., how it was applied, be that incising, stamping, punctating, or other—and not motif, complexity of decoration, or placement of decoration.

Plains archaeologists soon proceeded to develop ceramic types using these adopted principles. For the Central Plains material, they substituted rim form—generally collared or direct—for surface treatment, following a practice that William Duncan Strong (1935) had been using since the early 1930s. Decoration, however, was used in the same way it was in the Southeast, i.e., primarily according to decorative technique, such as incising or some similar technique of tool-decoration, pinching, or cord-impression (not to be confused with cord-roughening as a surface treatment). Naming conventions would follow the precedent set in the Southeast. Thus, for example, the types J.S. Sigstad (1969) defined for the pottery from the Upper Republican phase Mowry Bluff site in the Medicine Creek valley of southwest Nebraska were named as shown in Figure 10.8, using the county name (Frontier) and the name of the largest town in the valley (Cambridge), along with the name of the decorative technique (plain, meaning undecorated, being, in effect, a decorative technique) as the constant.

James Gunnerson's 1952 ceramic typology for the Nebraska phase was the first published typology to apply these principles to a Central Plains tradition taxon (Gunnerson 1952). Similarly constructed typologies have followed for other parts of the Central Plains tradition (Anderson 1961; Hedden 1992, 1994; Ives 1955; Sigstad 1969). Pertinent to this study is Hedden's (1992, 1994) pottery typology for the Smoky Hill phase. Waldo Wedel (1959:183–184) had previously defined Riley Cord-roughened pottery using materials from one of the Smoky Hill phase type sites (Griffing, 14RY21, in Manhattan, which is in Riley County), and saw the applicability of this type to the material from other sites (Wedel 1959:563–564). In a real sense, though, Wedel did not formulate this type according to the type formation rules Plains archaeologists had agreed upon (my suspicion is that he had defined it before that agreement came about)—in fact, he referred to it as

Rim form	Decorated	Undecorated
Direct	Cambridge tool–impressed	Cambridge plain
Collared	Frontier incised	Frontier plain

Figure 10.8. Representation of Sigstad's Upper Republican Pottery Typology

a ware, rather than a type (ware is a more generalized, sometimes nebulously used, concept than type and is based on different criteria). Hedden used the principles agreed upon for typology of Plains pottery to develop true types within this ware. Thus, he used rim form, distinguishing between collared and direct rims, and primary decorative technique, recognizing pinching and tool-impressing, a general term that included both punctating and incising, as the predominant means of decorating a vessel. The result was six types of Riley Cord-roughened pottery, shown schematically in Figure 10.9 and named according to the adopted naming convention. This typology closely resembles Sigstad's (1969) Upper Republican phase typology, differing from it only in that pinching is at best very rare in Upper Republican phase site collections and thus is not accommodated by that typology, but it is well-represented in Smoky Hill phase site collections, and prominent in the collections Hedden studied, so did need to be added. Nebraska phase pottery typologies also are similarly constructed, although they have more variety to accommodate.

The goals of pottery typology in the 1940s and into the 1950s (and to an extent beyond), on the Central Plains and elsewhere, were fairly simple. The ruling paradigm in American archaeology was culture history. Using principles of the Midwestern

Rim form	Decorated		Undecorated
	Pinched	Tool-impressed	
Direct	Riley flared pinched	Riley flared tool-impressed	Riley flared plain
Collared	Riley collared pinched	Riley collared tool-impressed	Riley collared plain

Figure 10.9. Representation of Hedden's Smoky Hill Phase Pottery Typology

Taxonomic Method (see Chapter 4 of this study for a brief review of this method) in the East and on the Plains, the idea was to develop types of culture based on content alone, and to place them in time and space. Ford and Griffin (1938:12) had said that pottery types should be useful for interpreting culture history. As they put it, pottery was a "reflector of cultural influence" and a "tool for demonstrating temporal and areal differences and similarities." The history of archaeology in the Southeast, in particular, at that time shows how crucial a role pottery played in mapping the spatial extent of cultures and building chronological sequences. Archaeologists on the Central Plains used pottery similarly. Thus, to the extent we can identify any sort of a theory of ceramic style at that time, style was seen as operating at a general level to identify broad cultures and to mark the passage of large chunks of time. This, however, was the limit of the capabilities of types.

Even as Central Plains archaeologists were beginning to define types using uniform procedures, the Southeast and other parts of North America were moving on. Most pertinent to this discussion is the development of type-variety systems. Joe Ben Wheat, James C. Gifford, and William Wasley introduced this approach to pottery analysis in the Southwest in 1958 (Wheat et al. 1958) and Philip Phillips (1958) quickly proposed its application to eastern, particularly Southeastern, ceramics. Gifford (1960:341) soon thereafter discussed the "theoretical reasoning" underlying the type-variety method. Perhaps the critical sentence in that discussion is the one where Gifford said that "[W]ithin the context of the type-variety concept, variation as a recognizable reality can be thought of as the product of the individual or of relatively small social groups in human society." This last, he continued, could encompass "potters in a village segment, a village, a group of small villages, a community, or a series of communities at a maximum." Types, then, "generally include several or many varieties, and as a result are summations of individual and small social group variation" (Gifford 1960:342). Several Southeastern studies are considered classics in this regard, including Phillips's study of sites in the Yazoo basin of Mississippi (Phillips 1970), and Vincas Steponaitis's (1983) type-variety system for the Moundville (Alabama) pottery. The type-variety system also was quickly adopted in the Maya area of Mesoamerica (Smith et al. 1960) and remains strong and sometimes staunchly defended in that region to this day (Aimers 2013). Archaeologists working with Central Plains tradition material (or material from anywhere on the Plains), however, never developed a type-variety system for their material.

Central Plains archaeologists also never developed an alternative approach to using pottery for purposes beyond identifying sites to broadly defined phases and broad intervals of time. A major consequence is that, by implying a unity to the phenomena within a phase, we continue to treat a phase as having a social reality that it does not have and that we continue to regard the broad temporal parameters for a phase as equally applicable throughout the area of that phase when detailed chronological analysis shows they are not (Roper 2014). This means, then, that we are continuing to hold a very static view of culture change and to regard phases as equivalent to the tribes of the protohistoric and historic period. It also means that we are imposing these views on the record rather than interrogating the record to see if that really is the best way to account for the specifics.

The Reed Collection pottery, however, holds two great lessons that run counter to this *status quo.* One is that we do not know area culture-history as well as we think we do. The other is that late prehistoric society was not organized in the manner of the later tribes. This is a lesson we know from far more than the study of this one collection, but for which notable improvements have not been forthcoming. The specific observations teaching us these lessons with this and other collections are that: 1) the distinction between "Woodland" pottery and "Central Plains tradition/Smoky Hill phase" pottery is artificial and misleading (in other words, at times it is impossible to make reliably), and 2) that the stylistic variation in what we perceive as Riley Cord-roughened pottery, i.e., Smoky Hill phase pottery, is not random and instead reflects a social organization on the Central Plains in the early part of the second millennium that has no historic analog.

Going through site forms for pottery-era sites in this general area of central Kansas shows that a fair number of them list, under cultural affiliation, both "Early Ceramic" (Woodland) and "Middle Ceramic" (Smoky Hill phase). Site descriptions in earlier chapters of this book also show that Harold

Reed sometimes mused over the assignment of sites to the Woodland or to the Smoky Hill phase (possibly phrased as Early Ceramic or Middle Ceramic). As I began to work with these collections, particularly those from many of the sites described in Chapter 7, I too began to realize just how subtle and probably artificial a distinction between the Harlan Cord-roughened pottery of the Woodland tradition and the Riley Cord-roughened pottery of the Smoky Hill phase could be. Some reflection showed the ultimate source of the problem.

A review of the history of Central Plains archaeology reveals that archaeologists in the mid-twentieth century proceeded by naming cultures first and defining pottery types within each culture individually. This accounts for the artificiality of these types, and it was a distinct contrast with, for example, the lower Mississippi River valley. Here, in a classic study, Philip Phillips, James Ford, and James Griffin (1951) developed pottery types for the region by first making collections from an extensive series of sites in their study area and cataloging and labeling them, but then putting all the pottery onto a table in, as they put it, "one terrifying heap," and proceeding to work out types by sorting the sherds into satisfactory groups without regard to provenience. They then named types and wrote out formal descriptions for these types. Only *after* doing all this did they tabulate the sherds, by type, from the individual sites, and only *after* also plotting types stratigraphically within test excavations and performing seriations, did they define a chronology (Phillips et al. 1951). The life-history of a type was that it was introduced, increased in proportion in assemblages, decreased in proportion, and was discontinued, each type doing this on, in effect, its own schedule. Types cut across periods and cultures and may have been produced over greater or lesser intervals of time.

These two ways of developing ceramic typologies obviously are diametrically opposed to one another. Each also is underlain by sharply contrasting conceptions of culture-history and culture change. In the lower Mississippi valley, the underlying conception is that of broad continuity and a continuous stream of culture. On the Central Plains, as has been remarked elsewhere in this book, the underlying conception is that of a series of discontinuities, of repeated immigrations and emigrations of distinct peoples whose material culture complex was largely invariant during their residence on the Central Plains. This latter has cut both ways. It has led to the creation of separate pottery typologies for each culture, but also, by virtue of continued use, has continually reinforced the perception of discontinuities. But what happens if we ignore type names and associations with other ostensibly diagnostic artifact classes and proceed in a manner similar to that of Phillips, Ford, and Griffin? My answer is that the types come out very differently, and that we find a single undecorated type (perhaps with an uncommon decorated companion) that is cord-roughed to the lip crossing the entirely arbitrary temporal boundary between the "Early Ceramic" and "Middle Ceramic" periods (and persisting into "Late Ceramic" too, although that is not pertinent here). I think that this is why it is so difficult and unreliable to assign some sites to one or the other of these periods or to the cultural complexes associated with them. This single pottery type may thin over time, lip treatment may subtly vary, temper may vary some, and vessel form (which does *not* enter the type definition; types are sherd types, not vessel types) may also vary, but the pottery type really does not substantially vary overall. Typological diversity, however, increased as pottery played a more prominent and more diverse role in food preparation technology and as its social functions also increased. This is materialized as greater diversity in rim form, and an increasing incidence and greater diversity of decoration.

The very fact that a typology built according to the agreed-upon principles of type formation for the Plains could result in the definition of six types within the Smoky Hill phase is a clear indication that there is observable variation at some level. But it takes little observation of the actual pottery collections, or even well-illustrated published reports of those collections, to realize that late prehistoric Central Plains pottery shows a considerable amount of decorative variety within each type. The use of types as they are defined implicitly says that this variety is meaningless, that it is noise, that it may be just a result of a potter's whims when she decorated a vessel, and that it is of no use to the archaeologist. In the last few decades, however, archaeology has developed the theoretical position that pottery style reflects social group identity, and that this observed

variety is of great use to the archaeologist. The developers of the type-variety system had anticipated this when Gifford commented that varieties, formed within types, would monitor individual or small group identity, but at the time, the theoretical backing for such a statement was lacking. Now, however, the theoretical backing is in place that will permit us to use pottery style, considered at a detailed level, to address and study social organization in late prehistoric societies. In this context, pottery is studied not simply for its own sake or to describe it, as we assume we must do if it is in a collection being reported, but rather pottery is studied as a means of addressing larger and more important questions about the past. In this case, those larger questions relate to social organization.

The approach taken here to using pottery to evaluate social organization is to study the geographic distribution of style variation. This is an approach that is not without precedent in archaeology, and specifically in pottery studies from other areas (e.g., Sampson 1988; Shennan 1978) and even from the Central Plains in a remarkable and sadly neglected study from a century ago (Sterns 1915; see Roper 2008d for a commentary on Sterns' study). The basic tenets of this approach, at least as I use it, are that members of a sedentary self-identified community may not live in a nucleated community, or village, but do live in reasonable proximity to one another and do interact regularly, forming a community of identity; that pottery style is a marker of that social identity and community; and, accordingly, that pottery style will show less variation within a community than among communities, even if those communities interact with one another at a more general level.[6]

As this study proceeded, I also undertook a study of the geographic distribution of ceramic style over the entire Smoky Hill phase. It made eminent sense to augment that study with data from the Reed Collection materials, and, in any event, these materials needed analysis for this book, and it would have been rather silly to analyze them in a different manner. The larger study keys on excavated collections, including some in the CKRA, but use of the surface collections also provides a greater density of coverage for one part of the larger study area. In my study of the Whiteford site cemetery, I proposed that it was a feature of a late prehistoric community, but while it was easy to tie together the materials from the excavations at nearby lodge sites 14SA414, 14SA403, and 14SA415 and compare them with the pottery from the cemetery to make this argument (a body of evidence I summarized but actually did not detail in that book, although a paper presented a few months after it appeared does contain more detail [Roper 2007a]), evidence allowing us to infer the extent of this community was lacking. The Reed Collection, with its rim sherds from sites spread over a larger area now does allow that question to be addressed. That is the primary question considered here.

This analysis works with as many rim sherds as possible. Some sherds simply are too fragmentary to permit most observations to be made. These contribute nothing to the analysis and are eliminated. Sherds with partial information are retained for what they can contribute. A total of 534 rim sherds are considered. They include all usable rim sherds in the Reed Collection, except for those from the Minneapolis site, since that voluminous collection accounts for over one-third of all rim sherds and would swamp all other data, as well as the excavation collections from 14SA403, 14SA414, 14SA415, 14SA420, 14OT305, 14OT308, and 14LC301, in addition to the KSHS surface collections from 14SA305, 14OT317 (which really is a continuation of 14OT305), and 14MP311. The analysis is limited to rim sherds from jars only, a filtering that excludes only a few rims. It would be desirable to separate the Lindsborg locality rims from those from the Salina locality, but in actuality, there are so few of them that that is not practical and, for now, they are with the Salina locality rims.

The analysis considers both decoration and rim form, with decoration the principal medium through which potters expressed social group identity, and rim form the canvas on which that identity is inscribed. Potters inscribed messages somewhat differently on rims in differing classes. Rim classes in this dataset include direct rim, collared rim, S-rim, wedge rim, and the single T-shaped rim in the collection.

6. This last is essentially a cultural expression of what in compositional studies is referred to as the provenience postulate, viz., that there will be less variation within a population than between populations.

The real work of identifying communities is accomplished by examining decoration in some detail. To do this, I break down decoration into six zones on a vessel. Rim zone 1 lies immediately below the lip. It might exhibit pinches or nodes, or it might show an incised line bounding the top of main motif. Rim zone 2 occupies a large part of the middle of the rim and contains the main motif. In principle, this motif can show considerable variety. In practice, the number of identified main motifs in any locality is limited. They may, or may not, however, be combined with additional decorative elements in rim zones 1 and 3, thus increasing the variety of rim decorations within a locality. Rim zone 3 lies in a position low on the rim, near or at the base of a collared rim, or not far above the neck on a direct rim. It might be an incised zoning line bounding the bottom of the main motif, or it might be a row of pinches or nodes, usually applied at the base of a rim collar. Rim zones 1 and 3 may also lack decoration. My earlier studies of the variation in late prehistoric pottery on the Central Plains indicate that it is not only the main motif but also the presence or absence of zoning lines in rim zones 1 and 3 and/or of pinches/nodes particularly in rim zone 3, plays a role in defining local styles. The vessel neck constitutes zone 4. The fifth possible zone of decoration is a vessel shoulder. Decoration in this zone does not occur in the Saline County sites and it appears only occasionally in the Ottawa County sites. The rest of the body, or the belly, of a vessel in principle is a sixth zone of decoration, but with the exception of one quite strange pot in the Whiteford site (Roper 2006a:187–189), no vessel belly from a CKRA site is decorated.

The analysis looks first at the incidence, i.e., presence-absence, and complexity, i.e., number of zones, of decoration. These are simultaneously accomplished by simply counting the number of decorated zones on each rim to produce a complexity score, with zero indicating an undecorated rim. Rims are assigned to one of three geographic groups, literally, the Smoky Hill, Saline, and Solomon River valleys. The distribution of complexity scores within these geographic groups is shown in Figure 10.10. Undecorated, or plain, rims are shown to be the major decorative style in all areas, with 79.9% of the pottery from Smoky Hill River valley sites, 89.8% of that from Saline River valley sites, and 69.9% of

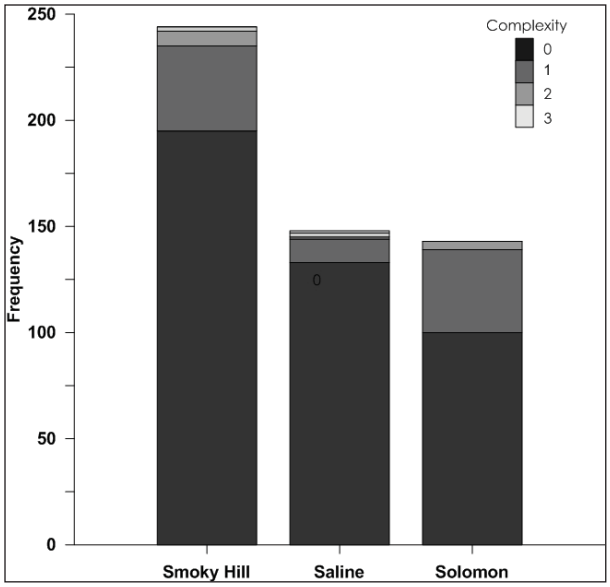


Figure 10.10. Pottery Design Complexity by Drainage

that from Solomon River valley sites undecorated. The numbers for the Saline River valley are slightly misleading. Only two sites listed as attributable to the Smoky Hill phase are known in that valley (confirmed by a site file search for additional sites) but pottery is noticeably different between the two sites, with 81.7% undecorated pottery in the 14SA409 collection and 97.4% undecorated pottery in the excavated (Witty 1962) collection from 14LC301. Overall, then, undecorated rims are predominant throughout the study area but proportionally somewhat less so on sites in the Solomon River valley than on sites in the Smoky Hill River/lower end of the Saline River valleys. When rims are decorated throughout the area, decoration is not complex, exceeding one rim zone in only a small percentage of cases: 3.7% in the Smoky Hill River valley, 2.7% in the Salina River valley, although 5.8% at 14SA409 alone, and 2.8% in the Solomon River valley.

Further analysis looks at the nature of the decoration. This must be done within rim form classes. Figure 10.11 shows this distribution. Decoration on direct rims is predominantly placed on the lip but in just over 15% (not quite one-sixth) of cases appears on the rim. Decoration on collared rims follows an opposite trend, with decoration appearing predominantly on the rim or both lip and rim, and not often on the lip alone. Although caution must be exercised with the very small number, the trend is similar for S-rims and that is not a surprise since,

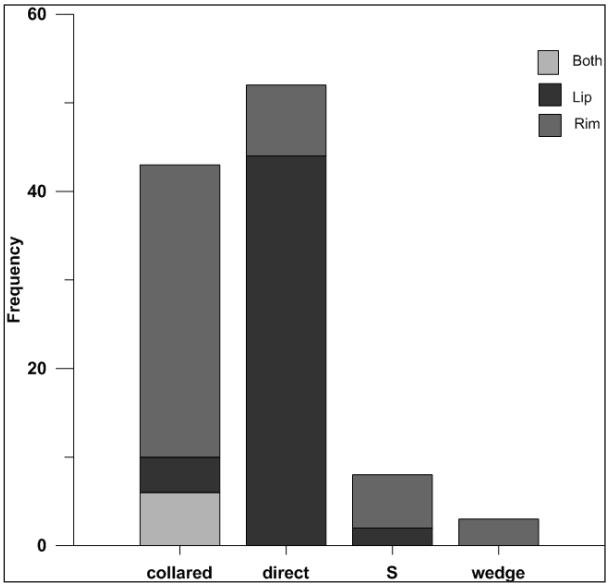


Figure 10.11. Design Placement by Rim Form

externally, S-rims look like collared rims. Wedge lips, for which the numbers are even smaller, also look like (but are formed differently than) collared rims with very short collars and also exhibit decoration only on the rim and never the lip. Numbers are small for evaluating these distributions within geographic groups but inspection of raw numbers indicate that 5 of 8 instances of rim decoration on a direct rim vessel are from sites in the Solomon River valley, and that 4 of 6 instances of decoration on both the lip and rim of a collared rim vessel also are in the Solomon River valley.

Going into further detail, and working within geographic areas, we start with the Smoky Hill River valley sites, the geographic area containing the Whiteford site and the excavated sites shown to be associated with it. In the few instances of decoration on direct rim vessels, decoration is punctates or incisions on the lip. The collection from 14SA420 (excavated) is the major exception to this, and even then the exception is that a greater proportion of lips are decorated than is apparent on the other sites (including the excavated sites). Decoration on the rim panel is limited to a single instance, also from 14SA420. Collared rim vessels are somewhat more often decorated. No collared or S-rim from any site in this geographic area exhibits lip decoration. The most common decoration on these rim sherds is a series of parallel incised lines encircling the rim. This motif was placed in rim zone 2 and only occasionally is accompanied by pinching or punctating either above or below it in rim zone 1 or 3. Zoning lines in rim zones 1 or 3 tend to occur more on S-rims than on collared rims. Other incised motifs may be substituted, but they are limited to oblique lines or to the rare cross-hatch or zig-zag. Pinching as a sole motif and placed in either rim zone 1 or 3 is very uncommon.

Two sets of exceptions to this area are noted. One set is the rims from what are inferred on the basis of other diagnostic artifacts to be earlier sites ("Woodland") sites. These are exclusively direct rim vessels and only one instance of decoration, that being lip decoration, is noted. The other set of rim sherds we might highlight are the sites, including 14SA408, 14MP311, and other McPherson County sites listed earlier that lay farther upstream. A few collared rims appear in these collections; otherwise, rims are accurately described as direct but with a long and gradual neck that is minimally constricted. As we have already seen, the fabric of these sherds is distinct, and sherds overall are thicker than those from sites downstream from (north of) the Bridgeport area. Decoration is not completely lacking on these rims, but in the material available for this study, it is confined to 14MP311. There, it follows the same principles as other Smoky Hill River valley sites.

Decoration on rims from sites in the Saline River valley have to be individually summarized for 14LC301 and 14SA409. The 14LC301 collections contain both collared and direct rims, although the latter are more than twice as abundant as the former (21 collared and 57 direct). As we have seen, however, only two rims in this collection are decorated. Each of these is a direct rim with incised decoration on the lip. The collection from 14SA409 forms a distinct contrast. Collared and direct rims occur in almost equal numbers (31 collared, 28 direct) and the collection also has nine S-rims, which is a number considerably larger than any other site collection in this analysis. Only one direct rim vessel has lip decoration, and one other has a simple motif on its rim panel. The collared rims, however, are more elaborately decorated. Eight of 31 collared rims and 3 of 9 S-rims, about one-quarter and one-third of

the totals, respectively, are decorated. Decoration is usually an incised motif that may be accompanied by zone lines or punctates/incisions in rim zone 1 or 3, particularly on the S-rims.

Decoration on Solomon River valley sites contrasts with the other geographic localities within the CKRA. As in the other areas, lip decoration is more frequent on direct rims than on collared rims. Rim exterior decoration usually is confined to one rim zone only. Rarely is this rim zone 2. Decoration, therefore, is normally placed in rim zone 1 or 3 and overwhelmingly was produced by pinching. This is true of both direct rims and collared rims.

Summarizing this, it is clear that the pottery styles of the Minneapolis area and the Salina area are distinct from one another. I infer that these style zones reflect separate self-identified communities in these two parts of the CKRA. The Minneapolis area community is asonably discrete and confined to that area. It also, as we will see in Chapter 11, was quite short-lived. The Salina area sites, however, probably were organized into more than one community. My interpretation of these results—and, of course, I do also have the subjective impressions from having handled and observed every rim sherd upon which the analysis is based—is that the community associated with the Whiteford site cemetery and the nearby lodges extends upstream on the Smoky Hill River no farther than the vicinity of site 14SA412. It may not include 14SA409 and does not include 14LC301 on the Saline River. Upstream from around the Bridgeport area on the Smoky Hill River, and including both 14SA427 and 14SA408 in this collection, as well as sites upstream in northern McPherson County, was another stylistic collective. My impression is that this actually was not so much a separate contemporaneous community as it was an earlier set of sites that possibly begins to, but does not strongly, express the characteristics so classically represented in the community downstream in modern Saline County. This also is further considered in Chapter 11.

CHAPTER 11

Occupation History of the Central Kansas Riverine Area

The last part of Chapter 4 anticipated the synthesis to this study by presenting an alternative to the traditional culture-history framework for central Kansas. As indicated there, in a real sense, it was a conclusion to the study, drawn after many hundreds of hours of studying the collections and occasionally consulting other collections, and considering the implications of all the observations. It was necessary to present it upfront since, in the end, it became the basis for arranging the description chapters (Chapters 6–9). It also set forth some of the terminology that would be used and explained why certain other terminology would not be used. It outlined, but did not fill out, the characteristics of the various groups of sites, reserving that for these concluding chapters.

This chapter now brings together a refined history of human occupation in what is one of the more comprehensively-studied parts of Kansas. It is not simply a filled-out accounting for the characteristics of three main groups of sites but is, or at least strives to be, a more dynamic account that ignores these group boundaries (intentionally fuzzy to begin with) and, to the extent it can, downplays the designations of site groups. It focuses not on things, but on people as knowledgeable actors who interact with the landscape and, as circumstances warrant, with other peoples to produce their history. To be sure, the narrative is constructed by studying the material record and making inferences about past human behavior. It does this by drawing not on stereotyped statements, inappropriate analogies, or made-up stories about the past, but by using well-established principles and archaeological theory to read the evidence at hand. It cannot be better than the evidence on which it is based, and it certainly will be uneven in how broad an understanding we can have regarding past actions in the area. I will assert, though, that this is no limitation but rather a reminder of how much work we have yet to do to better understand the human past in the study area. I believe, though, that it shows how far we have come by being able to study and learn from bodies of evidence such as that from this collection.

Throughout this narrative, the effort is made to, as much as possible, substitute a timeline for a succession of stacked taxonomic units or "cultures." Indeed, this is essential to the narrative. The distinction between a timeline and a chronology, as discussed by Ann Ramenofsky (1998) or Robert Dunnell (2008) is that a taxonomic sequence is simply a relative ordering of cultural units with possibly varying length—an ordinal scaling—whereas a timeline is based on an interval scale of calendar dates against which past events are arrayed. For example, and using conventional terminology, the Archaic period covers about 6000 years, whereas the time of the Late Prehistoric sites locally is not much more than a century, if that. Further, unlike stacked taxonomic units, which are built from the very phenomena we are wanting to place in time, timelines are constructed from evidence that is external to the phenomena being studied and are independent of the specifics at any place. This makes it possible to not only better appreciate how much time is involved but also to compare sequences in various places. For example, the "Measuring the Past: A Timeline of Kansas Archaeology" brochure produced by PAK compares the sequence in Kansas to the time of such prominent world events as the construction of the Great Wall of China, the invention of writing in Mesopotamia, or the fall of the Roman Empire. Of course the timeline for the CKRA is imperfect and approximation is necessary in many parts of it, but this should not keep us from approaching the phenomena this way. Robert Dunnell was right when he said that with the ability to obtain accurate and rather precise radiocarbon dates, "the phase should be out of work" (Dunnell 2008:64). I have tried to put it out of work in this account. In the absence of radiocarbon dates from this area, though, it has been necessary to use cross-dates from diagnostic

artifacts for part of this sequence; however, the emphasis is on date ranges that need not correspond to an entire period or even that cross-cut some units as they are currently used by others. Radiocarbon dating the specific phenomena in the CKRA would alleviate this necessity and would be worthwhile, although it would be difficult to find appropriate samples and would need to be done carefully and thoughtfully.

Finally, although I presume readers will be aware of the amount of time represented by the human occupation of the study area, it is possible that some will not. To help with perceptions and in keeping with the use of a timeline as a chronological device, Figure 11.1 is a representation of a calendar time scale and how the sites described here fall (sometimes roughly) along that scale. Some of this is based on cross-dating from diagnostic artifacts. It is no better than the dating of the artifact classes elsewhere, and represents only a first approximation, subject to further research, but is all that currently is available. Happily, some of the latter part, and the best-represented part, of the history is based on a reasonably good set of radiocarbon dates and the newest analysis of those dates. Each part of the narrative will explain the basis for the assigned dates. Radiocarbon ages are calibrated to calendar dates using current calibration curves.

Paleoarchaic through the Altithermal

So sparse is the Paleoarchaic record for central Kansas that Blackmar and Hofman's (2006:49) table of "Recognized Paleoarchaic Complexes in Kansas" lists none whose area distribution (their term) includes the CKRA. We saw in Chapter 6, however, that the Reed Collection does contain a very limited record of Paleoarchaic use of the area. Two kinds of evidence are available, in principle. The primary and most obvious is sites that appear to be single-component sites attributable to occupation by people during the early millennia of the areal cultural sequence. The second is the occasional isolated Paleoarchaic projectile point in collections from late prehistoric sites, where there are no other indications of early occupation. Although such instances are limited in this set of site collections, the presence of older points in late prehistoric assemblages actually is rather common in late prehistoric sites in localities to the west of this study area (Grange 1980:160; Kivett and Metcalf 1997:107–108; Klippel 1969:25, 33; Roper 1996:117–119, n.d.). Late prehistoric people fairly intensively used the landscape surrounding their farmsteads, and we know that those landscapes held sites of earlier peoples. It is apparent that late prehistoric people occasionally collected these earlier materials. Refurbishing tools collected from these sites is one possible reason for doing so, particularly in an area such as this where chert does not occur in primary context. Arguably, the tools and lithic debris left by predecessors become the closest thing to a local raw material source. The fallacy, of course, is that an older isolated tool that is identifiable as such probably shows no refurbishing that could be unambiguously attributed to later people. Perhaps it is one they never actually got around to reworking, and there are others we do not recognize as reused; perhaps they collected an old point as a curio; perhaps it was viewed as a link to ancestors—it really is beyond our ability to understand why old points appear in later context. Regardless, these isolated points constitute a secondary source of information about early occupations in the study area. Given the sparseness of primary source information, it is useful to have this secondary source. In fact, in this study, such pieces account for about half of the objects identifiable to the earliest eight or so millennia of human occupation in the area.

With one possible exception, Paleoindian remains are absent from the collections. The exception, to which the label *possible* definitely must be affixed, is from a secondary context and is a single point fragment from 14SA424 (Figure 6.5) that *might* be the haft element of an unfluted late Paleoindian lanceolate point. It remains, however, an isolated find, much like the two points McLean and Peter (2004:66) described in another collection from the general area. As an isolate, it provides little information. Perhaps the most that we learn from this point's presence, *if* it is a Paleoindian point, and from the presence of the two points reported by McLean and Peter, is that such Paleoindian remains as there are in this area are attributable to late Paleoindian presence, sparse as it might have been. Clovis remains unrecorded in this area.

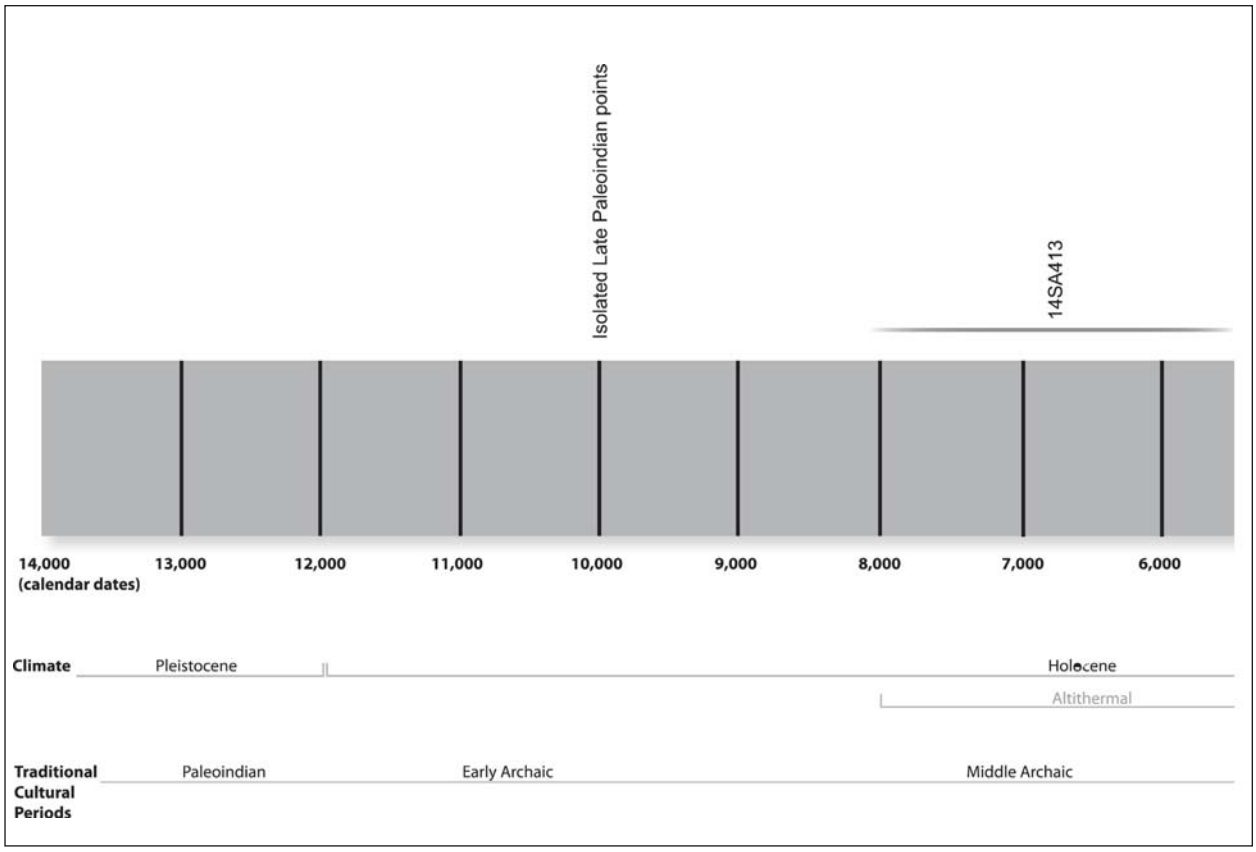
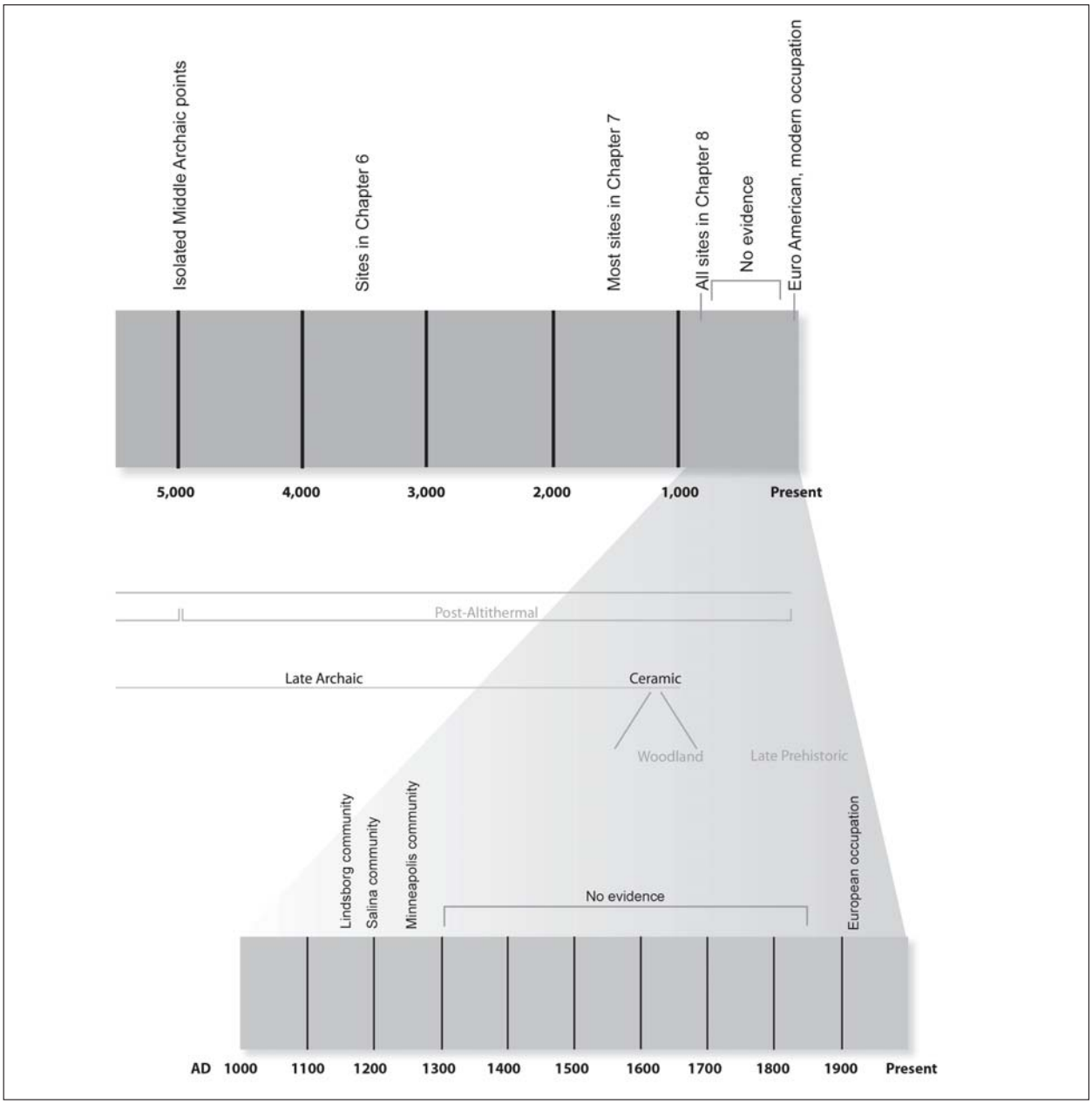


Figure 11.1. (facing pages) Timeline for Central Kansas Prehistory

The Early Archaic Logan Creek complex, the type site for which is the Logan Creek site (25BT3) in eastern Nebraska (Kivett 1962), really is the earliest cultural complex represented in the CKRA collections, and then only sparsely. In the Reed Collection, this complex is indicated at site 14SA413 and as an isolated point in the collection from late prehistoric site 14SA406. Blackmar and Hofman (2006:49) date this complex to the interval 6150 to 5200 rcybp (approximately cal 7000 to 6000 BP, or 5050 to 4050 BC), based on a suite of radiocarbon dates from sites in Nebraska and western Iowa and beyond that yield similar diagnostic artifacts. Widga (2006:82) specified a time range more near 8500–5700 cal B.P. and, indeed, I recently obtained two nearly identical age determinations of about 6500 rcybp (ca. cal 7400 BP) from a site in southwest Nebraska (Roper and Hughes 2014:60). The time of this complex coincides with a mid-Holocene climatic episode variously known as the Altithermal or Hypsithermal, a hot and at least episodically dry interval of Plains climate history. Over a half-century ago, William Mulloy (1958:208), working in Wyoming, suggested that the Plains were uninhabitable and uninhabited at this time, and other archaeologists quickly accepted the suggestion. It now is well-known that this suggestion was incorrect and that there *is* an archaeological record of mid-Holocene occupation throughout the Plains, from southern Alberta and Saskatchewan to Texas, and from western Iowa and Minnesota to eastern Colorado and Wyoming. How that record was formed, in the sense of foraging-hunting strategies and their associated movements across the landscape, however, remains very unclear (e.g., Meltzer 1995).

Site 14SA413 is one of a number (exact number not known) of Logan Creek sites in Kansas, all of them known only from surface materials or limited testing. Equivalent age sites in Nebraska with more comprehensive investigations include



the Logan Creek site near the Missouri River in the northeast part of the state (Kivett 1962); the Spring Creek site (25FT31; Grange 1980) and, a few hundred meters away, site 25FT376, my 2012 investigations at which are recently completed and as yet only partially reported (Roper and Hughes 2014), in southwest Nebraska; and the Schudel site (25GY12) in the east-central part of the state (Roper 1998). These sites include strong evidence of bison procurement and processing, as do many sites over a larger area of the Plains (Walker 1992; Widga 2006; and references cited in these sources). The complete settlement system, however, is not known. Walker (1992:128), in a wide-ranging review, noted that sites are next to water sources on river banks, floodplains, or terraces. They also are found in alluvial fans. However, some known sites lie either on hillslopes overlooking river bottoms, as for example does the Schudel site (Roper 1998), or, in the case of 14SA413 and another site I once was shown in

Frontier County, Nebraska, on high terraces that also afford a good view of lower surfaces in the bottoms. These sites may well have served as lookouts for bison moving to water, and places where other activities were conducted while waiting for the bison to appear. Further, most sites with evidence of bison killing and processing have been found to be fall kills of multiple animals. This would not surprise Jack Brink, whose very clear presentation of a year in the life of a bison indicates that fall is the optimum time for communal kills because this is when the animals are in the best condition (Brink 2008:43–70). Obviously, it begs the question of what people were doing and where they were during the rest of the year. This is some of what Meltzer (1995) was addressing when he discussed Altithermal-age foraging strategies on the Plains.

Since the collection from 14SA413 is a surface collection, it cannot really provide much information about actual hunting or foraging practices in the CKRA at this time level. The unfortunate reality also is that bone preservation, which obviously is essential to evaluating hunting practices, often is poor in eastern Kansas. Although further examination of 14SA413 is warranted, should circumstances permit, and in principle could provide useful information about how bearers of a Logan Creek material culture were using the resources of eastern Kansas, it is not likely that the information yield would be extensive.

It is pertinent to take note of the lithic raw materials represented at 14SA413. While the collection is limited and likely is not fully representative of the entire assemblage, the collection is dominated by Florence A chert, with a smaller amount of other Permian chert and one piece of Smoky Hill jasper. The isolated point from 14SA406 was made from a quartzite that probably comes from a primary source area to the west. Given that there are no strictly local cherts in the CKRA, the primary source area for any raw materials represented there will be beyond it. In this case, those primary source areas are to the south and east, with only one object of chert from a western primary source area. It might be noted in passing that a cultural horizon apparently temporally equivalent to Logan Creek but on the Southern Plains, in southern Kansas, Oklahoma, and northern Texas, is identified by Calf Creek points (as noted in Chapter 4, Paleoindian and Archaic cultural complexes often are projectile point cultures, and Calf Creek is another instance of that) and evidence from the Grouse Creek site (14CO120) in Cowley County indicates an extensive use of Florence A chert by the makers of those points (Duncan 2013). In this case, it is possible that the source area, which extends into northern Oklahoma (where it is called Kay County chert—state lines can make as much of a difference in geologic nomenclature as in other matters) was used by people of multiple contemporaneous cultural traditions.

The single projectile point from site 14SA447 and a very similar isolate in late prehistoric site 14SA410 seems to place the site sometime later during the Paleoarchaic interval, specifically the time of the Chelsea phase. It is incautious to assign 14SA447 and the 14SA410 isolate to this phase, though, since that taxon is nebulously defined and so far recognized in subsurface context only at the Snyder site where it was named (Grosser 1973) and at one other nearby site (it also would violate the principles established for this study). Attributing the site and the isolate to an occupation sometime in the fourth millennium rcybp (about 4500 calendar years), however, may be warranted and seems to indicate some land use in the CKRA by people of the same cultural tradition as were also using south-central Kansas. In this case, though, although the number of objects is very limited, it is notable that no raw materials from nearby are represented, and all materials are from primary source areas to the west. This includes obsidian of a source type (Malad) whose primary known source area is in southeastern Idaho. That material probably was not directly procured by Archaic peoples, but rather obtained by exchange. How obsidian reached the Central Plains in Paleoindian and Archaic times is further discussed by Hofman and Blackmar (2013) and by Roper and Hughes (2014).

Post-Altithermal Cultural Continuum

The modern Plains biota was established following the end of the Altithermal. Composition of biotic zones and their distribution has fluctuated some in the millennia since, but at a localized scale, not the continental or sub-continental scale of earlier millennia. Throughout the Plains, this became a time of settling into more localized areas

and of intensified use of local resources. It was accompanied by technological innovations, visible in the archaeological record as new tool classes, and probably a reorganization of tool manufacturing technology. The record also seems less sporadic and more continuous, perhaps partially as a result of less erosion and better preservation, but also more sustained and more intensive use of localities leading to increased visibility of the remains of past occupations. The materials in the Reed Collection document a cultural evolutionary sequence lasting into the thirteenth century A.D. and reflect that post-Altithermal settling into the CKRA.

The initial settling in, with attendant changes in assemblages and sheer site visibility became apparent in the CKRA at a time that cannot be precisely stated on the basis of present chronometric data (there are none for this area) but that probably is within the last four millennia or perhaps even three millennia. This is best reflected in the area by the remains at 14SA424 in the Crystal Springs Creek/Saline River confluence area. This site contrasts markedly with the earlier sites (14SA413 and 14SA447) in the study area. It is much larger, it has considerably more debris, and the remains are more diverse in terms of the numbers of object classes represented in the assemblage. It is not necessary that this reflects a larger occupying group or one that represents sedentary people. The people who used this site, like their predecessors, were mobile hunter-gatherers, and the site very probably accumulated as people, and the descendants of the original occupiers, returned periodically over the years, decades, or even centuries.

We might predict from the technology that mobility patterns took people over an area smaller than their predecessors had used, and that larger prey, such as bison or deer were important dietary resources. The technological indicator of this kind of mobility is the preparation of large bifaces that permit the user to carry raw material that has had its bulk reduced, much as a serious backpacker will reduce weight of items in their load wherever possible, but yet leaves options for replacing tools as needed while moving from place to place. This is particularly important, and often noticeable, in situations where raw material is not available locally. Lewis Binford (1979) has referred to this as a curated technology. The 14SA424 assemblage, with its large bifaces and evidence for manufacture of tools that are readily made on flakes derived from these bifaces or, as in the case of projectile points, by further reducing and shaping the biface itself, nicely exemplifies this. In fact, the Richard Stauffer Collection at Wichita State University contains an apparent cache of Permian chert bifaces from this site.

It is pertinent to ask whether the diversity of projectile point forms represented at 14SA424 means different groups of people used this location, each with a signature point type; the passage of time, with point changing forms through time, or a single group and its descendants, probably also using it repeatedly over some interval, who made and used several "types" (in the present-day archaeologists' perception) of points. This is a widely debated topic and no easy answer is available. It would be quite surprising to learn that this site was anything other than one that accumulated over a period of some centuries. It might be valuable, however, to also accept the premise of some recent authors (e.g., Sassaman and Holly 2011) that hunter-gatherers, as these people were, were not passive captives of relentless ecological circumstances, but rather were active agents in making their own history under prevailing ecological and social circumstances. In this case, what are viewed as new "types" of projectile points and other stone tools may be viewed as technological innovations, experiments with new hunting weapons systems (it must be remembered that a projectile point is only one part of a weapon), perhaps as the diversity of hunted prey increased. New tool classes for accomplishing fabrication and processing tasks associated with new lifeways may also be reflected. In essence, then, a plausible interpretation of the diversity of projectile point forms and tool forms at 14SA424 is that while a substantial amount of time (based on cross-dating) is represented, Central Plains people also were redesigning their weapons and entire tool kits as circumstances changed. These circumstances likely included climatic fluctuations, but also might have included population growth, diet breadth expansion, reception of new ideas through interactions with other groups, or all of the above and other factors too.

The pottery in the 14SA424 collection could be one of the technological innovations of sometime during this interval. It is not so many decades ago that the Archaic period was considered aceramic,

and the beginning of the succeeding Woodland period was defined by the appearance of pottery, among several other traits. But it also is a number of decades since archaeologists in the middle of North America began to realize that pottery *was* present in some sites that were not only culturally "Archaic" but that pre-dated, sometimes substantially, some of the other innovations normally associated with later times. Many of these sites are in the Southeast (Sassaman 1993 reviews this evidence), but early pottery is not confined to that region. At the eastern edge of the Plains, the most outstanding example is the pottery from the Nebo Hill site (23CL11) in northwest Missouri, dated to 3555±65 rcybp (ca. cal 4071–3664 BP) (Reid 1983:19). Similar pottery has been recognized in several other contemporaneous sites in northwest Missouri and extreme eastern Kansas (Reid 1983:15). Pottery was not ubiquitous at this time and the question concerns why this innovation came about in this place at this time, how it was used, and why it makes only a sporadic occurrence in the region at this time. A key to understanding its role is recognizing that pottery probably was introduced as an element of food preparation and presentation technology. Elsewhere in the midcontinent, including the Nebo Hill site area, it is apparent that nut processing was being intensified at this time (Simon 2009), and it sometimes is thought that early pottery served to hold nut oil. Other possibilities, of course, must also be considered. Analyzing the composition of residues absorbed into vessel fabric would be one way to determine the use of these vessels.

The bottom line, though, is that at present, 14SA424 is known only from surface material in the Reed Collection and the Richard Stauffer Collection. Thus, we do not know if the site was stratified, we do not know the specific age of components within it, we do not really know the diet of the residents, except that a few bison bones suggest that animal was a part of it, and we do not know what plant foods might be represented there. We also do not know the current condition of the site and whether any part of it remains that might be investigated to address some of these, and other, issues. It is, however, a site that appears to have, or have had, the potential to provide a wealth of information about a very poorly known interval of regional prehistory.

It might be noted that 14SA424 is unique in the CKRA. Similar materials are found at 14SA431, which lies nearby and may be an outlier of 14SA424, and at 14SA409, which lies immediately across the Saline River and also may be an outlier of 14SA424. The three sites are best considered collectively as a single extensive, but probably differential, and certainly multi-component, scatter of debris accumulated over a large amount of time. The only other site with similar material represented in these collections is 14SA412, south of Salina on the north-south segment of the Smoky Hill River. The quantity of material of an age equivalent to some of that at 14SA424 is limited, the diversity of point styles is limited, and considerably less time is represented. The records do not indicate whether this component of the site is discrete and set apart from the main late prehistoric component. If it were, and if it retained any integrity, it too would have the potential to contribute information about this early post-Altithermal interval.

Following a hunter-gather, or forager, lifeway does not mean that foragers eat anything they find and take the first animal or plant they encounter, or maintain a diet where, as a phrase I once saw somewhere put it, anything that wiggles goes into the pot (metaphorically, since many of them did not use pots). Rather, they focused on certain preferred species. In many cases, hunters might find it prudent to forego the first animal they encountered (they would have to spend the time to field dress it and then transport it too, after all) in favor of spending additional time to pursue the preferred prey, which often was large mammals, such as bison, wapiti, or deer, rather than the usually more quickly obtained but substantially smaller food packages provided by, say, a rabbit or a turkey. In additional to the greater return in food, often measured in calories in modern models of dietary strategies (cf. Bettinger 2009), another reason for concentrating on certain prey is having the knowledge of the animal's behavior necessary for successful capture (Frison 2004 contains an excellent discussion) and the availability and knowledge of the appropriate weaponry/capture technology for procuring the resource. Conversely, though, the adequacy of a specific dietary strategy is dependent upon sufficiently regular encounter with the preferred prey to ensure sufficient quantities of food to sustain the commensal group. If this requirement is not met, then one possible response

is to broaden the diet and adjust the procurement and preparation technology necessary to use the added resources. I will argue that this dietary and technological shift, with a corresponding shift in settlement and mobility strategies (which, in a very real sense, are part of the procurement technology), is strongly reflected by the CKRA archaeological record, particularly for the last one-and-a-half or perhaps two millennia. The shift need not have been abrupt, for the archaeological record at a site such as 14SA424 was laid down over the course of minimally some centuries. If the various occupations could be teased apart, and if preservation of organic remains was good enough, it is possible that the record would reflect small on-going shifts that cumulatively reflect substantial change in diet and technology by the time the site was last used compared to when it was first used. Such a change, however, also becomes more readily perceptible when we look at culture from the vantage point of other, and later, sites.

Site 14SA424, and the contemporaneous sites, apparently were no longer used after a time that is uncertain but probably was sometime around the middle of the first millennium A.D. What its archaeological record reflects is a settlement system that had become more complex within the CKRA, while still using the area during only part of the year. At this time, a new site location in the Crystal Springs Creek/Saline River confluence area apparently emerged as a locus of repeated occupation. This is 14SA432, which lies about a mile or so east of 14SA424. Site 14SA425, also in this area, may be a second, somewhat smaller, example. Why this shift in base camp location was made is unknown, but hydrological change is one possible factor, perhaps with the creek changing course and confluence point dramatically sometime in the first millennium—it has changed dramatically in the century-and-a-half since the GLO plat was drawn and almost certainly also did so in the past. In any event, also reflected at this time is the use of small, short-term campsites (Intermediate group), so many of which are represented in the Reed Collection and described in Chapter 7. These are, as indicated in that chapter, small sites that lie adjacent to the meander scars and oxbow lakes cut off from the main rivers, or occasionally adjacent to the main river itself. Artifact diversity is limited, but assemblages may contain pottery, small projectile points, a few pieces of debitage, mussel shell, and a few pieces of bone. It should not be overlooked that mussel procurement and processing produces a large amount of waste that is not attractive to scavengers. Further, shell is alkaline and neutralizes acidic soils surrounding it, thus raising the visibility of these sites by both preserving itself well and helping to preserve bone in tight association with it. I noted earlier, and reiterate, that the buried South Block component at the Claussen site (14WB322) in Wabaunsee County may well be an undisturbed analog to these sites (Roper 2005b).

Both the positioning of camps near the rich wetlands and the presence of the shells of mussels that would have been procured from those wetlands attest to the addition to the diet of aquatic resources, including mussels and probably also fish that are unlikely to be reflected by surface remains alone (fish bone was abundant in the shell heap at Claussen). These foods obviously do not come in packages the size of deer or even a rabbit, but they do have certain properties that make them worthwhile additions to the diet, viz., they are abundant and are not readily depleted, they are easily procured, they are overall predictable in both space and time, and, for the most part, their procurement can be scheduled around other procurement activities that are more time-sensitive (Claassen 2010 provides interesting perspectives on these and other aspects of shellfish as food).

The inference that this dietary addition, and certainly the very obvious settlement shift in the CKRA, appears to have occurred in the mid- to late first millennium A.D. or so is drawn in the absence of radiometric data for the area and using broad cross-dating from artifacts, especially projectile points. It likely is in the ballpark, but certainly is subject to confirmation with future investigations. The pottery at this time is represented as vessels whose form cannot reliably be determined on the basis of materials from these specific sites, but the predominant pot form likely is an elongated, sub-conoidal jar with an unrestricted or only slightly restricted neck (Figure 10.6a), and perhaps was similar to a reconstructed vessel from the Forrest site (14PA303) in Pawnee County (Hoard and Bozell 2015). In fact, rim characteristics, such as are reflected at 14SA418 or 14SA411 in this study (Figures 7.3 and 7.4) are very consistent with those from Forrest. As we saw

in Chapter 10, thicknesses of the CKRA sherds range from 3.3 to 14.6 mm, with a mean of 8.2 and a median of 5.95 mm. This compares favorably with the mean of around 8 mm for the Forrest site pottery (Hoard and Bozell 2014:Table 8).

Projectile points from these CKRA sites are summarized in Table 11.1. This summary shows that the projectile points include Snyders points, but for the most part are small corner-notched arrowpoints. These again have comparisons to the materials from sites such as Forrest (Hoard and Bozell 2015:Figure 14). They may reflect the use of 14SA432 but also dispersion into small specialized extraction camps over an interval of several centuries and into the early second millennium.

The aquatic resources added to the diet did not become the basis for the diet. Fish and mussels were not mere dietary supplements, however, but rather were regular elements of a diet that, during the previous centuries greatly, albeit gradually, increased in breadth. Another element that may have been added to the diet around this same time, but again did not yet become the basis for the diet, is cultivated crops, including, but not limited to, corn. Unquestionably, corn and other cultigens, such as sunflowers, lambsquarter, amaranth, and marsh elder, were being grown on the eastern Central Plains in the first millennium (Adair 2003). That we do not have evidence of cultigen use in the CKRA at this time may be because of the lack of any excavation into sites occupied during this interval. However, we also have no assurance that the complete settlement system of this interval is represented in the CKRA—to the contrary, it appears that the complete settlement system is *not* represented in the area. Certainly no recorded site in the CKRA, including 14SA432 or 14SA425, appears to be an analog of sites such as, for example, the Avoca site (14JN332) in Jackson County, where a small structure and evidence of cultigen use were recovered with small corner-notched points (Baugh 1991), or similar sites elsewhere in eastern Kansas. The radiocarbon age determinations from Avoca calibrate to calendar dates that most likely fall in the range cal A.D. 700–900 (this calendar date range for Avoca is my interpretation based on calibrating and plotting all available age determinations listed in Hoard and Banks 2006:296–297 for this site). It is possible that the people who were making the highly visible use of the CKRA at this time were entering it for specific purposes, including aquatic resource procurement, only during certain times of the year, and were conducting their agriculture elsewhere, possibly at sites like Avoca and similar sites to the east, during other parts of the year. Thin-sectioning some of the pottery and comparing it with thin-sections of material from sites beyond the CKRA potentially could show movement of pottery from place to place, reflected in varying composition of mineral inclusions in the ceramic fabric, be either natural or deliberately added temper, due to different bedrock configurations across the region.

Another possible clue to the seasonal cycle of people at this time, although we have to learn more about how to read that clue, is contained in the lithic raw material from 14SA432 and other sites. The assemblages from the earlier 14SA424 and the smaller assemblage at 14SA412 are dominated by grey Permian cherts. In contrast, assemblages from 14SA432 and the small resource camps are dominated by a lighter tan/yellow chert that also is from a Permian source. This may be the Florence A quarries at the southern end of the Flint Hills, or some other source within the Flint Hills—we do not yet well understand the spatial distribution of the variation within Permian cherts—but it nevertheless reflects a different source area and a shift in the definition of the area either through which people moved during their annual rounds or that was used by others with whom the people using the CKRA had exchange relations. Better pinpointing the location of the source area for this chert might help direct us to where people at this time were spending their time when not in the CKRA.

In effect, then, while people in this general region of the Plains during the late first/very early second millennium were considerably less mobile than people of earlier millennia, they had not yet become fully sedentary. With a broad and reliable diet developing in the greater region surrounding the CKRA, and with an intensification of the use of cultigens, sedentariness came to the CKRA fairly early in the second millennium, and left a voluminous and prominent record during what turns out to be an interval of only about a century.

This is the part of the CKRA archaeological

Table 11.1
Diagnostic Objects in Chapter 7 Sites

Site number	Pottery	Snyders	Small cn	sn/un	Mussel shell	Bone
14SA436					x	
14SA418	x			x		
14SA411	x		x		x	
14SA429	x				x	x
14SA423	x		x		x	
14SA451	x	x			x	x
14SA430			x			
14SA419	x		x			
14SA434	x					
14SA440	x				x	x
14SA443	x				x	x
14SA442	x					
14SA433	x		x			x
14SA446	x					x
14SA441	x				x	x
14SA425	x		x	x		x
14SA428	x			x		
14SA417	x					
14SA432	x	x	x			

record that we can more firmly place in calendar time, In my study of the Whiteford site, I assembled all available radiocarbon dates for the Smoky Hill phase as a whole, calibrated them, and used them to suggest that the phase as a whole and as understood at that time, could be placed "in the twelfth and thirteenth centuries, and probably also the late eleventh century," persisting into the early fourteenth century (Roper 2006a:40–41). Meanwhile, we have obtained a substantial number of new radiocarbon dates on annual plants, primarily corn (not on wood charcoal that can give misleadingly old dates) (Roper and Adair 2011, 2012). Recently, therefore, I undertook a very detailed study of the Central Plains tradition radiocarbon dates dataset for the Kansas River basin and adjacent Missouri River valley, bringing to the project a process wherein the individual age determinations were evaluated for their accuracy and only those that survived the evaluation were used to construct a timeline for the area. While the process weeded out a significant proportion of the age determinations, those it retained accurately indicate the age of occupation in the area. Ages were evaluated for individual lodges, and, as long as the individual age determinations were consistent with one another, multiple accurate ages from the lodges were combined mathematically, and the combined age was calibrated to obtain a calendar date (cal A.D.) for each lodge. Of course, a lodge was occupied over an interval of time, but that interval was small and certainly well within the limits of even the most precise dates, so a single date is a realistic number. Further, rather than considering an arbitrary tradition of phase as a whole, I isolated individual drainages or segments of drainages as localities and evaluated the dates of lodges within them. The result was a clear and consistent message. Sedentary occupation, permanent residence in the CKRA, the construction of durable housing and maintenance of household-based farmsteads, increased cultigen use, the formation of communities as collectives of the dispersed households, and

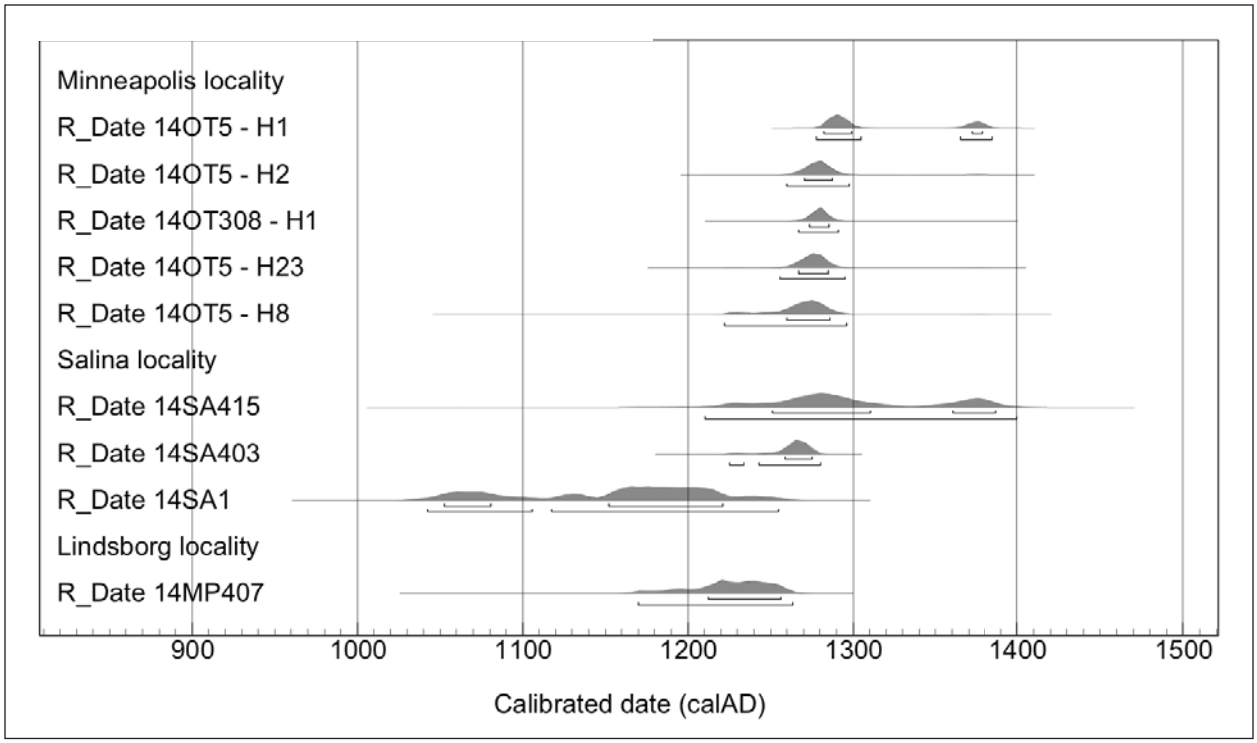


Figure 11.2. Radiocarbon Chronology of CKRA Late Prehistoric Sites

the construction of formal cemeteries in the CKRA began in the Lindsborg and Salina areas in the 1100s and continued into the mid- to late 1200s (Figure 11.2).[7] Other lines of evidence show that this was a process and not an abrupt event. This lifeway became apparent slightly later in the Minneapolis area, but was short-lived there, lasting no later than it did in the Salina area (Roper 2014).

The ceramics in sites extending from 14SA408, in the Bridgeport area, and along the Smoky Hill River through northern McPherson County provide information that is very pertinent to understanding how this happened (i.e., recognizing what happened and when). As shown in Chapter 10, the pottery from the Lindsborg locality is distinctive in several ways. Some indications, including general impressions, are that this set of sites is earlier than those in the Salina locality, but too few radiocarbon dates are available for that to be more firmly posited. The pottery from 14MP407 and nearby sites is somewhat thicker than material from sites in the Salina and Minneapolis localities, although that is not necessarily a reliable indicator of age and to use it as such would be circular reasoning. However, most pottery vessel rims are more similar to those associated with earlier sites than they are to those associated with the later sites. That is to say, a substantial proportion of them exhibit the elongated and slightly restricted necks of the earlier vessels. We do not know the form of the complete vessel. However, a possible analog is some of the vessels in Paoli phase assemblages from the Washita River valley in Garvin County, Oklahoma. Richard Drass (1995) dates this phase to around A.D. 1000–1250, a time that is contemporaneous with, but also begins somewhat earlier than, the sedentary occupations in the CKRA, at least as we currently understand the CKRA chronology. Given my recent work with the Kansas/Nebraska chronometric data, I would be concerned that the early part of this Paoli phase time range might be artificially elongated by old-

7. Some age determinations that appear earlier than 14MP407 have been obtained, but there are very good reasons to suspect that they do not accurately date the remains with which they are associated. I must emphasize that this statement is based on a detailed study, in which dates were assessed for accuracy using a systematic set of evaluation criteria. Only those dates that survived this filtering process are regarded as accurate and were retained for use in building a timeline. See (Roper 2014) for details.

wood-affected age determinations, except that some of the early age determinations for this context were run on cultigens or other short-lived materials and have a very good chance of being accurate (Drass 1995:146–149). Paoli phase vessels vary, but one class has a globular body and rims with elongated but only slightly restricted necks (Drass 1995:230). It is not impossible that the Lindsborg locality vessels took a similar form. This would make it a sort of intermediate form that represents an early stage in the redesign of predominant vessel shape in the study area. Only further work can resolve this issue.

Lodge form could be another indicator. Paoli phase sites have square to rectangular lodges with four interior support posts and an extended entryway (Drass 1995:162), very like the late prehistoric lodges in the Salina and Minneapolis localities. The lodge at 14MP407 was incompletely excavated so its form is not known, but it may be similar to the lodges of early second millennium central Oklahoma and, importantly for this study, one of the earliest known manifestations of this lodge form in the vicinity of the CKRA.

This is by no means to suggest that the Lindsborg locality sites were occupied by immigrants from what is now central Oklahoma. To the contrary, material in some of the collections from Smoky Hill River valley sites in northern McPherson County is quite similar to that of the small lower Saline River/adjacent Smoky Hill River valleys resource extraction sites described in Chapter 7, and, as with the Salina locality sites, some of these sites have small corner-notched points, implying that people were using this part of the CKRA for limited purposes in earlier times. I am far more inclined to suggest, therefore, that the people who used that part of the CKRA obtained and adopted into their cultural system new ideas about housing, about pottery, about certain cultigens, via interaction networks linking them to peoples to the south. In effect, what we see here is what we now epitomize as a Central Plains tradition lifeway emerging in the CKRA although not quite yet taking the form we associate with the classic late prehistoric sites of central Kansas.

Elsewhere (Roper 2007c), I suggested that the origin (I now prefer the word emergence, to better connote my belief that the so-called origin was much more a process than an event) of the Central Plains tradition represented the domestication of the Central Plains, using the term domestication as Wilson (1988:9) used it to refer to the introduction of planned, permanent durable housing. It is not to be confused with the domestication of crop plants or animals; in this usage, it is a process that changes how people interact with the landscape and with others and changes their overall world view (Wilson 1988; see also Hodder 1990).[8] The Lindsborg locality may contain the earliest visible evidence for this domestication and emergence of this lifeway on this part of the Central Plains. The process continued, probably in an overall time-transgressive manner, with permanent settlement becoming more widespread in first the Salina locality downstream, which is north, from the Lindsborg locality, and then farther north to the lower Solomon River locality (and, later, beyond). This was accompanied by continued redesign of the pottery and other material culture changes, as well as major changes in social organization and other intangible aspects of life.

In a sense, the mechanisms of this process (as opposed to the timeline of when and where it occurred, and what occurred) both in the CKRA and the Central Plains in general at this time level, have not been adequately addressed. Nearly three-quarters of a century ago, Wedel (1940a:319), speaking of the Central Plains tradition in general, remarked on what he saw as a lack of "incipient or nascent cultures in the area," but he recognized no such cultures because no earlier "cultures" had yet come to light and been put in their proper temporal position in this region. He, therefore, concluded that the Central Plains tradition had come in "virtually full blown from an older cultural environment," although he was unable to specify where that "older cultural environment" was. Such a mechanism, however, remains deeply unsatisfactory. As noted, my interpretation of the matter is that the emergence of the Central Plains tradition represents the domestication of the region, and, in general, the adoption of a new lifeway spread by contacts through kin-based networks. Updating that slightly, I suggest, as hinted above, that the emergence of this prominent cultural environment of the early second millennium in the CKRA was a product both of

8. It should be remembered that the Latin word *domus* means house. It is in this sense that Wilson and Hodder use the word domestication, and that I use it here.

adopting some exogenous traits and of innovations, either of them probably passed along through kin-based interaction networks and adjustments to the existing technology by people who were already using the area.

The medium upon which this process operated was the coming together of, and settling into the area by, small social groups that had been using the area regularly, but not year-around, for some centuries or even a few millennia. By around the mid-1100s, they had intensified their agriculture and made cultigens a more substantial part of their diet (even though it was not yet as intense or focused as it became in later times), retained their use of aquatic resources, and continued some hunting and procurement of wild plant foods. In essence, they maintained the dietary mix that had sustained them over the previous few centuries, but adjusted proportions of the diet that each comprised. They also may well have revamped procurement schedules, reworked their settlement system, and continued to reengineer their technology as part of the adjustment of their foodways. Thus, the material remains, at the artifact assemblage and feature levels, are as described in Chapter 8 of this study and in earlier reports of excavated sites (Latham 2006b; Roper 2001; Roper and Reed 2003; Wedel 1934a), and at the site distribution level, all appear rather differently than did their predecessors, but had been modified incrementally, not instantaneously. In essence, then, it is not so much that this late prehistoric occupation "began" around the late-1100s as it is simply that a developmental sequence crossed an indistinct threshold beyond which modern archaeologists recognize as a distinct, prominent, permanently-settled cultural complex. Population subsequently increased, perhaps with some newcomers, but probably largely by an increased birthrate under conditions of sedentary life. The archaeological record of this relatively short-lived complex is extensive and reasonably intensive in the study area.

The basic settlement pattern of this late prehistoric interval is one of small autonomous farmsteads that were dispersed across the front edges of terraces, near the major rivers. The farmsteads were centered on small, usually square to rectangular wattle-and-daub lodges, with a central hearth, and a varying number of, but commonly 3 or 4 (Roper 2009b:28), internal storage pits. It seems likely that lodges had associated external facilities, such as external storage pits, work or processing areas, and designated trash disposal areas (middens), as they did elsewhere on the Central Plains at this time. In the study area, however, farmstead investigations have been fixated on the lodges, and associated facilities are undetected. The possible exception is that some mussel procurement and processing probably continued at small extraction camps, but our knowledge of that is more a by-product of surveys than deliberate attempts to understand farmstead organization.

Farmsteads appeared throughout the valley of the Smoky Hill River in particular (Figure 8.1). They also appeared in the lower Saline River valley and the lower Solomon River valley. They are, however, fewer in number and density in these valleys than in the Smoky Hill River valley. A search of the state site files for Central Plains tradition sites in the Saline River valley turns up only 14SA409 and 14LC301, and some of the sites in the Minneapolis area as the only sites with this attribution in the lower Solomon River valley. This probably is not entirely a product of lower survey density in these latter valleys. One of several factors that may help explain the short occupation (and hence lesser accumulation of lodge remains), may be salinity. The general area, it will be remembered, is underlain by a salt member. The Saline River and the important lower Solomon River valley tributary, Salt Creek, flow across this salt member and, as their modern names imply, are saline. The Smoky Hill valley in Saline County flows just east of the edge of the salt member and, above (south and west of its confluence with the Saline River), receives few streams draining from the west (streams to the east are beyond the salt member). This is relevant because corn is not highly salt-tolerant. Although corn was being grown in small quantities in the region as a whole prior to late prehistoric times in this locality, if my interpretation of the settlement system is correct, it was not being grown in the CKRA specifically. Thus, the later people may have had to discover what their predecessors might not have learned and eventually gave up the effort to maintain a lifeway with a corn-based agricultural element in this area. Even in modern times, we see that while the area is intensely farmed, crops emphasize wheat and milo, each of which is

more salt tolerant than corn (Loomis and Connor 1992:383). It should be noted, however, that the Central Plains tradition lifeway persisted among people in valleys a short distance east of the salt member through the thirteenth and into the very early fourteenth century—in fact, sites reflecting this lifeway are rather numerous in the Republican River valley in particular in this interval.

Farmstead density is differential throughout the study area. This can be shown by taking an estimate of the number of lodges (not sites, which are arbitrarily defined and contain varying numbers of lodges anyway) present on the various identified sites discussed in Chapter 8 and totaling them by some measurement of area. Since almost no maps of lodge locations within individual "sites" exist, the only real data that can be used for this purpose are estimates given by various observers over a period of time ranging from the Whitefords' initial estimates from the 1930s to those made probably as recently as the 1980s or so. The collectively estimates are summarized by 1 mi^2 legal land sections portrayed on USGS topographic and county highway maps. A summary at this scale has heuristic value and is presented as a density map in Figure 11.3. The plot reveals that the Smoky Hill River/Saline River confluence area holds the highest density of lodge remains in the area. These include the Kohr (14SA414) and Winslow-Debold (14SA403) sites, in addition to 14SA409 and a few apparently single-lodge sites (14SAS415, 14SA416, and possibly 14SA421 and 14SA422). Densities decline nearly monotonically in an upstream direction, becoming low near the southern edge of the county.

This rough but indicative portrayal of the distribution of lodges/farmsteads adds to the data upon which another inference about this late prehistoric occupation is built, namely that of social organization. Social organization in the CKRA was considerably revised as the new sedentary lifeway emerged in the area. At this time, the now-permanent residents organized themselves into true communities in the social sense. I discussed this for the Salina locality at some length in my study of the Whiteford site (Roper 2006a:316–327). The study of additional lodge sites from the CKRA, even though based largely on surface material, and the ceramic analyses discussed in Chapter 10, which were unavailable when the draft of the Whiteford site manuscript was completed at the end of 2004, add to our understanding of community organization in this location.

I suggest that (as I suspected when I completed the Whiteford site study, but could not even begin to demonstrate at that time) several communities, represented as ceramic microstyle commonalities and argued to represent self-identified social units, can be identified in the study area (Figure 11.4). The Lindsborg locality sites, although poorly understood and as yet sparsely documented, constitute one of these. At present, we do not know the extent or too much about specific temporal placement. We also do not have a solid accounting for its pottery, other than obvious indications that some of its major characteristics are not like those of the pottery in the adjacent Salina locality. I do not make too much of the fabric, particularly temper difference because it likely reflects its very specific geological setting, or even the thickness, although that has to be considered. The vessel form differences, however, are considerably more indicative. My rapid pass through the extant collections from this area focused on the pottery and noticed the projectile points, but did not analyze other materials. Lithic raw material identifications also might produce particularly useful data.

A second and still the best known (or least poorly known) of the communities is that in the Salina locality, including the Whiteford site cemetery and the lodges sites associated with it. Following from the ceramic analysis, this community was composed of only those farmsteads extending from the Kohr site surrounding the cemetery to as far upstream as approximately the area of 14SA410. In other words, its areal extent is approximately 15 miles, or 24 kilometers, along the river. This size should not be a surprise. In a study of the geographic size of Mississippian chiefdoms in the Southeast, David Hally found those sociopolitical entities to vary from about 11 to 29 km across (Hally 1993:161). This is attributed to the travel time for people at the edges of the chiefdom to conduct business at its seat. To be sure, the Whiteford site community, and all other communities of the Central Plains tradition, did not exhibit the organizational complexity of a Southeastern Mississippian chiefdom, nor were population densities that of a

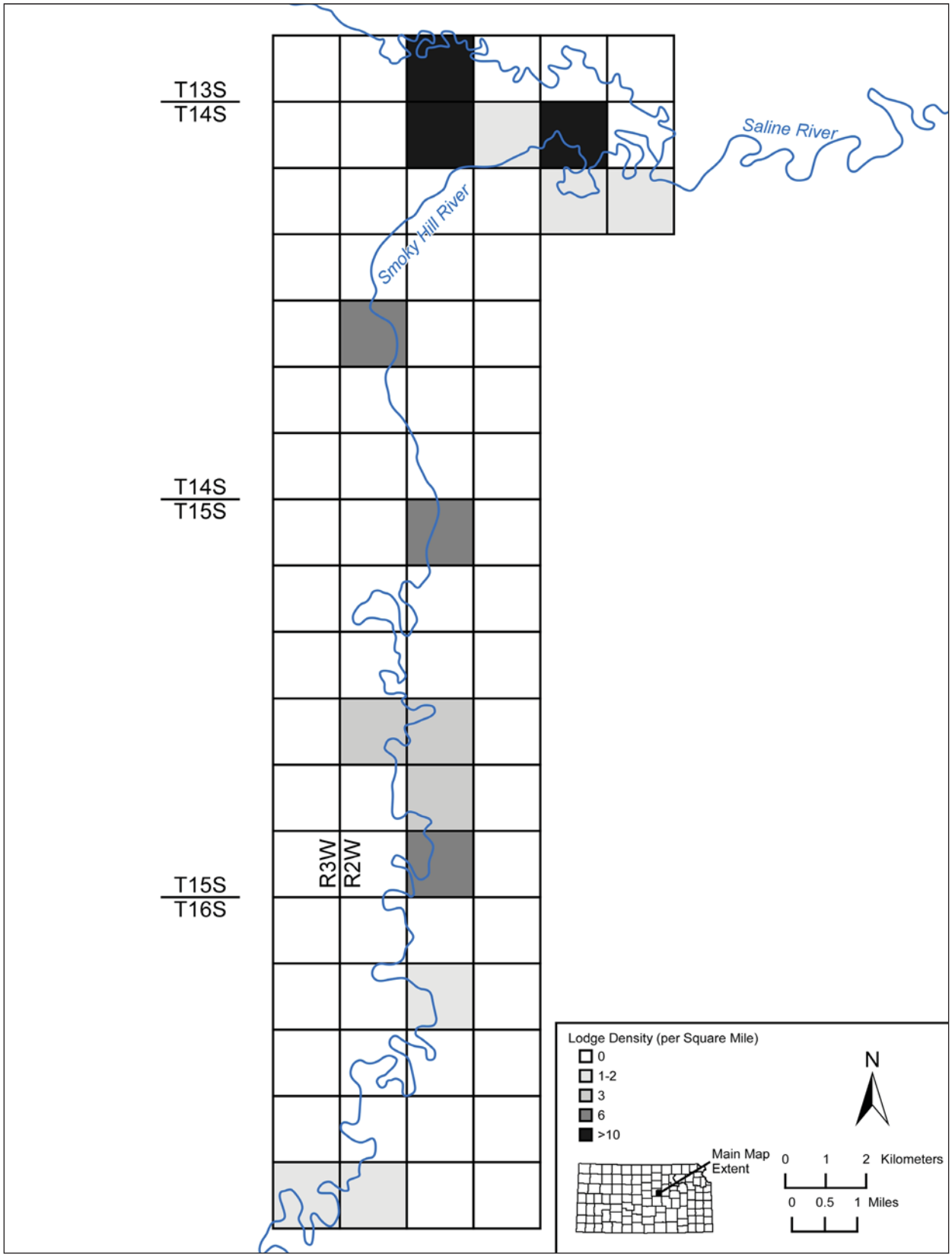


Figure 11.3. Lodge Density in the Smoky Hill River/ Saline River Area

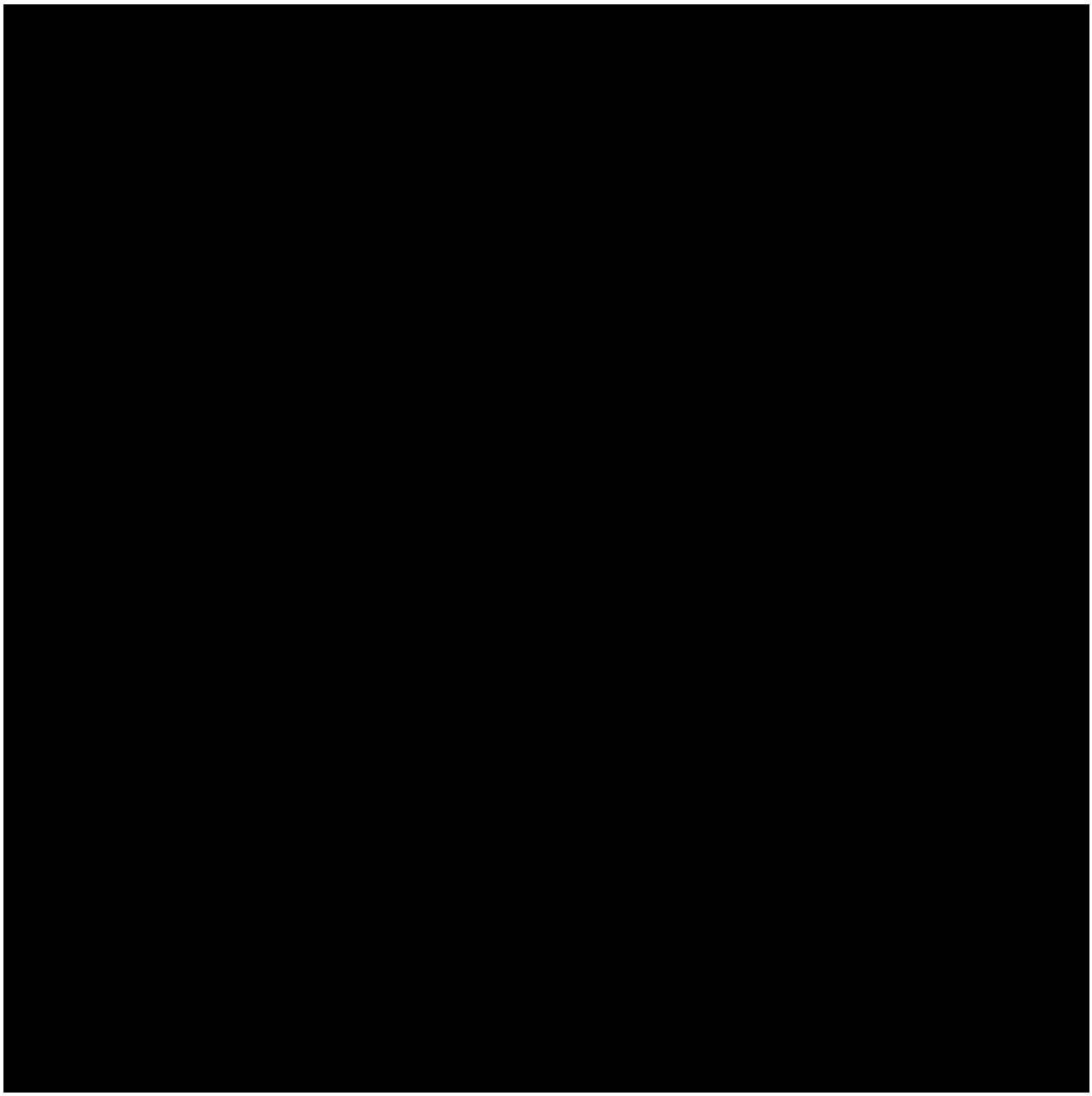


Figure 11.4. Extent of the Lindsborg and Saline Locality Communities

Southeastern community. However, travel time is determined by human biology and is independent of population density and political organization—it remains the practical maximum amount of time for members of a community, regardless of population and organization, to maintain regular contact and interaction with one another. It also bears note that the Whiteford site cemetery, which I have argued (Roper 2006a:324) is also something of a ceremonial center for this community, is at the northern edge of the community's territory, meaning that the farthest upstream residents had maximum travel time to this cemetery. Remembering that not all lodges were contemporary with one another, it still is the case that the increasing lodge density closer to the community center reflects a preference for placement and replacement of lodges closer to that center and enables more regular interaction among community members. Of course, even the most precise (smallest standard deviation) radiocarbon

dates do not permit a close determination of how many lodges/farmsteads were in use at a single time (not to mention that we have accurate radiocarbon dates for only some of them anyway), and thus preclude an estimation of the community's population.

The relation of the remains at 14SA409 to this community are not certain. The pottery is somewhat more frequently decorated and the decoration may be somewhat more complex than in the Salina community, but the suite of motifs is overall the same. From the Stauffers' report of exposing at least 19 burials in a small area there, it appears that it might have had its own communal cemetery, the extent of which is entirely unknown. No radiocarbon dates have been run, making it impossible to know its temporal relation to the Salina area sites. Any number of scenarios as to its meaning are possible. Without considerable additional data of various kinds, including radiometric dates on short-lived materials and the ceramic assemblage from a completely excavated lodge, as well as a better understanding of the site's extent and the possibility of unidentified outliers[9], any further discussion would be unconstrained and worthless speculation.

Likewise, the relation of 14LC301 to this, or any other, community is uncertain. The unusual, even for this area, dearth of decoration on the pottery from this site makes comparisons difficult, although it might make this assemblage more similar to the Lindsborg locality sites than to those in the Salina locality. However, the pottery is thin, and the rim sherds are direct and collared rim forms characteristic of Salina locality sites. A radiocarbon age reported by Witty (1962:30) appears early, but is on wood charcoal and has a large standard deviation, so it is suspect and did not pass the filtering process of my recent chronometric analysis. Two recently obtained dates, assayed on residue (Roper and Adair 2011), also are early, but they are inconsistent with one another and, like other dates on residue from sites in the Central Plains and well beyond, may be inaccurate (Roper 2013). I do not trust any of these dates and currently discount them. We are left as totally uncertain as to how to temporally assign 14LC301.

9. The Whiteford Collection records raise the possibility of at least one nearby site, but I have not examined the pottery and other objects from it.

The ceramic evidence strongly indicates that the Minneapolis locality sites, including the Minneapolis site, the Markley site, the other Ottawa County sites considered in this study, and several others (including 14OT305/317), constitute a third identifiable community in the CKRA. The radiocarbon age data suggest that this community probably was established slightly later than was the Salina locality community and was short-lived. It is more difficult to estimate lodge densities per unit of area from available data, although the size of the Minneapolis site as it is currently defined and the nearby "sites," such as 14OT403, suggest the highest density was at and around the Minneapolis site, in the Solomon River-Salt Creek confluence area. Site distribution, as currently understood, suggests a similar geographic size as the Salina area community. While this community has no overt indication of a center equivalent to the Whiteford site cemetery, some, including Harold Reed, have indicated the possibility of a communal burial area associated with the Minneapolis site proper. Testing and excavation to verify this would be prohibited under state law, but remote sensing to verify and protect the location would not.

In contemplating the possibility that the emergence of the communities in the Salina and Minneapolis localities represent a time-transgressive continuation of the process of domestication of the CKRA, it is useful to note that this need not imply the movement to the area of totally new peoples, but simply people who had made seasonal use of the area settling permanently in it, intensifying their agriculture, adjusting their technology to their new lifeways, and leaving a prominent archaeological record. I am under no illusion that the ideas from the south are the sole instigator of this change. We still do not know where the part-time users of the CKRA in earlier times spent the rest of their year and with whom they might have been interacting. I suspect that they had established interactions to the east, obtaining ideas from that direction, and, eventually, at least the people in the Minneapolis locality probably were receiving some ideas from the Oneota. They also, as people knowledgeable of their own circumstances, almost certainly would have been innovating and adapting to those circumstances.

In essence, then, the late prehistoric sedentary/agricultural occupation of the CKRA is a local syn-

thesis, involving existing knowledge of the area and its resources, some experience with agriculture earlier conducted on a limited basis elsewhere, an existing pottery-making tradition, new cultigens, and innovations to enhance performance characteristics of pottery and other technologies. Society was reorganized, with the individual households/farmsteads linking themselves into communities that regularly interacted. This included rituals and, if my interpretation in the Whiteford site study is valid, ritual feasting centered on communal mortuary facilities, without, however, establishing decision-making levels above the individual household. Some interaction with people outside the CKRA likely continued. Items such as the Caddo pottery vessel in the Whiteford site (Roper 2006a:189–190) and the large bifaces in both that site and three of the lodge sites (14SA407, 14SA409, and 14OT403) described here might suggest continued contacts to the south. The shell-tempered, shoulder-incised vessels that appear in small proportion in the Minneapolis locality sites (but not the Salina or Lindsborg locality sites) may suggest interaction with Oneota people, not by obtaining those vessels from Oneota potters, for they were locally made in the Minneapolis locality (Roper et al. 2010), but in the sense of incorporating a distinct vessel form and decorative motif from that source. Interaction among contemporaneous communities, such as those in the Salina and Minneapolis localities, that were not fully contemporary but did partially overlap in time, also is not precluded. In fact, to the extent some of the pottery in the Whiteford site cemetery is not stylistically consistent with that from the Salina area community, it is consistent with that from the Minneapolis community. It is interesting to note, however, that the two communities, while apparently maintaining some interaction with one another, also maintained external contacts that were entirely separate and, in fact, led in entirely separate directions.

Sometime about A.D. 1300 (based on accurate and calibrated radiocarbon dates), it all ended. At least it ended in the CKRA. Abundant radiocarbon evidence indicates that this overall lifeway continued to expand and thrive into the 1300s along a large portion of the Republican River in southern Nebraska and northern Kansas, as well as in the Blue River and other valleys tributary to the Kansas River. I suggested earlier that salinity, which is detrimental to corn agriculture, may have been a factor. Other factors also may have operated, but I do not put much weight on scenarios that suggest people were driven from the area by intruders, including Oneota people. The archaeological record of native occupation in the CKRA ends with the departure or disappearance of the late prehistoric people around A.D. 1300, and no one replaced them in the area, as we might expect intruders to have done. Later, the protohistoric people of the surrounding area—the Wichita, Pawnee, Kansa—likely passed through the CKRA on occasion, but even temporary sites of these people are nearly completely lacking in the area. The only exception is a few objects that might be from Great Bend aspect people. Certainly no sites indicating permanent occupation are known. Since these all were tribes that practiced an even more intense agriculture than that of their late prehistoric predecessors, it seems possible that they did not use the area for the same reason the late prehistoric people abandoned it. The area saw no permanent residents until the movement into the area by Euroamericans in the mid-nineteenth century.

CHAPTER 12

Conclusion: A Persistent Place in Central Kansas

The foregoing account of occupation history highlights in the appropriate places the long-term use of a specific locus within the CKRA, namely, the vicinity of the Crystal Springs Creek/Saline River confluence. Here lie the apparently repeatedly used sites 14SA424 and 14SA432, as well as the smaller but otherwise similar and probably also repeatedly used 14SA431 and 14SA425. The two larger sites appear sequential to one another, 14SA424 preceding 14SA432, with little indication of temporal overlap but also little indication of temporal gap between the cessation of use of 14SA424 and the initial use of 14SA432. Each site, however, contains a diverse set of diagnostic artifacts and each probably was repeatedly used over a substantial amount of time. Thus, the very specific landscape position changed sometime in the mid-first millennium, to judge from diagnostic artifacts, but the shift was over only a short distance and occupation continued in the same overall rather constrained area. As discussed earlier, it is entirely possible, although subject to confirmation, that hydrological changes led to this shift. Whatever the cause, this small shift does not negate the recognition of this Crystal Springs Creek locus as what some have called a *persistent place*. It is worth briefly reflecting on this notion and its implications.

The term persistent place was introduced into the archaeological literature in 1992 by Sarah Schlanger, writing about a location in southwest Colorado. Several authors have adopted the notion (Dooley 2008; Littlejohn and Allen 2007; Moore and Thompson 2012; Purtill 2012; Thompson 2010), using it to understand the nature of the archaeological record in their study areas. These do not present evidence of a continuing occupation, as in a permanent village. Instead, each is characterized by deposits left as people who were not sedentary returned to the location again and again, creating palimpsests of individual temporary occupations that were either directly superimposed over one another, or were in such close proximity as to create the impression of a single debris scatter (cf. Bailey 2007 on the concept of a palimpsest and a consideration of kinds of palimpsests in the archaeological record).

As Schlanger discussed it, however, and as other authors acknowledge, a persistent place is one that not only was repeatedly used, but that also represents "the conjunction of particular human behaviors on a particular landscape" (Schlanger 1992:97). She went on to suggest that a persistent place may have certain qualities that particularly suit it for specific behaviors, such as procurement of specific resources; may have certain specific features that suit it for repeated occupation, such as topographic features, or built features that focus repeated occupations; and/or may form because certain cultural materials are present, such as cached tools or objects lying about that can be refurbished and reused. The research problem for studying a persistent place then becomes understanding the particular qualities of a place so identified, and analyzing the deposits to evaluate the behavior involved in forming the record of the place. Interestingly, though, the cited studies do not seem to expand on Schlanger's formulation or, with one exception that is specific to its particular location (Moore and Thompson 2012), explore its larger meaning.

Considering the factors enumerated by Schlanger and used by others, it is suggested that the specific area around the mouth of Crystal Springs Creek is productively seen as a persistent place within the CKRA. Overall land use redundancy is low on the Central Plains and in the CKRA specifically. Many localities on the Plains reflect the maintenance of sedentary communities in a single location over periods of decades or even centuries—the late prehistoric community or communities in the CKRA is an instance—but the overlay of one occupation on another or even the repeated occupation that produces a horizontally extensive but continuous scatter, such as that in southern Ohio analyzed by Purtill (2012), are not common in the region. This is what makes the obvious evidence of repeated occu-

pation of specific loci near one another and near Crystal Springs Creek stand out.

On the basis of surface collections alone, it is difficult to know what qualities created this particular persistent place. Without arguing for any one or combination, though, it is possible to point out some factors that could have been involved. One is water. The modern place name, Crystal Springs Creek, is intriguing. Was this a place where unusually fresh water from springs was to be found? It does, after all, flow to a river currently named *Saline*. The locus also is at a point of land projecting into the valley near a bluff base. The point of land perhaps served as a landmark to help guide groups returning to the locus. The bluff base location, particularly one that might be reasonably well-watered, perhaps placed the site occupants near particularly good timberlands that would have provided wood for fuel and possibly nut mast—nuts were a well-used resource in Late Archaic times in the midcontinent (Simon 2009), and there is the one possible nutting stone from 14SA424 that perhaps is indicative. Deer also favor this type of habitat and thus would have been another resource at this locus. For that matter, timberland could have provided a certain amount of shelter for people during colder weather. Eventually, after a number of uses, the locus also would have held tools and debitage that could have been salvaged for further use, or that were deliberately stored there for later retrieval. The Richard Stauffer Collection from 14SA424 is said to contain a cache of bifaces, and the Reed Collection also contains a number of large bifaces that I suggested in Chapter 6 resulted from a curated technology and could be from a plowed-into cache. Perhaps all, none, or some combination of these, and/or other factors served to create this persistent place. It need not be compared to other possible places on the landscape to show that it is better than they are; it need only be examined as itself to consider why people chose to use this locus again and again for a considerable amount of time.

The larger meaning of this to the people who used it eludes us. Perhaps there was no deeper meaning than as a place with good water, wood, nut mast, and deer. Perhaps there was some deeper meaning. Perhaps any meaning changed over time, as the circumstances of life changed and as group identities formed and reformed. At this point in time, and with no evidence from which to make informed arguments, we simply cannot know the answer. What we can and do know, however, is that this fairly small place within the modest-sized CKRA held a particular attraction for people on the Central Plains over a period of some centuries or even a few millennia. It is a place well worth further examination to first determine if any evidence remains and, if so, to investigate with a strong research design that would seek to evaluate the stratigraphic context of the materials, determine if individual occupations can be teased apart, place them in time, and investigate the lifeways in this area at each of these points in time.

Regardless of our understanding or lack thereof, the place has considerable historical significance in that it effectively represents the human colonization of the CKRA. It repeatedly brought people to the same place, and they gradually became more and more familiar with this specific locus and the area surrounding it, with its possibilities and limitations and with the resources it provided. The Reed Collection as a whole suggests that the manner in which the area and its resources were used expanded over time from what effectively was a staging area. By sometime in probably the latter half of the first millennium A.D., land use had been intensified to accommodate the procurement of aquatic resources from the river floodplains, meander belts, and adjacent rich wetlands. People were still not staying in the CKRA year-around, but, as a result of continuing diet breadth expansion, they were using more of it for more purposes. By a few centuries later, people were settling in the area on a year-round basis and conducting agriculture on at least a modest scale, while also continuing to use many of the same resources as previously.

It is wrong, however, to assume that we are looking at a single "people," or what Sassaman (2010:45) referred to as a "discrete, self-contained population," that in a sense would be equivalent to that of a modern tribe or band within a tribe, occupying the area for centuries and probably millennia. Nor would it be any better to assume that such a line simply split periodically, producing a family tree of sorts. Many archaeologists now accept a reticulate model that specifies divergences, convergences, re-divergences/re-convergences, and so forth, as Sassaman (2010:44–57), for example, well described and illustrated. In the case of such an ancestry, it is

impossible to trace a single lineal ancestry for any single people. Social formations were fluid. Forager groups formed and split, sometimes seasonally in response to resource availability. Individuals or families aligned themselves with one group at one time and later with another. Repeated occupations of places like site 14SA424 may or may not have been the same individuals from occupation episode to occupation episode—births and deaths would have been a part of it, but shifting alliances among individuals or families may also have been involved. Although I suspect that, with the maintenance of reasonable permanent, year-round farmsteads, late prehistoric community composition was formed and reformed less fluidly than it had been by earlier foraging groups, social boundaries still were diffuse and permeable, as individual households made individual decisions, perhaps moving away to become part of the expansion of the lifeway into new areas, or new households were established within an existing community. Overall, then, the area witnessed long-term continuity of occupation by a long succession of generations that overall were part of a single broad but complex and reticulated ancestry, but whose social formations and identities varied over time. The essential point then was not direct lineal ancestry, but maintenance of a sense of place that included the CKRA. I argued in my interpretation of the Whiteford site that the cemetery

> served as an active symbol of the community to both the community and to outsiders, using the ancestors to justify the community's claim to the locality's resources. This would in effect say to one and all that this resource claim was not only active in the present, but had historical antecedents, as attested by the presence of the ancestors (Roper 2006a:321).

I stand by and reiterate that interpretation here. I also suggest that this study, based as it is on collections from numerous sites from a demarcated and regularly inspected study area, has enabled an appreciation of the depth of that ancestral use of the area and of the overall course of development in the entire CKRA.

References Cited

Adair, Mary J.
1988 *Prehistoric Agriculture in the Central Plains*. Publications in Anthropology No. 16. University of Kansas, Lawrence.
2003 Great Plains Paleoethnobotany. In *People and Plants in Ancient Eastern North America*, edited by P. E. Minnis, pp. 258–346. Smithsonian Books, Washington, D.C.
2006 Paleoethnobotanical Research in Kansas. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 248–263. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.
2013 Refining Plains Woodland Chronology. *Plains Anthropologist* 57(223):183–228.

Aimers, James John (editor)
2013 *Ancient Maya Pottery: Classification, Analysis, and Interpretation*. University Press of Florida, Gainesville.

Anderson, Adrian D.
1961 The Glenwood Sequence: A Local Sequence for a Series of Archaeological Manifestations in Mills County, Iowa. *Journal of the Iowa Archaeological Society* 10(3).

Arnold, Dean E.
1985 *Ceramic Theory and Cultural Process*. New Studies in Archaeology. Cambridge University Press, Cambridge, UK.

Bailey, Geoff
2007 Time Perspectives, Palimpsests, and the Archaeology of Time. *Journal of Anthropological Archaeology* 26:198–223.

Banning, E.B.
2000 *The Archaeologist's Laboratory: The Analysis of Archaeological Data*. Interdisciplinary Contributions to Archaeology. Kluwer Academic/Plenum Publishers, New York.

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

Baugh, Timothy G.
1991 *The Avoca Site (14JN332): Excavation of a Grasshopper Falls Phase Structure, Jackson County, Kansas*. Contract Archeology Publication No. 8. Kansas State Historical Society, Topeka.

Bayne, Charles K., and O.S. Fent
1963 The Drainage History of the Upper Kansas River Basin. *Transactions of the Kansas Academy of Sciences* 66(3):363–377.

Beck, Margaret
1998 Ceramics and Community Structure: A Reanalysis of Material from the Minneapolis Site (14OT5). *Plains Anthropologist* 43(165):287–310.
2001 Pottery Production at the Mugler Site (14CY1-A), A Central Plains Tradition House in North-Central Kansas. *Plains Anthropologist* 46(175):5–20.

Bee, James W., Gregory Glass, Robert S. Hoffman, and Robert R. Patterson
1981 *Mammals in Kansas*. Public Education Series No. 7. Museum of Natural History, University of Kansas, Lawrence.

Bettinger, Robert L.
2009 *Hunter-Gatherer Foraging: Five Simple Models*. Eliot Werner Publications, Clinton Corners, New York.

Bevitt, C. Tod
2006 14MP407, A Great Bend Aspect *[sic: Smoky Hill Phase]* Site in McPherson County, Kansas. *The Kansas Anthropologist* 27:85–126.

Binford, Lewis
1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35:255–273.

Blackmar, Jeannette M., and Jack L. Hofman
2006 The Paleoarchaic of Kansas. In *Kansas Archaeology*, edited by Robert J. Hoard, and William E. Banks, pp. 46–75. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.

Blakeslee, Donald J.
2004 The Stauffer-Allison Collection. *Current Archaeology in Kansas* 5:52.

Blakeslee, Donald J., Robert Blasing and Hector Garcia
1986 *Along the Pawnee Trail: Cultural Resources Survey and Testing, Wilson Lake, Kansas*. Report to the U.S. Army Corps of Engineers, Kansas City District.

Braun, David P.
1983 Pots as Tools. In *Archaeological Hammers and Theories*, edited by James A. Moore and Arthur S. Keene, pp. 107–134. Academic Press, New York.

Brink, Jack W.
2008 *Imagining Head-Smashed-In: Aboriginal Buffalo Hunting on the Northern Plains*. Athabasca University Press, Edmonton, Alberta, Canada.

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

Buchanan, Rex C. (editor)
2010 *Kansas Geology: An Introduction to Landscapes, Rocks, Minerals, and Fossils*. 2nd edition. University Press of Kansas, Lawrence, for the Kansas Geological Survey.

Buchanan, Rex C., and James R. McCauley
2010 *Roadside Kansas: A Traveler's Guide to Its Geology and Landmarks*. 2nd edition. University Press of Kansas, Lawrence.

Bush, Leslie L.
2004 *Boundary Conditions: Macrobotanical Remains and the Oliver Phase of Central Indiana, A.D. 1200–1450*. University of Alabama Press, Tuscaloosa.

Champe, John
1946 *Ash Hollow Cave, A Study of Stratigraphic Sequence in the Central Great Plains.* University of Nebraska Studies, n.s., No. 1. University of Nebraska, Lincoln.

Chisholm, Michael
1968 *Rural Settlement and Land Use: An Essay in Location*. 2nd edition. Aldine, Chicago.

Claassen, Cheryl
2010 *Feasting with Shellfish in the Southern Ohio Valley.* University of Tennessee Press, Knoxville.

Cline, Royce Lyle
1974 Geomorphology of the Lower Saline River Valley in Northcentral Kansas. Unpublished Master's thesis, Department of Geology, Kansas State University, Manhattan.

Cummings, Linda Scott, and Donna C. Roper
2010 Ancient Recipes Revealed!: FTIR Analysis of Central Plains Tradition Pottery. Poster presentation at the 68th Plains Anthropological Conference, Bismarck, North Dakota.

Deuel, Thorne
1937 The Application of a Classificatory Method to Mississippi Valley Archaeology. In *Rediscovering Illinois*, by Fay-Cooper Cole and Thorne Deuel, pp. 207–219. University of Chicago Press, Chicago.

Dooley, Mathew A.
2008 Investigating Persistent Places in the Northern Great Plains, Central North Dakota. In *Time in Archaeology: Time Perspectivism Revisited*, edited by Simon Holdaway and LuAnn Wandsnider, pp. 94–109. The University of Utah Press, Salt Lake City.

Drass, Richard R.
1995 *Culture Change on the Eastern Margins of the Central Plains*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Oklahoma, Norman. UMI Dissertation Services, Ann Arbor, Michigan.

Duncan, Marjorie
2013 Calf Creek Middle Archaic Campsites on the Flint Hills of Kansas and Oklahoma: The Grouse Creek and Kubik Sites. Paper presented at 71st Annual Plains Anthropological Conference, Loveland, Colorado.

Dunnell, Robert C.
2008 Archaeological Things: Languages of Observation. In *Time's River: Archaeological Syntheses from the Lower Mississippi River Valley*, edited by Janet Rafferty and Evan Peacock, pp. 45–68. University of Alabama Press, Tuscaloosa.

Emerson, Thomas E., Dale L. McElrath, and Andrew C. Fortier (editors)
2009 *Archaic Societies: Diversity and Complexity across the Midcontinent*. State University of New York Press, Albany.

Fagan, Brian
2006 *Writing Archaeology: Telling Stories About the Past*. Left Coast Press, Walnut Creek, California.

Failyer, G. H.
1881 Traces of the Aborigines in Riley County. *Transactions of the Kansas Academy of Science* 7:132–135.

Fenneman, Nevin M.
1938 *Physiography of Eastern United States*. McGraw-Hill Book Company, Inc., New York.

Ford, James A., and James B. Griffin
1938 Report of the Conference on Southeastern Pottery Typology. Reprinted 1960 in *Newsletter of the Southeastern Archaeological Conference* 7(1):10–22.

Fosha, Michael
1994 *A Case Study of Inequality Among Smoky Hill Variant Populations.* Unpublished Master's thesis, Department of Anthropology, University of Kansas, Lawrence.

Frison, George C.
2004 *Survival by Hunting: Prehistoric Human Predators and Animal Prey*. University of California Press, Berkeley.

Gifford, James C.
1960 The Type-Variety Method of Classification as an Indicator of Cultural Phenomena. *American Antiquity* 25:341–.347.

Gogel, Tony
1980 *Discharge of Saltwater from Permian Rocks to Major Stream Aquifer Systems in Central Kansas*. Chemical Quality Series No. 9. Kansas Geological Survey, University of Kansas, Lawrence.

Gradwohl, David Mayer
1982 Shelling Corn in the Prairie-Plains: Archeological Evidence and Ethnographic Parallels beyond the Pun. In *Plains Indian Studies: A Collection of Essays in Honor of John C. Ewers and Waldo R. Wedel*, edited by Douglas H. Ubelaker and Herman J. Viola. Smithsonian Contributions to Anthropology 30:135–156.

Grange, Roger T., Jr.
1968 *Pawnee and Lower Loup Pottery*. Publications in Anthropology No. 3. Nebraska State Historical Society, Lincoln.
1980 *Salvage Archeology in the Red Willow Reservoir, Nebraska*. Publications in Anthropology No. 9. Nebraska State Historical Society, Lincoln.

Grosser, Roger
1973 A Tentative Sequence for the Snyder Site, Kansas. *Plains Anthropologist* 18(61):228–238.

Gunnerson, James H.
1952 Some Nebraska Culture Pottery Types. *Plains Archeological Conference Newsletter* 3:39–49.

Guthe, Carl E.
1932 A Suggested Classification of Cultures. Committee on State Archaeological Surveys, National Research Council. Reprinted 2003 in *W.C. McKern and the Midwestern Taxonomic Method*, by R. Lee Lyman and Michael J. O'Brien, pp. 200–203. University of Alabama Press, Tuscaloosa.

Hally, David J.
1993 The Territorial Size of Mississippian Chiefdoms. In *Archaeology of Eastern North America: Papers in Honor of Stephen Williams*, edited by James B. Stoltman, pp. 143–168. Archaeological Report No. 25. Mississippi Department of Archives and History, Jackson.

Hawley, Marlin F.
1993 *A Keen Interest in Indians: Floyd Schultz, The Life and Work of an Amateur Anthropologist*. Bulletin No. 2. Kansas Anthropological Association, Topeka.

Hedden, John
1992 *Riley Cord Roughened Ceramic Variability as Exhibited by the Assemblages from Ten Smoky Hill Sites in Northcentral Kansas.* Unpublished Master's thesis, Department of Anthropology, University of Kansas, Lawrence.
1994 Riley Cord Roughened Ceramic Variation from Ten Smoky Hill Variant Sites in North-Central Kansas. *Central Plains Archeology* 4(1):27–42.

Hoard, Robert J., and William E. Banks (editors)
2006 *Kansas Archaeology*. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.

Hoard, Robert J., and John R. Bozell
2015 The Forrest Site: A Keith Phase Component in Pawnee County, Kansas. Manuscript on file at the Kansas Historical Society, Topeka, and the Nebraska State Historical Society, Lincoln.

Hodder, Ian
1990 *The Domestication of Europe*. Basil Blackwell, Oxford.

Ives, John C.
1955 Glenwood Ceramics. *Journal of the Iowa Archaeological Society* 4(3–4).

Jennings, Jesse D.
1949 Symposium on Ceramics and Pottery Typing: Introductory Remarks. In *Proceedings of the Fifth Plains Conference for Archeology*, assembled by John L. Champe, pp. 39–42.. Notebook No. 1. Laboratory of Anthropology, University of Nebraska, Lincoln.

Johnson, Alfred E.
2006 Foreword. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. vii–xii. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.

Josephs, Richard L.
2008 Petrographic Analysis of Central Plains Ceramics. Manuscript. University of North Dakota, Grand Forks.
2010 A Petrographic Investigation of Central Plains Ceramics from Sites in Nebraska, Kansas, and Oklahoma. Manuscript. University of North Dakota, Grand Forks.

Kaul, Robert B.
1986 Physical and Floristic Characteristics. In *Flora of the Great Plains*, by the Great Plains Floral Association, pp. 7–10. University Press of Kansas, Lawrence.

Kansas City Times
1938 Prehistoric Burial Pit is Discovered in Kansas, *Kansas City Times* February 10, 1938.

Keller, Angela H.
2009 In Defense of the Database. *The Archaeological Record* 9(5):26–32.

Kivett, Marvin F.
1962 Logan Creek Complex. Paper presented at 20th Plains Conference, Lincoln.

Kivett, Marvin F., and George Metcalf
1997 *The Prehistoric People of Medicine Creek Reservoir, Frontier County, Nebraska: An Experiment in Mechanized Archaeology (1946–1948)*. Memoir No. 30. *Plains Anthropologist* 42(162).

Klippel, Walter
1969 Chipped Stone. In *Two House Sites in the Central Plains: An Experiment in Archaeology*, edited by W. Raymond Wood, pp. 23–33. Memoir No. 6. *Plains Anthropologist* 14(44) pt. 2.

Knudson, Ruthann
2002 Medicine Creek Is a Paleoindian Cultural Ecotone: The Red Smoke Assemblage. In *Medicine Creek: Seventy Years of Archeological Investigations*, edited by Donna C. Roper, pp. 84–141. University of Alabama Press, Tuscaloosa.

Küchler, A.W.
1964 *Potential Natural Vegetation of the Coterminous United States*. American Geographical Society of New York, New York.
1974 A New Vegetation Map of Kansas. *Ecology* 55:586–604.

Latham, Mark A.
2006a Here Yesterday, Gone Today, No Tomorrow: Modern Agricultural Destruction of Smoky Hill Phase House Mounds. *The Kansas Anthropologist* 27:25–38.
2006b The Forsberg Site (14SA420): A Smoky Hill

Phase Habitation Site in Central Kansas. *The Kansas Anthropologist* 27:39–83.

Latta, Bruce F.
1949 *Ground-Water Conditions in the Smoky Hill Valley in Saline, Dickinson, and Geary Counties, Kansas*. Bulletin No. 84. State Geological Survey of Kansas, University of Kansas, Lawrence.

Lehmer, Donald J.
1954 *Archaeological Investigations in the Oahe Dam Area, South Dakota, 1950–1951*. Bulletin No. 158. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
1971 *Introduction to Middle Missouri Archeology*. Anthropological Papers No. 1. National Park Service, U.S. Department of the Interior, Washington, D.C.

Lindsey, Roche M.
2005 *Analysis of Feature 5 at the Late Prehistoric Barnes Site on the Southeastern High Plains of Colorado*. Unpublished Master's thesis, Department of Anthropology, University of Kansas, Lawrence.

Linton, Ralph
1944 North American Cooking Pots. *American Antiquity* 9(4):369–380.

Littlejohn, Judith, and Harry Allen
2007 Hunter-Gatherer Burials and the Creation of Persistent Places in Southeastern Australia. *Journal of Anthropological Archaeology* 26:283–298.

Logan, Brad
2001 *Cultural Resources Evaluation for Smoky Hill Air-to-Ground Gunnery Range, Salina, Kansas.* Report to Air National Guard/CEVP. PEER Consultants and DuVall and Associates.

Long, Stephen H.
1823 A General Description of the Country Traversed by the Expedition. In *The Account of an Expedition from Pittsburgh to the Rocky Mountains*, edited by Edwin James. Longman, Hurts, Rees, Orme, and Browne, London. Reprinted 1905 in *Early Western Travels*, Vol. 17, edited by Reuben Gold Twaites. Arthur H. Clarke Company, Cleveland, Ohio.

Loomis, R.S., and D.J. Connor
1992 *Crop Ecology: Productivity and Management in Agricultural Systems*. Cambridge University Press, Cambridge, England.

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

Lyman, R. Lee, and Michael J. O'Brien
2003 *W.C. McKern and the Midwestern Taxonomic Method*. University of Alabama Press, Tuscaloosa.

McElrath, Dale L., Andrew C. Fortier, and Thomas E. Emerson
2009 An Introduction to the Archaic Societies of the Midcontinent. In *Archaic Societies: Diversity and Complexity across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier, pp. 3–21. State University of New York Press, Albany.

McKern, W. C.
1934 Certain Classification Problems in Middle Western Archaeology. Circular No. 17. Committee on State Archaeological Surveys, National Research Council. Reprinted 2003 in *W.C. McKern and the Midwestern Taxonomic Method*, by R. Lee Lyman and Michael J. O'Brien, pp. 214–226. University of Alabama Press, Tuscaloosa.
1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *American Antiquity* 4:301–313. Reprinted 2003 in *W.C. McKern and the Midwestern Taxonomic Method*, by R. Lee Lyman and Michael J. O'Brien, pp. 250–261. University of Alabama Press, Tuscaloosa.

McKern, W.C., Thorne Deuel, and Carl E. Guthe
1933 The Problem of Culture Classification. Circular Letter. National Research Council. Reprinted 2003 in *W.C. McKern and the Midwestern Taxonomic Method*, by R. Lee Lyman and Michael J. O'Brien, pp. 208–213. University of Alabama Press, Tuscaloosa.

McLean, Janice A., and Jason Peter
2004 New Paleoindian Evidence from East-Central

Kansas. *Current Research in the Pleistocene* 21:65–68.

McPherron, Shannon P., and Harold L. Dibble
2002 *Using Computers in Archaeology: A Practical Guide*. McGraw-Hill/Mayfield, Boston, Massachusetts.

Mandel, Rolfe D.
1992 Soils and Holocene Landscape Evolution in Central and Southwestern Kansas: Implications for Archaeological Research. In *Soils in Archaeology: Landscape Evolution and Human Occupation*, edited by Vance T. Holliday, pp. 41–100. Smithsonian Institution Press, Washington, D.C.

Martin, Larry D., and Robert S. Hoffman
1987 Pleistocene Faunal Provinces and Holocene Biomes of the Central Great Plains. In *Quaternary Environments of Kansas*, edited by William C. Johnson, pp. 159–165. Guidebook Series No. 5, Kansas Geological Survey, University of Kansas, Lawrence.

Mead, James R.
1986 *Hunting and Trading on the Great Plains, 1859–1875*. University of Oklahoma Press, Norman.

Merriam, Daniel F.
1963 *The Geologic History of Kansas*. Bulletin No. 162. Kansas Geological Survey, University of Kansas, Lawrence.

Meltzer, David J.
1995 Modeling the Prehistoric Response to Altithermal Climates on the Southern High Plains. In *Ancient Peoples and Landscapes*, edited by Eileen Johnson, pp. 355–368. Museum of Texas Tech University, Lubbock.

Moore, Christopher R., and Victor D. Thompson
2012 Animism and Green River Persistent Places: A Dwelling Perspective of the Shell Mound Archaic. *Journal of Social Archaeology* 12(2):264–284.

Mulloy, William T.
1958 A Preliminary Historical Outline for the Northwestern Plains. *University of Wyoming Publications* 22(1&2).

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

Phillips, Philip
1958 Application of the Wheat-Gifford-Wasley Taxonomy to Eastern Ceramics. *American Antiquity* 24:117–125.
1970 *Archaeological Survey in the Lower Yazoo Basin, Mississippi, 1949–1955.* Papers No. 69. Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge, Massachusetts.

Phillips, Philip, James A. Ford, and James B. Griffin
1951 *Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940–1947.* Papers No. 25. Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge, Massachusetts.

Purtill, Matthew P.
2012 *A Persistent Place: A Landscape Approach to the Prehistoric Archaeology of the Greenlee Tract in Southern Ohio*. Gray and Pape, Inc., Cincinnati, Ohio.

Quinn, Patrick Sean
2013 *Ceramic Petrography: The Interpretation of Archaeological Pottery and Related Artefacts in Thin Section*. Archaeopress, Oxford, England.

Quinn, Patrick Sean, and Margie Burton
2008 Ceramic Petrography and the Reconstruction of Hunter-Gatherer Craft Technology in Late Prehistoric Southern California. In *Interpreting Silent Artefacts: Petrographic Approaches to Archaeological Ceramics*, edited by Patrick Sean Quinn, pp. 267–295. Archaeopress, Oxford, England.

Ramenofsky, Ann F.
1998 The Illusion of Time. In *Unit Issues in Archaeology: Measuring Time, Space, and Material*, edited by Ann F. Ramnofsky and Anastasia Steffen, pp. 74–84. Foundations of Archaeological Inquiry, James M. Skibo, general editor. University of Utah Press, Salt Lake City.

Ray, Jack H., Neal H. Lopinot, and Edwin R. Hajic
2009 Archaic Prehistory of the Western Ozarks of Southwest Missouri. In *Archaic Societies: Diversity and Complexity across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier, pp. 155–197. State University of New York Press, Albany.

Rice, Prudence M.
1987 *Pottery Analysis: A Sourcebook*. University of Chicago Press, Chicago.

Reedy, Chandra
2008 *Thin-Section Petrography of Stone and Ceramic Cultural Materials*. Archetype Publications, London, England.

Reid, Kenneth
1983 The Nebo Hill Phase: Late Archaic Prehistory in the Lower Missouri Valley. In *Archaic Hunters and Gatherers in the American Midwest*, edited by James C. Phillips and James A. Brown, pp. 11–39. Academic Press, New York.

Rice, Prudence M.
1987 *Pottery Analysis: A Sourcebook.* University of Chicago Press, Chicago.

Roper, Donna C.
1996 *Toward a New Perspective on Upper Republican Life in the Medicine Creek Valley: The Excavation of 25FT22, House 4, with Testing at Several Nearby Features*. Report to the U.S.D.I. Bureau of Reclamation, Great Plains Region.
1998 The Schudel Site Complex: Early Archaic Occupation in the North Loup River Valley. *Central Plains Archeology* 6(1):1–34.
2001 Five Smoky Hill Phase Houses in Saline and Ottawa Counties: The Whiteford Excavations, 1934–1945. *The Kansas Anthropologist* 22:83–169.
2003 The Whiteford Family of Salina: Mid-Twentieth Century Avocational Archaeologists. *Kansas History* 25(4):244–257.
2005a Rethinking the Analysis of Western Central Plains Tradition Ceramics. Paper presented at 27th Flint Hills Conference, Council Grove, Kansas.
2005b Ceramic Period Components at the Claussen Site, 14WB322, Wabaunsee County, Kansas. *The Kansas Anthropologist* 26:65–119.
2006a *The Whiteford Site, or Indian Burial Pit: A Smoky Hill Phase Cemetery in Saline County*. Anthropological Series No. 18. Kansas State Historical Society, Topeka.
2006b The House with 49 Abraders: Implications for Interaction Patterns on the Central Plains. Paper presented at 64th Plains Anthropological Conference, Topeka, Kansas.
2006c Smoky Hill Phase Settlement Patterns in the Salina Area. *The Kansas Anthropologist* 27:5–24.
2006d The Central Plains Tradition. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 105–132. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.
2007a Studying Social Organization in the Western Central Plains Tradition Using Ceramics. Paper presented at 29th Flint Hills Conference, Lyons, Kansas.
2007b Mobile Farmers of the Western Central Plains: Upper Republican Ceramic Variability and Its Implications. Paper presented at 72nd Annual Meeting of the Society for American Archaeology, Austin, Texas.
2007c The Origins and Expansion of the Central Plains Tradition. In *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay, pp. 53–63. University of Utah Press, Salt Lake City.
2008a Thinking About Human Remains at the Elliott Site. *The Kansas Anthropologist* 29:52–59.
2008b Setting the Stage in the 1930s: Waldo Wedel and Early Formulations of Central Plains Tradition Cultures. Paper presented at 66th Plains Anthropological Conference, Laramie, Wyoming.
2008c *Archaeological Investigations on a Portion of 14RC410, Rice County, Kansas: The Little River Archaeology Project*. Report to the City of Little River, Little River, Kansas.
2008d Frederick H. Sterns and the Portrayal of Variation in Central Plains Pottery. *American Antiquity* 73:361–369.
2009a A Clarification of Some Site Identifications. *Current Archaeology in Kansas* 8:55–58.
2009b 100° W Longitude: Exploring Cultural Dynamics at the Western Edge of the Central Plains Tradition. *Central Plains Archeology* 11:21–40.
2011a Shell-Tempered Pottery on the Central Plains. *Southeastern Archaeology* 30:268–287.

2011b The Chronological Position of 14RC410, a Little River Focus Site in Rice County, Kansas, and its Implications. *Plains Anthropologist* 56(220):347–363.
2012 New AMS Radiocarbon Dating Results for Central Plains Tradition Sites in Kansas and Nebraska. *Plains Anthropologist* 57(221): 39–52.
2013 Assessing the Reliability of AMS Dates on Food Residue on Pottery from the Late Prehistoric Central Plains of North America. *Radiocarbon* 55(1):151–162.
2014 Assessing the Radiocarbon Age Determinations Dataset and Revising the Chronology for the Central Plains Tradition. *Central Plains Archeology* 14: in press.
n.d. The Ted Hill Site, 25FR7: Curvilinear Houses and Small Cache Pits in the Central Plains Tradition. Manuscript in preparation.

Roper, Donna C., and Mary J. Adair
2011 Interpreting AMS Radiocarbon Determinations from Selected Central Plains Tradition Sites. *Plains Anthropologist* 56(217):3–22.
2012 Additonal AMS Radiocarbon Age Determinations for the Centtal Plains Tradition. *Plains Anthropologist* 57(221):31–38.

Roper, Donna C., and Richard E. Hughes
2014 Source Analysis of Obsidian Debitage from Two Early Archaic Sites in Nebraska. *Plains Anthropologist* 59(229):58–69.

Roper, Donna C., and Elizabeth P. Pauls
2005 What, Where, and When is an Earthlodge? In *Plains Earthlodges: Ethnographic and Archaeological Perspectives,* edited by Donna C. Roper and Elizabeth P. Pauls, pp. 1–31. University of Alabama Press, Tuscaloosa.

Roper, Donna C., and Harold Reed
2003 The 1970 Excavations at 14SA415: A Smoky Hill Phase Lodge. *The Kansas Anthropologist* 24:45–67.

Roper, Donna C., Robert J. Hoard, Robert J. Speakman, Michael D. Glascock, and Anne Cobry DiCosola
2007 Source Analysis of Central Plains Tradition Pottery Using Neutron Activation Analysis: Feasibility and First Results. *Plains Anthropologist* 52(203):325–335.

Roper, Donna C., Richard L. Josephs, and Margaret E. Beck
2010 Determining Provenance of Shell-Tempered Pottery from the Central Plains Using Petrography and Oxidation Analysis. *American Antiquity* 75(1):134–157.

Ross, Jorgina A.
1991 *Geologic Map of Kansas.* Map M-23. Kansas Geological Survey, University of Kansas, Lawrence.

Ryan, Shannon
2008 Chopped Stone Artifacts from 14RC410. In *Archaeological Investigations on a Portion of 14RC410, Rice County, Kansas: The Little River Archaeology Project*, edited by Donna C. Roper, pp. 176–245. Report to the City of Little River, Kansas. Coronado-Quivira Museum, Lyons, Kansas.

Rye, Owen
1981 *Pottery Technology*. Taraxacum, Washington, D.C.

Sampson, C. Garth
1988 *Stylistic Boundaries among Mobile Hunter-Foragers*. Smithsonian Institution Press, Washington, D.C.

Sassaman, Kenneth E.
1993 *Early Pottery in the Southeast: Tradition and Innovation in Cooking Technology*. University of Alabama Press, Tuscaloosa.
2010 *The Eastern Archaic Historicized.* AltaMira Press, Lanham, Maryland.

Sassaman, Kenneth E., and Donald H. Holly, Jr. (editors)
2011 *Hunter-Gatherer Archaeology as Historical Process*. Amerind Studies in Anthropology. University of Arizona Press, Tucson.

Schlanger, Sarah H.
1992 Recognizing Persistent Places in Anasazi Settlement Systems. In *Space, Time, and Archaeological Landscapes*, edited by Jacqueline Rossignol and LuAnn Wandsnider, pp. 91–112. Plenum Press, New York.

Schoewe, Walter H.
1949 The Geography of Kansas, Part II - Physical Geography. *Transactions of the Kansas Academy of Science* 52(3):261–333.

Shennan, Stephen
1978 Archaeological 'Cultures': An Empirical Investigation. In *The Spatial Organisation of Culture*, edited by Ian Hodder, pp. 113–139. University of Pittsburgh Press, Pittsburgh, Pennsylvania.

Sigstad, John S.
1969 Pottery. In *Two House Sites in the Central Plains: An Experiment in Archaeology*, edited by W. Raymond Wood, pp. 17–23. Memoir No. 6. *Plains Anthropologist* 14(44) pt.2.

Simon, Mary L.
2009 A Regional and Chronological Synthesis of Archaic Period Plant Use in the Midcontinent. In *Archaic Societies: Diversity and Complexity across the Midcontinent*, edited by Thomas E. Emerson, Dale L. McElrath, and Andrew C. Fortier, pp. 81–114. State University of New York Press, Albany.

Skibo, James M., and Michael B. Schiffer
2008 *People and Things: A Behavioral Approach to Material Culture*. Springer, Dordrecht, The Netherlands.

Smith, Bruce D.
1992 *Rivers of Change: Essays on Early Agriculture in Eastern North America*. Smithsonian Institution Press, Washington, D.C.

Smith, Holly C.
2002 *Southeast Kansas: A Region in Perspective*. Unpublished Master's thesis, Department of Anthropology, Wichita State University, Wichita, Kansas.

Smith, Robert E., Gordon R. Willey, and James C. Gifford
1960 The Type-Variety Concept as a Basis for the Analysis of Maya Pottery. *American Antiquity* 25:330–340.

Speakman, Robert J.
2010 *Ceramic Geography and the Social Formations of the Smoky Hill Phase, East-Central Kansas: Results of Instrumental Neutron Activation Analysis of Grit And Sand Tempered Pottery.* Report to the University of Kansas and Kansas State University. Smithsonian Museum Conservation Institute, Suitland, Maryland.

Stauffer, Richard L.
1957 A Saline County Site. *Kansas Anthropological Association Newsletter* 2(8):6–9.

Stein, C. Martin
2006 Kansas Lithic Resources. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 264–282. University Press of Kansas, Lawrence, in association with the Kansas State Historical Society.

Stephens, H.A.
1969 *Trees, Shrubs, and Woody Vines in Kansas*. University Press of Kansas, Lawrence.

Steponaitis, Vincas P.
1983 *Ceramics, Chronology, and Community Patterns: An Archaeological Study at Moundville*. Academic Press, New York.

Sterns, Frederick
1915 *The Archeology of Eastern Nebraska with Special Reference to the Culture of the Rectangular Earth Lodges.* Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge, Massachusetts.

Stoltman, James B.
2001 The Role of Petrography in the Study of Archaeological Ceramics. In *Earth Sciences and Archaeology*, edited by Paul Goldberg, Vance T. Holliday, and C. Reid Ferring, pp. 297–326. Kluwer Academic/Plenum Publishers, New York.

Stone, Glenn Davis
1996 *Settlement Ecology: The Social and Spatial Organization of Kofyar Agriculture*. Arizona Studies in Human Ecology. University of Arizona Press, Tucson.

Strong, William Duncan
1935 *An Introduction to Nebraska Archeology*. Miscellaneous Collections 93(10). Smithsonian Institution, Washington, D.C.

Sullivan, Lynne P., and S. Terry Childs
2003 *Curating Archaeological Collections: From the Field to the Repository*. Archaeologist's Toolkit No. 6. AltaMira Press, Walnut Creek, California.

Sundermeyer, Scott Anthony
2005 *Economic Specialization and Storage Pit Use at Crandall (14RC420), a Protohistoric Wichita Site of the Little River Focus in Rice County, Kansas*. Unpublished Master's thesis, Department of Anthropology, University of Oklahoma, Norman.

Swanton, John
1942 *Source Material on the History and Ethnology of the Caddo Indians*. Bulletin No. 132. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C. Reprinted 1996, University of Oklahoma Press, Norman.

Thompson, Victor D.
2010 The Rhythms of Space-Time and the Making of Monuments and Places During the Archaic. In *Trend, Tradition, and Turmoil: What Happened to the Southeastern Archaic?*, edited by David Hurst Thomas and Matthew C. Sanger, pp. 217–228. Anthropological Papers No. 93. American Museum of Natural History, New York.

Trautman, Milton
1963 Isotopes, Inc. Radiocarbon Measurements III. *Radiocarbon* 5(1):62–79.

Udden, Johan August
1900 *An Old Indian Village*. Lutheran Augustana Book Concern, Printers, Rock Island, Illinois.

Van Beek, Gus W., with Ora Van Beek
2008 *Glorious Mud!* Smithsonian Institution Scholarly Press, Washington, D.C.

Walker, Ernest G.
1992 *The Gowen Sites: Cultural Responses to Climatic Warming on the Northern Plains (7500–5000 B.P.)*. Mercury Series Paper No. 145. Archaeological Survey of Canada, Canadian Museum of Civilization, Ottawa.

Wedel, Waldo R.
1933 Preliminary Notes on the Archaeology of Medicine Valley in Southwestern Nebraska. *Nebraska History Magazine* 14(3):144–166.
1934a Minneapolis 1, A Prehistoric Village Site in Ottawa County, Kansas. *Nebraska History Magazine* 15(2):210–237.
1934b Contributions to the Archaeology of the Upper Republican Valley, Nebraska. *Nebraska History Magazine* 15(2):133–209.
1934c Appendix: Preliminary Classification for Nebraska and Kansas Cultures. *Nebraska History Magazine* 15(2):251–255.
1934d Salina 1: A Protohistoric Village Site in McPherson County, Kansas. *Nebraska History Magazine* 15(2):238–250.
1940a Culture Sequence in the Central Great Plains. In *Essays in Historical Anthropology of North America*, pp. 291–352. Miscellaneous Collections No. 100. Smithsonian Institution, Washington, D.C.
1940b Archeological Explorations in Western Kansas. In *Explorations and Field-Work of the Smithsonian Institution in 1939*, pp. 83–86. Publication No. 3586. Smithsonian Institution, Washington, D.C.
1959 *An Introduction to Kansas Archeology*. Bulletin No. 174. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
1961 *Prehistoric Man on the Great Plains*. University of Oklahoma Press, Norman.

Welch, Paul D., and C. Margaret Scarry
1995 Status-Relation Variation in Foodways in the Moundville Chiefdom. *American Antiquity* 60:397–419.

Wheat, Joe Ben, James C. Gifford, and William W. Wasley
1958 Ceramic Variety, Type Cluster, and Ceramic System in Southwestern Pottey Analysis. *American Antiquity* 24:34–47.

Whitbread, Ian K.
1986 The Characterization of Argillaceous Inclusions in Ceramic Thin Sections. *Archaeometry* 28:79–88.

Whiteford, G.L.
1937 *Prehistoric Indian Excavations in Saline County, Kansas*. Consolidated Printers, Salina, Kansas.
1941 *Indian Archaeology in Saline County, Kansas*. Consolidated Printers, Salina, Kansas.

Widga, Christopher C.
2006 *Bison, Bogs, and Big Bluestem: The Subsistence Ecology of Middle Holocene Hunter-Gatherers in the Eastern Great Plains*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Kansas, Lawrence.

Wilke, Philip J., Gayle F. Carlson, and John D. Reynolds
2002 The Late Prehistoric Percussion-Blade Industry of the Central Plains. *Central Plains Archeology* 9(1):1–23.

Will, George F., and George E. Hyde
1917 *Corn Among the Indians of the Upper Missouri*. University of Nebraska Press, Lincoln.

Willey, Gordon R., and Philip Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

Wilson, Peter J.
1988 *The Domestication of the Human Species*. Yale University Press, New Haven, Connecticut.

Witty, Thomas A., Jr.
1962 *Archeological Investigations of the Hell Creek Valley in the Wilson Reservoir, Russell and Lincoln Counties, Kansas*. Anthropological Series No. 1. Kansas State Historical Society, Topeka.

1968 Notes from the Editor. *Kansas Anthropological Association Newsletter* 14(1):7–8.
1971 K.A.A. Summer Dig, 1971. *Kansas Anthropological Association Newsletter* 17(1&2):25–26.
1974 K.A.A. Dig, 1973: The Minneapolis Site, One More Time. *Kansas Anthropological Association Newsletter* 19(5):1–5.

Wulfkuhle, Virginia
2010 Déjà Vu All Over Again: 2010 KAA Fall Fling. *Kansas Anthropological Association Newsletter* 22(4):8–10.

Zehnder, Jon P.
1998 *Relatationships Between Two Little River Focus Sites in McPherson and Rice Counties of Central Kansas Based on Excavated Lithic Debitage*. Unpublished Master's thesis, Department of Anthropology, Wichita State University, Wichita, Kansas.

Donna C. Roper
June 20, 1947–August 15, 2015

Donna C. Roper had a long and very productive career in archaeology, much of it focused on the prehistory and early Native history of the Great Plains and critical scientific methods of data collection and interpretation. Few people have devoted themselves so completely to archaeology, especially that of the Plains.

Donna Roper was born in Oneonta, New York. She earned a B.A. degree in history from Hartwich College in Oneonta. Pursuing degrees in anthropology with an emphasis in archaeology, she completed her M.A. at Indiana University-Bloomington in 1970 and her Ph.D. at the University of Missouri-Columbia in 1975.

Following receipt of her doctoral degree, Dr. Roper continued to work on archaeological projects for the University of Missouri until 1980 when she joined Gilbert/Commonwealth Inc. of Jackson, Michigan, as Senior Archaeologist and Project Manager, becoming a partner in Commonwealth Cultural Resources Group in 1988. She completed a wide range of compliance projects across the United States and gained a special appreciation for the Plains region. In 1991 Dr. Roper moved to Manhattan, Kansas, where she worked as an independent researcher and consultant associated with Kansas State University.

Dr. Roper was a 25-year member of the Kansas Anthropological Association. She served as Principal Investigator or Project Director for three Kansas Archeology Training Program field schools: Albert Bell site (14SD305) in 2002, Claussen site (14WB322) upper component in 2003, and Kansas Monument site (14RP1) in 2008. She regularly published major articles, as well as several book reviews, in *The Kansas Anthropologist*: An Apachean Pottery Vessel from Coal-Oil Canyon (Volume 17(2) for 1996); Non-Mound Schultz Phase Burials from the Elliott Site, Geary County, Kansas (Volume 21 for 2000); Five Smoky Hill Phase Houses in Saline and Ottawa Counties: The Whiteford Excavations 1934–1945 (Volume 22 for 2001); The 1970 Excavation at 14SA415: A Smoky Hill Phase Lodge (Volume 24 for 2003) with Harold Reed; Ceramic Period Components at the Claussen Site, 14WB322, Wabaunsee County, Kansas (Volume 26 for 2005); Smoky Hill Phase Settlement Patterns in the Salina Area (Volume 27 for 2006); and Thinking about Human Remains at the Elliott Site (Volume 29 for 2008).

Dr. Roper was active in the Plains Anthropological Society, Association of Professional Archaeologists of Kansas, and the Nebraska Association of Professional Archaeologists. She documented and interpreted Paleoindian, Archaic, Woodland, Late Prehistoric, and early Historic Native and Euroamerican remains and contributed to studies of settlement patterns, human ecology, mortuary behavior, earthlodges and earlier forms of Native lodging, lithics, ceramics, radiocarbon dating, and much more. She regularly shared her research at national and regional conferences and in more than 100 articles in archaeological and related journals, books, and monographs, not to mention nearly twice that many technical reports, both large and small. Roper took an active role in educating the public through many different media and occasionally teaching and guiding students at various regional universities.



Principal Investigator Donna Roper and Crew Chief Harold Reed at the Albert Bell site, Kansas Archeology Training Program Field School, June 2002. Photograph by Sharon Sage.

In 2015 Dr. Roper received the Distinguished Service Award from the Plains Anthropological Society and the William Duncan Strong Memorial Award from the Nebraska Association of Professional Archaeologists. She joined a select group of renowned archaeologists recognized for exemplary contributions to the profession.

Though much of her life was devoted to archaeology, Dr. Roper enjoyed her dogs, birding, photography, reading, music, and astronomy.

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