

PEOPLE OF THE PRAIRIE

A POSSIBLE CONNECTION TO THE DAVIS SITE CADDO

by

Harry J. Shafer

*"Archaeology must constantly explore new strategies for mining its artifacts for all that they are worth."
(Lechtman 1977:17).*

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TO THE DAVIS SITE CADDO

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TABLE OF CONTENTS

Introduction	1
Background	4
Part A: Making the Case for Prairie Caddo	10
Testing the Hypothesis	24
Importance of Radiocarbon Dates in Phase II Testing	30
Part B: Making the Case for the Davis Site as Prairie Caddo	30
Testing the Hypothesis	36
Temporal and Spatial Comparisons	38
Contested Hunting Grounds	40
Conclusions	40
Acknowledgments	42
References Cited	43

LIST OF FIGURES

1. Map showing the approximate geographic area proposed for the Prairie Caddo superimposed over ecoregions of central and east Texas	6
2. Examples of early Caddoan pottery and its distribution	12
3. Examples of metapodial beaming tools and their distribution	14
4. Examples of bone needles and their distribution	16
5. Examples of Bonham-Alba arrow points and their distribution	18
6. Examples of Gahagan bifaces and their distribution	20
7. Base-tang knife from Burial 52 at the Asa Warner site	40

LIST OF TABLES

1. Selected sites with early Caddoan pottery	11
2. Selected sites with metapodial beaming tools	13
3. Selected sites with bone needles	17
4. Selected sites with Bonham-Alba arrow points	19
5. Selected sites with Gahagan bifaces	21

INTRODUCTION

The central part of this study is to provide a research module for identifying and interpreting the Late Prehistoric material culture that occurs in central and east-central Texas from ca. A.D. 1000 to 1300. The study uses both the temporal and spatial patterning in certain highly diagnostic sets of material culture to hypothesize that Caddo groups occupied portions of central Texas prairies in Late Prehistoric times. The term “Prairie Caddo” is the cultural tag used as the reference to the prairie assemblage, and the reasoning behind this label is one of the main theses of the paper. The working hypothesis for this module is that the material culture in the prairie area is distinctive and can be distinguished from that of earlier and later constructs and from contemporary assemblages in adjacent geographic regions based on the technological styles and is more closely related to that of the George C. Davis site and other Caddoan assemblages than to either the Austin or Toyah constructs as currently defined (Jelks 1962). Tests for the hypothesis will be based on how to distinguish technological styles in material culture and on explaining how such styles originated and are used to establish social identity. This approach is extraordinary for Texas archeology in that the current space-time systematics (Austin and Toyah) are too restricted and cannot account for the proposed prairie assemblage in central Texas. It echoes concerns expressed by Ellis et al. (1995) and Collins (1998:57) regarding the restrictive “Central Texas” label. It also supports observations made by Brown (1987:44-27-31) with regards to a possible early Caddo presence at Area B of the McDonald site at Aquilla Reservoir. The proposed resolution is to apply a nontypological approach using technological style to explain the presence of Caddoan material culture in the central Texas prairies. Patterning and styles of material culture do not just happen. There are underlying cultural processes of behavior that lead to material culture patterning and style. The study hinges on the use of *technological style* (Lechtman 1977; Lemonnier 1986; Hegmon 1998) as opposed to artifact type to establish the social identity for the central Texas Caddoan assemblages.

The idea that the Late Prehistoric peoples who occupied the area of the Middle Brazos and its tributaries—especially the Leon and Bosque Rivers and their tributaries—might be Caddo came from my realization that there was an assemblage in the Late Prehistoric period in central Texas that did not fit the currently applied Toyah and Austin systematics. It appears that the artifact assemblage in question is partly interdigitated spatially and temporally with Austin and Toyah diagnostics in the western portion, especially along the Balcones Edge. I suspect that the prairie assemblage will fall chronologically between Austin and Toyah in cases where the component is isolated. The arrow points did not compare well in my opinion with Perdiz as the type is now applied to pointed-stem arrow points in west-central Texas (Creel 1990:90-93; Johnson 1989, 1994:66-87; Ricklis and Collins 1994) and south Texas (Black 1986; Hester and Parker 1970; Ricklis 1995), and the ceramics are often identified as early Caddoan types. Furthermore, there appeared to be ties in this central Texas assemblage with the George C. Davis site, especially with regards to the ceramics, arrow point styles, and Gahagan bifaces. These similarities suggested to me that a possible connection between the two was perhaps more than merely the result of trade and exchange.

The notion that to be Caddo, people must have lived in the Piney Woods in villages composed of beehive-shaped houses, made distinctive pottery, and practiced corn agriculture is ingrained in the minds of Texas archeologists. This image of “Caddo” comes from archeology folklore and is based largely on historic accounts of the Hasinai Caddo. Right or wrong, this folk perspective of Caddo precludes alternative adaptations that were more hunter-gatherer than agricultural. To hold “Caddo” to such a narrow perspective makes it difficult to identify their ancestral beginnings or peripheral cousins. My conception of Caddo is based more on the material correlates of underlying common behaviors that override the more-surface expressions of material culture that may be the result of adapting to resources at hand, or lack thereof. Corn agriculture was essentially confined to that area of east Texas that had natural resources to support growing populations. Central Texas, however, probably supported a resident population that may have supplemented hunting and gathering with

agriculture rather than the other way around, relying on agriculture. These subsistence choices would not make them any less “Caddo.”

I had acquired hands-on knowledge of the material assemblages and raw materials from central Texas at TARL working with Dee Ann Story and had handled collections from the Urbankte (41CV26), Grimes-Houy midden (41CV32), Baylor (41ML35), and other sites in the Leon River and Bosque River areas that contained an assemblage of material that struck me as being different from the standard definitions of what constituted Austin and Toyah assemblages. Analysis of the George C. Davis site lithics alerted me to the fact that they have strong technological, stylistic, and raw material similarities to this assemblage in central Texas and that the chert sources for the Davis site clearly lay in that direction. I had always felt there were more than casual relationships between the two areas. I had seen undeniable examples of early Caddoan pottery in numerous central Texas sites (Grimes Houy midden [41CV32], Urbankte [41CV26], Baylor [41ML35], Asa Warner [41ML46], and Chupik [41ML39], among others), and this subsequently has been confirmed through NAA analysis (Darrell Creel, personal communication 2004). Furthermore, my archeological field experiences and network associations that provided new and different ideas in the American Southwest and Mesoamerica changed my perspectives as well. The Colha experience, which I shared with Thomas Hester, opened my mind to technological style in lithics and showed me firsthand how material culture can yield incredible information about complex societies. The technological style of the Late Pre-Classic and Classic Maya flint workers at Colha is unique in the Americas. I once dubbed the style “the Colha school of flintknapping” at a lecture at UT-Austin to emphasize there is more than one way to make a biface. Also, my Mimbres and El Paso experiences opened my mind to technological style in ceramics, architecture, and mortuary behavior and showed me just how sensitive are the processes that lead to changes in material style. In the Mimbres case, it was patently clear that parallel changes in material culture followed a common underlying theme that was distinctively Mimbres, and which distinguished them from all other cultures in the American Southwest. I think the same can be said about what is distinctively Caddo.

I also took another look at the George C. Davis site, given my Mesoamerican and Southwest perspectives, not as a self-sustaining settlement but as a regional ceremonial center that served as a magnet to attract, and perhaps to maintain some jurisdiction over, outlier villagers that sustained the ceremonial center. Story’s research efforts (Kegley 1969) failed to locate outlier villages in proximity to the Davis site, and to my knowledge, none have been found to this day (Story 2000). Obviously, this was a very important center as shown by the labor-intensive effort of mound construction and elite tombs that received finished material items from central Texas and elsewhere. The Davis site was strategically located on a fertile terrace at the eastern boundary of the prairies and on the boundary between the Austroriparian and Texan biotic provinces. It also drew resources from the Balconian province to the west, as well as lithic resources from the Catahoula Formation to the south (Shafer 1973). It served as a conduit and magnet for the movement for prestige goods to and from other early Caddoan mound centers to the north and east such as Mounds Plantation and Gahagan in Louisiana, Bentsen-Clark on the Red River, Crenshaw and Mineral Springs in Arkansas, and possibly even Spiro in Oklahoma. Artifacts of exotic resources from the Ouachita Mountains, Midwest, and points east also made their way to the Davis site. Some kind of connection with central Texas was apparent in the lithic technology, but understanding the mechanisms of the connection led to the realization that the people responsible for the central Texas assemblage may have indeed been Caddoan peoples. This idea left a lot of things hanging that need explanations beyond what Texas archeologists have ventured. Foremost is an explanation for the Davis site itself.

The standard assumption is that the Davis site was the seat for an early Caddoan chiefdom (Perttula 2001). It certainly has all of the hallmarks of a stratified social organization, with the platform mounds and special mortuary mound of shaft tombs. The mound site, associated village, and array of exotic and material items are situated on the eastern fringes of the prairie and on the southwestern boundaries of the Southeastern Culture area and the Mississippian phenomenon

(Pauketat 2004:43, 133). Powerful political entities, like malignancies, send their tentacles into the hinterlands to manifest their control over resources, both natural and human. Was this the case with the Davis site situated at the boundary between the eastern woodlands and prairies of the interior coastal plain? Were affiliated groups occupying the prairies and providing goods processed from prairie resources?

Were parts of central Texas a territory that, once claimed, people periodically moved back and forth through space to fulfill their subsistence needs as Nelson and Anyon (1996) have proposed for southern New Mexico during the Mimbres Postclassic? Archeologists may see this as a possible case for abandonment and reoccupation, when in fact the territory may never really have been abandoned. If the latter, were these groups once affiliated with the Davis site only to become separate prairie groups following the economic shifts after A.D. 1300 surrounding the appearance of the bison? Styles, after all, change with stimulus. These are questions that go beyond this module but are relevant to the broader issues of the material correlates of territorial behavior and technological style.

Before any of these questions could be explored, I needed to identify something in the material culture that could be convincingly Caddo technological style. That is, I needed to identify a series of items or sets of items that are demonstrably of Caddo origin that were being made and used in central Texas. Architecture would be an excellent choice, but evidence for architecture is fleeting at best in central Texas (Shafer et al. 2004). That type of evidence does exist in the prairie area with sites such as Hurricane Hill (Fields 1995; Perttula 1999), 41HP175 (Fields 1995), Jewett Mine (Gadus et al. 2002), Bird Point Island (Bruseth and Martin 1987), and Cobb-Pool (Peter and McGregor 1988). Other possible clues seemed to be deer metapodial beamers and early Caddoan pottery. Beamers are never common in any one site, although late Caddoan sites such as Deshazo and A. C. Saunders are exceptions, probably due to the extensive sampling and good bone preservation. The next step was to look for beaming tools and find out what occurred with them. Bonham-Alba arrow points and early Caddoan pottery were two artifact classes that seemed to be likely candidates, and Gahagan bifaces, while not yet reported with beaming tools, did consistently occur with Bonham-Alba arrow points. When I first made preliminary plots of the geographic distribution of beaming tools, Gahagan bifaces, Bonham-Alba arrow points, and early Caddoan pottery, the overlap formed an interesting pattern extending from the Neches River to the Balcones Edge (Shafer 2003b). This did not correlate with any geographic distribution map for either the Austin or Toyah assemblages, as originally defined by Jelks within the Central Texas Aspect of Suhm et al. (1954:Figure 5) and currently used (Prewitt 1981, 1985).

The idea that Caddoan assemblages occur within the area defined for the prairie Caddo is not new. Alex Krieger was well aware of early Caddoan pottery in central Texas and even classified the Chupik site as an Alto focus component (Newell and Krieger 1949:196). At the Fourth Conference on Caddoan Archaeology (Davis 1961), a statement attributed to Edward B. Jelks (in Davis 1961:26, 27) reads as follows:

There is a band of material between the Brazos and Trinity Rivers, between the latitudes of Waco and Austin. A few sites have sherds of Alto Focus type, Alba arrowpoints, and Copena points or knives. Other sites have numerous Frankston focus sherds and associated artifacts; and still others have sherds more closely resembling Sanders Focus type than any others. Krieger calls the Chupik site near Waco, where Frank H. Watt has made extensive collections, primarily an Alto Focus component, but there are sherds and other artifacts of the Frankston Focus there too, as well as sherds resembling Sanders Focus types. The Alto Focus types at Chupik include Weches, Dunkin, Pennington, Crockett, Holly, and Hickory.

I was especially encouraged that Story (2000) continues to identify Chupik as an Alto phase settlement.

Caddoan material culture was later ignored when the constructs Austin and Toyah foci were defined by Jelks (1962) for this portion of central Texas, and the status of Caddo pottery was relegated to trade ware. Current systematics used in central Texas archeology are not satisfactory in segregating variability in Late Prehistoric archeological assemblages and pose serious constraints for archeological interpretation. Foremost of these are the boundaries defining central Texas (Collins 1995:Figure 1; Prewitt 1981:Figure 2) versus the east Texas Caddoan area (Perttula 1995:Figure 1; Webb 1958:Figure 1), which unconsciously or consciously force archeologists to think in terms of these arbitrary boundaries for a lack of robust alternatives. The gap between the two defined cultural units of central and east Texas is a large, wide-open savannah-prairie transected by the Brazos and Trinity Rivers (Perttula 1995:Figure 1). To open minds for alternative interpretations, these boundaries need to be erased. The same can be said with the Late Prehistoric constructs Austin and Toyah when rigorously applied to the area in question. This is not to say that these concepts are no longer useful throughout central Texas, but in the prairies their either/or applications obscure variability.

Further evidence for the constraints imposed by the Austin-Toyah systematics can be found in the problem that confronted researchers at Aquilla Reservoir (Brown 1987:44-27 through 44-32). Area B at the McDonald site yielded an assemblage consisting of Alba-like arrow points and early Caddoan pottery. Brown recognized the early Caddo similarity in the assemblage but ended up assigning this assemblage to early Toyah. Brown was forced to bend the Toyah label backwards to fit the radiocarbon date of A.D. 1170.

BACKGROUND

In making the case for the Prairie Caddo model and its material components, it is essential to provide background information. Foremost is the concept of technological style. This concept is defined, and how and why it is used in place of current typological constructs is explained. Also, the geographic region incorporated in the study is defined, and the current systematics and the problematic constructs Austin and Toyah are discussed. The body of the report consists of two main parts. The first makes the case that the people of the prairie were Caddo affiliated with the George C. Davis site, and the second argues that the George C. Davis site Caddo were affiliated with the people of the prairie. These topics are presented as hypotheses and supported by extant data and my interpretation of that data. Suggestions and directions for testing these hypotheses are offered to provide substance to the module.

Part A presents the hypothesis that the material culture of the people of the prairie more closely resembles that of the Davis site Caddo than any other defined cultural construct. The hypothesis is based on the geographic and temporal distributions of early Caddoan pottery, Gahagan bifaces, Bonham-Alba arrow points, and deer metapodial beamers. The geographic and temporal distributions of each of these material categories are discussed. This section also incorporates critical variables of technological style and style recognition for specific categories of material culture. The Prairie Caddo assemblage is compared to select examples from adjacent regions to the west, north, and south to illustrate irregularities in technological styles. When compared, such irregularities can highlight sociocultural differences that have escaped previous observations (Lemonnier 1986).

In Part B, evidence from the George C. Davis (Davis) site is shown that supports regional connections to central Texas. Again, technological style of material culture is the critical variable on which the connection is based. The Davis site was a major regional early Caddoan civic-ceremonial center that would have attracted visitors from adjacent and distant regions. Evidence for central Texas connections is presented, and analytical approaches toward demonstrating large gatherings, including people from central Texas, are suggested. A final section is devoted to the applications of the Prairie Caddo module and its possible implications for interpreting Late Prehistoric archeology

and cultural dynamics in central and east-central Texas. Room is left open for considering territorial conflicts along the Balcones Edge and its archeological correlates.

The artifact type as defined by Krieger (1944) is an analytical tool that is extremely well worn from use in Texas archeology. It still holds a very important place in the tool box, and archeologists need to know current typologies as with any analytical device. It is time to take the next step, however, and add new analytical tools to move beyond the constraints of artifact type and current systematics in order to open the mental door for the exploration of new themes that rely on the notion of technological style. Among the themes being explored in North American archeology are social identity (Hegmon 1998; Jenkins 1996; Mills 2004) and feasting behavior (Dietler and Hayden 2001a; Hayden 2001). While these specific themes are not the object of this paper, the theoretical foundation for these themes, technological style and how it can be applied to the archeological record in central and east-central Texas, lies at the heart of this module. Understanding technological style and the associated cultural processes that involve the pertinent technological systems and resultant expressions in material culture styles and patterning are the keys to defining what I am proposing as the southern Prairie Caddo model.

As noted above, the proposed southern Prairie Caddo model is based on the geographic distributions of the artifacts that compose the assemblage and are consistently associated together, although not all are recovered from every site. Artifacts comprising the prairie area assemblage include early Caddoan pottery defined by the George C. Davis site assemblage, Gahagan bifaces, Bonham-Alba arrow points, and deer metapodial beamers. Previous researchers have largely concluded that the ceramics represent trade goods to unaffiliated central Texas groups (Jelks 1962:88). In contrast, it is argued that this material culture set was produced by Caddoan groups and can be used to propose a permanent Caddo presence in central Texas. This argument is based on the notions of technological styles, which are the result of enculturation and not casual contact (Clark 2004) and have their origin in Caddo culture. Arguable prehistoric Caddoan groups occupied the central Brazos valley and its tributaries by A.D. 1100 if not earlier, based on crossdating artifact styles from the George C. Davis site (Story 2000:Figure 3). Terminal dates are ca. A.D. 1250–1300, based on crossdating and extant dates from the assemblage in central Texas. It is also proposed that the Prairie Caddo were materially linked to the George C. Davis site in Cherokee County.¹

The geographic area for the Prairie Caddo is shown in Figure 1 and is divided into southern and northern components based on differences in ceramics and diagnostic lithics (see also Brown 1987:44-31). The southern Prairie Caddo area extends from Cherokee County on the east to Williamson, Bell, Coryell, Hamilton, Hill, and Travis Counties on the north and west. It encompasses portions of the central Trinity, Navasota, Little Brazos, and central Brazos valleys, including tributaries Bosque, Leon, San Gabriel, and Little Rivers and Aquilla and Tawakoni Creeks, with the Colorado River in Travis County and Yegua Creek possibly being on the southwestern and southern peripheries, respectively. The area includes portions of the Interior Coastal Plains, Blackland and associated prairies, and the northeastern fringe of the Edwards Plateau defined here as the Balcones Edge. The southern margin of the southern Prairie Caddo is defined by the distribution of Bonham-Alba arrow points, Gahagan knives, and early Caddo pottery. Sandy paste ware may dominate in certain sites, such as those in the Gibbons Creek Mine area (Rogers 1995), but this may merely be a product of local clays and locally produced culinary ware.

¹Middle Caddoan pottery, including elbow pipes, recovered from Ament (Miller and Jelks 1952), Grimes Houy midden (TARL collections), Asa Warner, and sites at Fort Hood, for example, indicate that the prairie people did not disappear as the Davis site waned, but rather remained connected to the Caddoan heartland at least to A.D. 1300 if not later. The emphasis on early Caddoan Davis site connections for the prairie area is used to make the case for Caddo presence in central Texas.

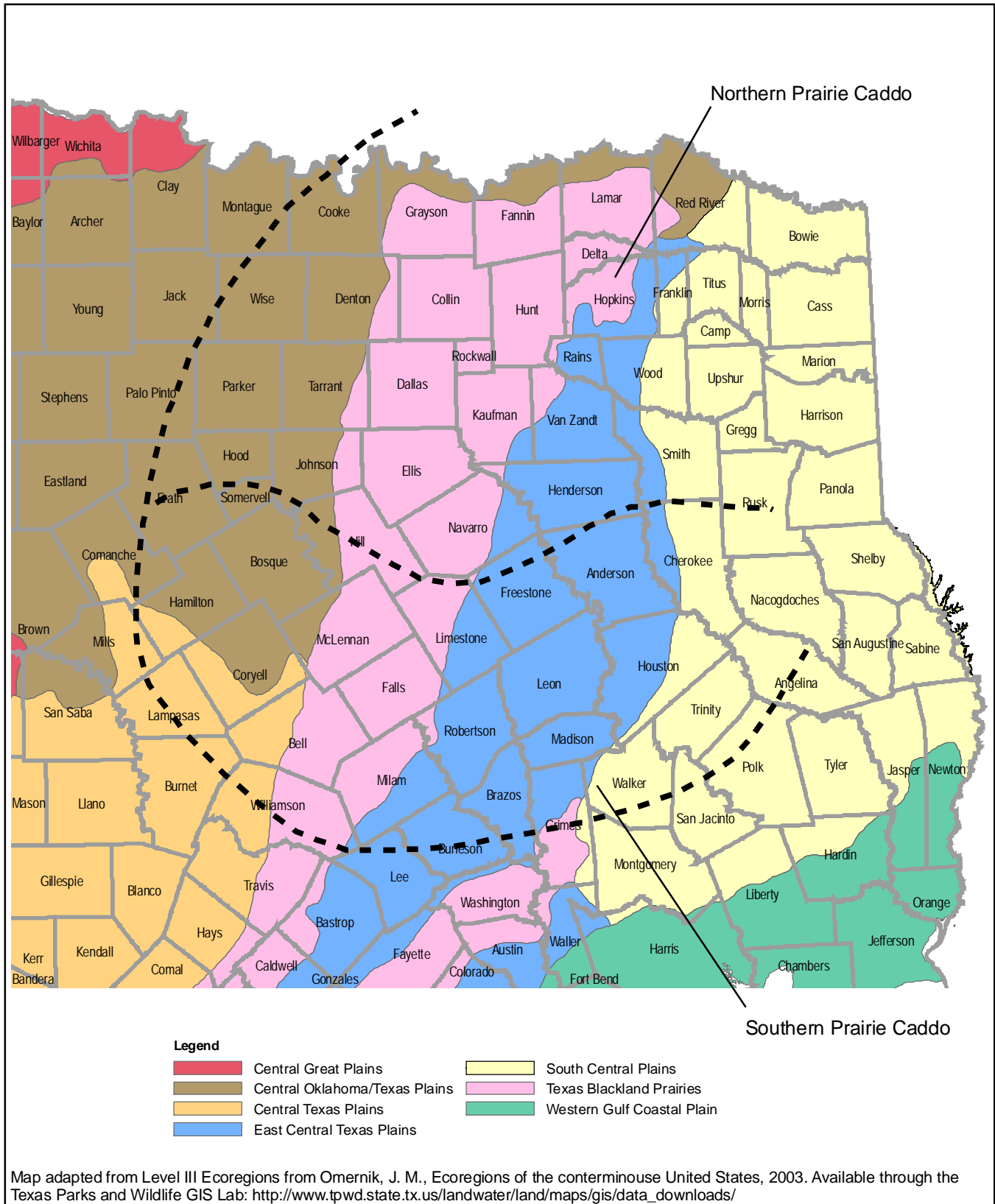


Figure 1. Map showing the approximate geographic area proposed for the Prairie Caddo superimposed over ecoregions of central and east Texas.

The southern Prairie Caddo area does not include the upper Sulphur, upper Sabine, and upper Trinity systems in which the research areas of Cooper Lake, Mountain Creek Lake (Lake Joe Pool), and Richland Chambers Reservoir occur. These localities are encompassed in the northern Prairie Caddo area based on their own style of material culture that does not include Gahagan bifaces (see Figure 1) but does include early Caddoan pottery associated with the Sanders phase (Brown 1987: 44-31), Friley and Steiner arrow points, and metapodial beamers. The geographic distinction between the proposed northern and southern Prairie Caddo components is gray with considerable overlap in the distributions of arrow point types Bonham-Alba, Steiner, and Friley, and Sanders site and Davis site ceramics. Jewett Mine in Limestone and Freestone Counties is an example. The Jewett Mine project area is drained by tributaries of both the Brazos system (Navasota River and Lambs Creek) and Buffalo Creek and the Trinity system. Sites in the Jewett Mine district share attributes of both northern and southern Prairie Caddo.

The strongest evidence for the proposed southern Prairie Caddo comes from the central Brazos and its tributaries, the Bosque, Leon, and Navasota Rivers and their tributaries. The Balcones Edge of western Bell, Coryell, Williamson, and possibly Travis Counties very likely interdigitated with non-Caddo groups, and in my opinion probably consisted of contested territories. In other words, a permanent occupation is proposed for portions of the central Brazos valley with intermittent and interdigitated Caddo presence in the peripheries to the west and south. Admittedly, confirming this model of Caddoan presence is challenging, especially if only typological constructs are employed. For that reason, I looked beyond typology to technological style in material culture.

Data for defining the geographic distribution of each item in the material set were gleaned from site reports from the area defined in Figure 1 and its periphery and extant collections, both privately held and others housed at the Texas Archeological Research Laboratory and Brazos Valley Museum of Natural History. The author's own personal experience with the archeology in the area in question also weighed heavily in selecting collections data.

Technological style as articulated by Lechtman (1977) and others (Dobres and Hoffman 1994; Gero 1989; Hegmon 1998; Lemonnier 1986; Mills 2004; also see Weissner [1983] and Wobst [1977] for other pertinent discussions on the subject of style in archeology) focuses on the knowledge, skill, and intent behind human behavior and the resultant material expression of that behavior (Lechtman 1977:4). Human behavior is learned; the source of knowledge provides certain constraints and conditions on the actors within that culture who produce a material product. That behavioral product and its inherent messages communicate to knowledgeable recipients in the form of codes and the information they convey (Lechtman 1977:16, 17). Technological style has been defined as hierarchical (Hegmon 1998). Perhaps a better term is vertical integration. For example, the style of processing cotton for weaving, the style of weaving, the style of the garment and its design, the style of ritual, and the prescription in the execution of the ritual in which the garment is displayed all constitute layers of technological style.

Technological style is a powerful analytical tool because it can establish material correlates of enculturation (Clark 2004) and provide an opportunity to study the underlying and enduring material correlates of social identity. It is in the domestic arena where enculturation is learned through instruction and imitation. These material correlates of enculturation are precisely what I am using to establish Prairie Caddo identity. Technological style will be used to define and explain the material set consisting of the four artifact classes.

The craft of deer hide preparation using beaming tools is an excellent example of technological style. Metapodial beamers have been reported from several Caddoan components in eastern Texas (see Henderson 1995), and the use of metapodial beamers was incorporated into a Caddoan technological style of deer hide processing.

A series of actions is required to produce a technological style. These actions can be viewed systemically and form a *technological system*. A technological system for a particular technological style is the linear sequence of actions that converts raw material to a finished form. It follows a cognitive pattern for a particular technological style and is the systemic progression of an item through its technological process. Biface reduction systems, ceramic production, and basket making are cases in point. The technological system involving the production of a biface has been detailed in numerous flow charts for Pedernales, Clovis, and many other examples. W. H. Holmes (1894) was the first archeologist to graphically illustrate this process, which became lost in the minds of cultural historical archeologists through much of the twentieth century, only to be revived when the experimental contributions of Don Crabtree, Erett Callahan, Francois Bordes, J. B. Sollberger, and others were applied by archeologists. The trajectory is only part of the overall system, however. The system includes tools used (hammerstones, punches, billets, edge abraders, and pressure tools) and all products, failures, debitage, and finished items. Lithics are easy candidates for such flow charts since they are always preserved (Goode 2002:30–38; Shafer 1973:73–82). But the other components—punches, billets, and pressure tools—are not always preserved or identified as components of the biface technological system. They are inferred on the basis of the diagnostic attributes on the debitage (lipped striking platforms) and biface failures. These attributes can be replicated from experimental studies.

But what if the products are perishable? Beaming tools were used to remove hair from artiodactyl skins following a particular technological style. I assume it was pliable skins, but the ultimate use may have been a style of tailored skin clothing. Items in the technological system to produce tailored clothing might include bone needles and sinew. Beaming tools may be the only material trace left of the technological system used to produce fine deer skin, and bone needles the only material trace of tailored clothing that fit the technological style worn by Caddo men and women (Griffith 1954; Newcomb 1961:291, 292). Dress is one of the most visible products of technological style in preindustrial societies that distinguish one group from another. The technological system for deer skin clothing starts with the procurement of the artiodactyls. Conditions of preservation will limit the range of technological styles that may be detectable.

The prairies of central Texas and the sheltered canyons of the Balcones Edge may have been the preferred places where artiodactyls were procured by the Prairie Caddo. Perhaps, and I speculate here, the Balcones Edge served as intermittent hunting grounds where deer populations were less affected by human predation compared to the Caddo heartland. The degree of sedentism has an impact on larger ungulates' behavior and hunting stress. Historic Caddo use of the prairie area for hunting grounds is documented (Perttula 1992:26). In virtually all faunal reports examined for this study, deer-sized artiodactyls dominate. The extensive exploitation of deer in the more heavily populated east Texas could have reduced deer populations; hunting territories may have expanded to prairies and the Balcones Edge. Extensive evidence for butchering is evident in the form of split and splintered bones clearly showing, as would be expected, that deer constituted a significant source of meat protein. Deer hides would be a direct benefit of this subsistence exploitation. Overrepresentation of metapodials in an otherwise smashed faunal assemblage may represent evidence for salvaging metapodials for the use of beamers.

The question of social identity as defined on the basis of the archeological record requires some explanation. Without a doubt this concept has problems when applied liberally (Boyd 2001). The notion of social identity is currently receiving considerable attention in the American Southwest, especially in migration studies and defining social boundaries (Clark 2004; Mills 2004). Social identity has not been widely applied to archeological remains in Texas except for broad applications using a direct historical approach (e.g., for the Caddo, Suhm et al. 1954, among others; Wichita, Bell et al. 1967; Karankawa, Ricklis 1996; Atakapa, Aten 1983, Shafer et al. 1975; Jumano, Kelley 1986, among others). Every Texas archeologist knows (or should know) what generic Caddoan pottery looks like, and every coastal archeologist knows (or should know) what Rockport Black-on-gray pottery looks

like. But Texas archeologists have a challenge when it comes to placing social identity on prehistoric remains. While it helps to have a historic reference, it becomes critical to identify the technological styles behind the traditions, especially when the material patterning exceeds the geographic range of the known historical group or is sealed in time. The approach to defining social identity in this study is based on multitiered sets of technological styles, which when articulated form a material pattern that is accepted as Caddo elsewhere. The identification will be based both on archeological and ethnographic sources and the geographic distribution of material culture known to be of Caddoan origin or style. To clarify, I am hypothesizing that the people who occupied central Texas ca. A.D. 1000–1300 were Caddo. Certain characteristics of their material culture, however, may appear to have a non-Caddoan flavor (Bonham-Alba points, for example, compared to Alba elsewhere) due to the fact that they were adapted to the utilization of prairie resources as opposed to those of the eastern woodlands.

Applying the notion of feasting behavior may seem a bit strange for Texas archeologists working in central Texas, but feasting is a common practice cross-culturally associated with an array of public events structured around ceremonial occasions, marriages, funerals, athletic competition, political inaugurations, and so forth. Feasting was a common event among Texas hunters and gatherers (Newcomb 1961:55–56, 79–81) as well as agricultural groups, including the Caddo (Berlandier 1969:94–95; Foster 1998:238; Griffith 1954:78–81). Feasting occurs at every level of social integration, from the extended family to the community and pan-community gatherings, and is especially prevalent in tribal and chiefdom-level societies (Dietler and Hayden 2001a, 2001b; Hayden 2001). Display of costuming and exchange of material culture are concomitant with feasting, and specific classes of material culture such as special pottery vessels to serve large groups may have been made just for feasts. Feasts associated with ceremonies at the George C. Davis site may have attracted people of the prairie because such events provided stimulus and mechanisms for style display and material exchange. The social environment that may have stimulated production and patterning in certain kinds of material culture was centered at the George C. Davis site (Story 1997). But simply saying that feasting happened at the Davis site does not make it so. It has to be demonstrated.

What are the archeological correlates for feasting behavior? Southwest archeologists have tackled this problem aggressively lately (Mills 2004), and I believe there are material traces of such behavior at Davis. An inordinate representation of certain species (deer, jackrabbits, or fish) might be used to make the case. But faunal remains are not preserved at the Davis site except in unusual circumstances (Thurmond and Kleinschmidt 1979) and are probably not an ideal material class to test the feasting assumption. Large vessels used to cook, serve, and brew beverages for feasts might be a feasting indicator. One proposed method to define a feasting assemblage in ceramics at the Davis site is to examine a statistical sample of rim sherds of early Caddoan pottery (e.g., Holly Fine Engraved, Weches Fingernail Impressed, Crockett Curvilinear Incised, or Pennington Punctated-Incised) to determine vessel size and define a ceramic assemblage associated with feasting behavior. The sherd samples from around Mound A from the WPA excavations and Feature 193-1 are good candidates for such a vessel size study. Visibly, some vessels in these type classes from the Davis site are impressively large and are likely candidates for vessels used to serve large social gatherings (James Brown, personal communication 1998). Vessel size is one material correlate associated with feasting behavior (Van Keuren 2004). This Davis site data would then be compared to the ceramic assemblage from a known early Caddoan hamlet where periodic feasting would not be expected. Subsistence rather than ceremony would be a primary function of an extended-family-sized hamlet. Early Caddoan vessel rims from Prairie Caddo sites could be compared to the resulting data to see how they conform to the size distribution. Inordinately large vessels should be in assemblages that included pots used in preparing and serving feasts. My prediction is that Pennington, Weches, and other jar forms would be smaller in central Texas campsites and would not include larger vessels such as those found at the Davis site.

Another method of examining technological style in ceramics is to look for the presence of fine engraved pottery in central Texas collections. Central Texas sites are mostly small campsites that were probably short-term hunting and gathering localities along streams, in side drainages, and in rockshelters. The absence of fine engraved pottery would be expected in small hunting camps. Ceramics, if they occur at all, would be put to practical uses. A preponderance of plain jars or those embellished with wet-paste decorations for use around the hearth would be expected. Larger villages such as Asa Warner, Urbankte, Chupik, and McGuire's Garden have yielded sherds from a variety of vessels in both form and decoration. The greatest variety of ceramics occurred at the George C. Davis site, the proposed site for public feasting, rituals, and other events. Here, as the record shows, some vessels such as Holly Fine Engraved were elaborately decorated with presentational or emblematic styles for uses in a public arena (Brewington et al. 1995:168; Wobst 1977). This does not preclude vessels moving from the public to private arena as clearly demonstrated with the contextual and use-wear data for Mimbres Black-on-white (Lyle 1996; Shafer 2003a:190), a presentational ware if there ever was one. In other words, I would anticipate that ceramics would be different between villages or hunting camps and a ceremonial center because the technological style of use was different. Vessels from villages and hunting camps in the prairies, regardless of decorative style, would more likely be used for domestic purposes; hence jars should predominate. The predominance of jars over engraved vessels was the pattern at 41MX5, a small late Caddoan hamlet in Morris County (Brewington et al. 1995). Although 41MX5 is significantly later in time, I would expect the social and functional contexts that dictated ceramic embellishment to be much the same. Furthermore, to bolster the argument that vessels were moving from ceremonial centers (e.g., Davis site) to outlying settlements, items used in pottery manufacture, such as pot-polishing stones, would not be expected in the outlying settlements.

Completing this research module is a section on material culture analysis. Reference to current typology will be implicit in identifying the context of the assemblage but not the focus of the analysis. Analysis will not focus on the customary type descriptions, however, but rather on technological styles and technological systems. Excellent examples of technological styles for lithic technological systems have been recognized among the Clovis flintknappers in North America (Collins 1999:46) and among the Maya chertworkers at Colha, Belize (Shafer 1985). In each case, the chertworkers used specific and recognizable technological styles for producing Clovis points and Maya chipped stone axes, respectively. In other words, there is more than one approach to making a biface. An excellent example for technological style in ceramics can be seen in the Mimbres Black-on-white tradition. Mimbres potters took a brownware body and applied a white kaolin slip canvas for the manganese/iron compound paint (Shafer 2003a:174–193), which fired to a striking black-on-white finish. The technological style remained remarkably stable for almost 500 years, albeit with rather rapid evolution in stylistic motifs. This deeply enculturated tradition contrasted sharply to the adjacent Hohokam Red-on-buff, Cibola Whiteware, and Jornada brownware technological traditions.

The protocol is directed at material cultural analysis recovered from Late Prehistoric sites in central Texas. The guidelines are designed to identify the components of the Prairie Caddo assemblage. A crucial element of this protocol is to focus on the material culture and the technological styles behind their production and use them to establish the social identity of the archeological material. Hopefully, the Prairie Caddo assemblage will be documented in a variety of locations and settings that would provide a sense of variability in the settlement and subsistence patterns, resource procurement on the periphery of east Texas, and role as a buffer for the George C. Davis civic-ceremonial center with which the Prairie Caddo were affiliated.

PART A: MAKING THE CASE FOR PRAIRIE CADDO

The objective of this section is to create a material culture model for the central Texas prairies that links the Prairie Caddo with the Caddo. The material evidence is presented first, followed by

suggestions as to how the model can be tested. The requirements for the model call for showing how the material culture assemblages in central Texas are affiliated with the Davis site but not to groups to the west and south. The strength of the model will lie on the distribution into central Texas of technological styles of material culture that occur in known Caddoan sites. These material items are early Caddoan pottery, deer metapodial beamers, Gahagan bifaces, and Bonham-Alba arrow points. Distribution maps will show these items do not occur as a group in the regions to the west and south.

Early Caddoan pottery has been recognized in central Texas for nearly a century (Figure 2; Table 1). Watt (1953) brought attention to this fact, as did Krieger (Newell and Krieger 1949:196), Jelks (1962), and Story (2000). The ceramics never occur in frequencies comparable to Caddoan sites in the heartland but are frequent enough that they may represent a significant importation of early Caddoan vessels into central Texas. Early Caddoan types such as Weches Fingernail Impressed (Story and Shafer 1965; Watt 1953), Pennington Punctated-Incised (Watt 1953), Hickory Engraved (Jelks 1962; Watt 1953), and Holly Fine Engraved (Miller and Jelks 1952; Watt 1953, 1956) occur in sites in the Brazos valley and along the Balcones Edge. Ceramics were recovered from probable village sites along the major stream terraces (Brazos and Leon Rivers) and in upland settings along tributary creeks in the Balcones Edge.

While I have not actually examined very many early Caddoan sherds to determine vessel form, most of the sherds that I have seen from the Baylor (41ML35) and Urbankte (41CV26) sites, among others, appear to be from small jars (Weches, Pennington), although bowls (Holly Fine Engraved) and bottles (Hickory Engraved; Jelks 1962) would suggest most vessel forms found at the George C. Davis site are represented. All examples were recovered from campsite midden deposits suggesting that the vessels were relegated to domestic uses.

Table 1. Selected sites with early Caddoan pottery

Site/Locality	Site Number	County	Type	Reference
Penny Winkle	41BL23	Bell	Dunkin	Shafer et al. 1964:Figure 15I
Penny Winkle	41BL23	Bell	Kiam	Shafer et al. 1964:Figure 15J
–	41BU16	Burleson	unidentified	Roemer and Carlson 1987:86-93
Urbankte	41CV26	Coryell	Pennington	Shafer 2003b; Figure 2, this report
Urbankte	41CV26	Coryell	Davis/Kiam	Shafer 2003b; Figure 2, this report
Fort Hood	41CV92	Coryell	untyped	Perttula et al. 2003:Figure 8
McGuire's Garden	41FT425	Freestone	Holly	Gadus et al. 2002:Figure 50C
–	41GM281	Grimes	Kiam	Rogers 1995:Figure 34
–	41GM281	Grimes	Kiam?	Rogers 1995:Figure 36
Kyle	41HI1	Hill	Hickory	Jelks 1962:Figure 24
McDonald	41HI105	Hill	Kiam	Brown et al. 1987:Figure 38.17a, b
Baylor	41ML35	McLennan	Weches	Story and Shafer 1965:Figure 23
Clark	41ML39	McLennan	Canton	Watt 1965:Figure 5C–E
Cement Hill	41ML43	McLennan	Holly	TARL collections
Chupik	41ML44	McLennan	Holly	Perttula et al. 2003:Figure 3 (item TPK148)
Chupik	41ML44	McLennan	Pennington	Locke 1975:Figure 6
Chupik	41ML44	McLennan	Weches	Locke 1975:Figure 6o
Chupik	41ML44	McLennan	Dunkin	Locke 1975:Figure 6
Chupik	41ML44	McLennan	Hickory	Locke 1975:Figure 6
Asa Warner	41ML46	McLennan	Dunkin	Perttula et al. 2003:16
Jones Hill	41PK8	Polk	Weches, Dunkin	McClurkan 1968:Figure 18A, B
Burris #1	41PK88	Polk	Weches	McClurkan 1968:Figures 33C, 34A, B
Cluck Spring	41WM24	Williamson	Holly	TARL collections

Archeological assemblages in central Texas from Clovis to Toyah are almost always either dominated by deer-sized animals, or deer-sized animals constitute a major faunal resource. The presence of deer bones does not constitute a viable material element for distinguishing Prairie Caddo. Bison is nominally represented in most sites yielding Prairie Caddo assemblages if present at all, and may represent a post A.D. 1300 veneer in some cases (e.g., McDonald site). By this time (A.D. 1000–1300), the bow and arrow was the weapon of choice across North America, having replaced the atlatl spear by A.D. 800 (Nassaney and Pyle 1999; Story 1990:248–251), and was used by all groups in Texas. Arrows probably had identifying marks (Griffen 1969:107), but only the points survive. The best opportunity to relate arrows to groups will be through the technological style of the points. It would be impossible to isolate a weapon system specifically designed for deer hunting; indeed, such a system probably did not exist since the bow and arrow was a variable system used to hunt all kinds of prey. Of concern here, however, are the material elements composing the technological system in which deer-sized animals were used, namely artiodactyls, to produce metapodial beaming tools.

Beaming tools (Figure 3; Table 2) are made from artiodactyl metapodials by creating a “troughlike longitudinal groove in the diaphysis (shaft) in either the posterior or anterior side of the bone” (Henderson 1995:7, Figure 3). This groove creates two parallel edges with acute angles much like a double-edged razor blade. Discarded metapodial beamers are typically worn to the extent that the mid-portion of the shaft is almost worn through. Fragments usually break at the narrow part of the shaft. The advantage in using a bone beaming tool is that the edges work to remove the hair but are not sharp enough to cut the hide.

Table 2. Selected sites with metapodial beaming tools

Site/Locality	Site Number	County	Number	Reference
A. C. Saunders	41AN	Anderson	4	Kleinschmidt 1982
Horn	41BQ47	Bosque	1	Watt 1965:107
Tuck Carpenter	41CP5	Camp	4	Turner 1978:25
Pecan Springs	41EL11	Ellis	2	Sorrow 1966:47, 50, Figure 29G, H
Kyle	41HI1	Hill	1	Jelks 1962:Figure 26F
T. M. Sanders	41LR2	Lamar	3	Krieger 1946:193
Baylor	41ML35	McLennan	1	Story and Shafer 1965:Figure 25D
Clark	41ML39	McLennan	1	Watt 1965:107, Figure 5A
Deshazo	41NA27	Nacogdoches	7	Henderson 1995:Figure 3A–F
Walter Bell	41SB50	Sabine	1	Jelks 1965:186-187

The proposition that deer metapodial beamers are part of a Caddoan technological style of deer hide processing has been made earlier in this paper. While none were recovered or preserved at the George C. Davis site, beamers have been recovered from contexts in the Caddoan area that date to the early Caddoan period at the Sanders site (Krieger 1946:Plate 23f), from early-middle contexts at Hurricane Hill (Perttula 1999:Figure 11-2a), from middle Caddoan contexts at the Tuck Carpenter site (Turner 1978:25) and Walter Bell (Jelks 1965:186–87), from late Caddoan context at the A. C. Saunders site (Kleinschmidt 1982), and from historic context at the Deshazo site (Henderson 1995). Beamers have been recovered from such prairie sites as Clark, Horn (Watt 1965), Baylor (Story and Shafer 1965), and Pecan Springs (Sorrow 1966). While the distribution of beaming tools is not widespread, their recognition depends on bone preservation, which is normally very poor in east Texas. The fact that beaming tools were recovered from components throughout the Caddoan sequence, I think, is telling in that it identifies this technological style as Caddoan. The use of deer metapodial beamers extends northward into the Plains, or to the colder climes where tailored clothing might be worn against colder conditions. Beamers are not reported from southeast Texas along the Gulf coast, where bone preservation is often excellent. The only other area of the state outside of east Texas

BEAMERS

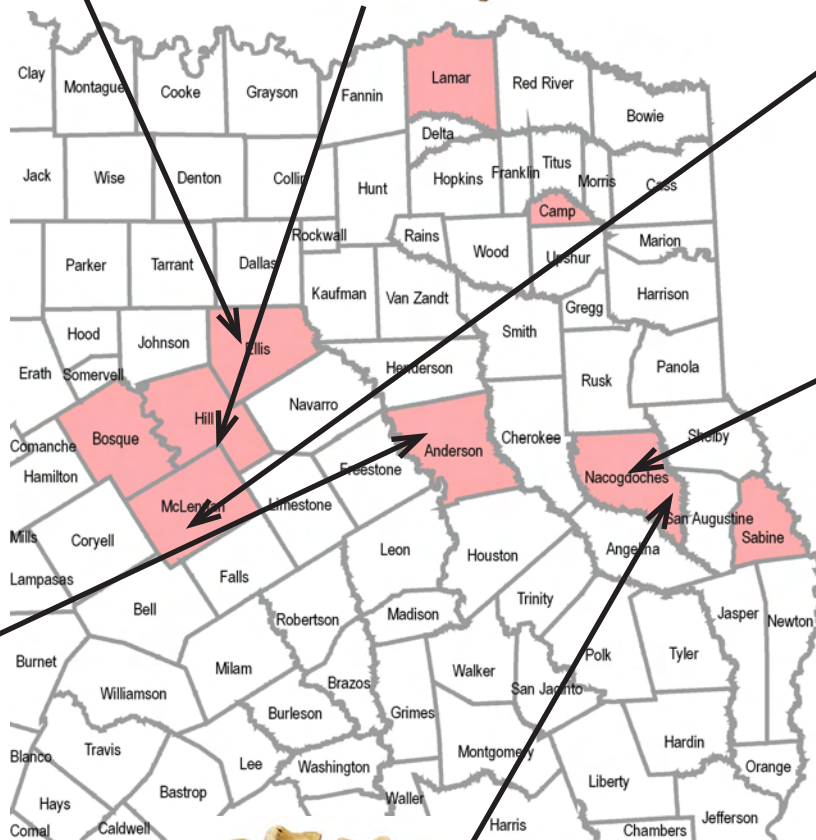


Figure 3. Examples of metapodial beaming tools and their distribution (shaded counties).

where deer metapodial beamers occur is in the central Texas prairies. Beamers are not reported from the Edwards Plateau, nor from south, west-central, and southwest Texas. In southwest Texas, the frequency of deer gives way to jackrabbits, and deer skin garments give way to textile and rabbit skin garments (Shafer 1986:124–128).

Tracing the distribution of bone tools is handicapped by two factors: bone preservation and archeological recognition of the tool form. The distribution of metapodial beaming tools clearly extends from the Caddo heartland of northeast Texas across to the Balcones Edge. Bone preservation is not consistent in either east Texas or central Texas, but conditions for bone preservation tend to be better in central Texas, especially in Blackland Prairie and terrace sites. The problem of identification is endemic. Bone tools get little attention in CRM reports, and when they do, descriptions are often so vague as to make a mental image of the specimen being described difficult. Bone tools almost never make it to the synthesis chapters. Since bone tools are held in low regard in terms of interpretive value, the items are often either listed and not described (Trierweiler 1996:572–573) or are minimally described but not illustrated (e.g., Gadus et al. 2002:128; Tomka and Kleinbach 1999:197). The result is that potential data relevant to the Prairie Caddo model cannot be fully accessed in the extant literature. The frequency of beaming tools in central Texas sites is very likely much higher than current literature indicates.

Bone needles are an added material element for a technological system incorporating metapodial beaming tools that might suggest sewing tailored garments. They are added here to draw attention to the tool form and its potential relevance. While needles have not been specifically identified as a Caddoan technological style, the present known distribution may suggest that it was among the people of the prairie. Not enough information is available to indicate if both occur in the prairie area, but archeologists need to be alerted to look for needles or fragments and take into consideration the implications of their presence in an assemblage.

Bone needles also have a restricted distribution in central Texas both temporally and spatially (Figure 4; Table 3). Two types of needles have been recovered in sites yielding Prairie Caddo assemblage elements: eyed needles (41BL58, see Jelks 1962) and grooved needles. Eyed needles have a lenticular cross section, are exceptionally well made, and are long. Grooved needles have round cross sections, are toothpick-sized, and also are well made. Grooved needles have a circular or spiral groove at the base. Temporal data on the two forms is lacking, and it is uncertain if the styles have functional or temporal meaning. The geographic occurrence of needles in central Texas seems to be restricted to the Balcones Edge (Jelks 1962:Figure 27c–e; Shafer et al. 1964:Figure 17g, h; Abbott and Trierweiler 1995:758) and prairies to the north (Ross 1966:Figure 29b–l; Sorrow 1966:Figure 28e–g). The distribution patterns are probably a factor of preservation, recognition, and reporting. Eyed needles have been recovered from deposits yielding the Prairie Caddo diagnostics (Bonham-Alba points, early Caddoan ceramics, and Gahagan bifaces) at the Kyle site and at Belton Lake (41BL65). Grooved needles have been recovered at Belton Lake (41BL23, 41BL65) and at Fort Hood associated with Scallorn and unnamed arrow points at 41CV1167 (Abbott and Trierweiler 1995). A grooved needle also was recovered at 41MM341 associated with solid prairie assemblages (Gadus et al. 2006:122, Figure 7-24a). The Pecan Springs and Glen Hill specimens are from the northern prairie area. The Pecan Springs specimens were recovered in the same site context as metapodial beamers, but their time range is unclear; poor excavation methods at Pecan Springs negated any stratigraphic integrity that may have existed.

The point style defined as Bonham-Alba is a common arrow point in central Texas prairies and the Balcones Edge in the Late Prehistoric. The distribution of this point type, gleaned from published reports, is shown in Figure 5 and listed in Table 4 and extends from Cherokee County west across the prairies to the Balcones Edge. The term Bonham-Alba is deliberately coined to emphasize a point style whose attributes crosscut the formal definition of these two types. The formal types Bonham, Alba, and Perdiz are based largely on stem form and not on technology. Bonham-

BONE NEEDLES

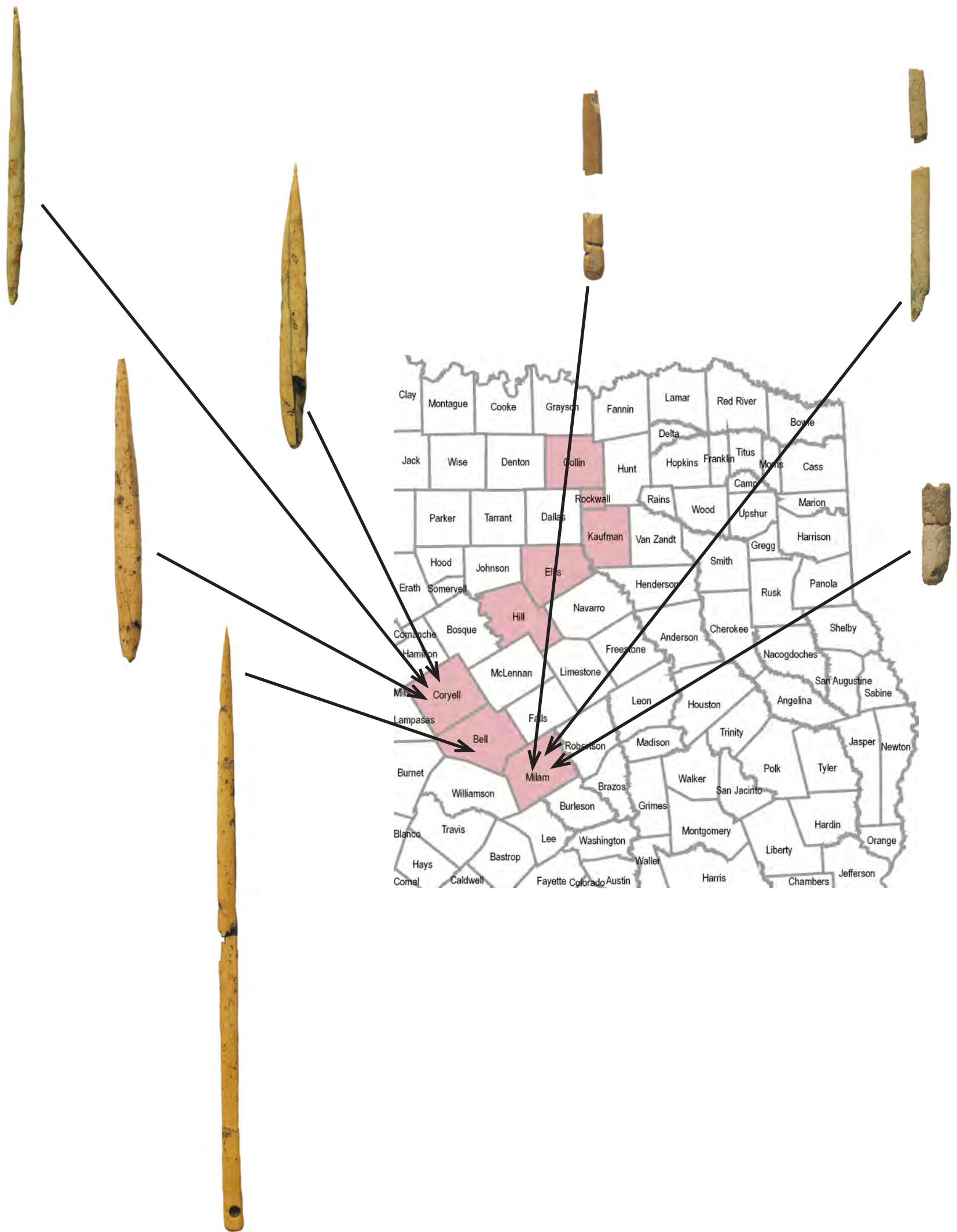


Figure 4. Examples of bone needles and their distribution (shaded counties).

Table 3. Selected sites with bone needles

Site/Locality	Site Number	County	Number	Type	Reference
Garth	41BL22	Bell	1	grooved	Shafer et al. 1964:70, Figure 17H
Simmonds	41BL58	Bell	1	eyed	Figure 4, this report
Domino	41BL65	Bell	1	grooved	Shafer et al.1964:70, Figure 17G
Various	various	Collin, etc.	2	grooved	Stephenson 1952:Figure 94a-12, 13
Various	various	Collin, etc.	4	ungrooved	Stephenson 1952:Figure 94a-14-17
Grimes Houy Shelter #2	41CV17	Coryell	1	ungrooved	Miller and Jelks 1952; Figure 4, this report
–	41CV35	Coryell	1	ungrooved	Figure 4, this report
–	41CV1167	Coryell	1	eyed?	Abbott and Trierweiler 1995:759
Pecan Springs	41EL11	Ellis	2	grooved	Sorrow 1966:Figure 28f, g
Kyle	41HI1	Hill	2	eyed	Jelks 1962:66, Figure 27C, D
McDonald	41HI105	Hill	1	eyed?	Brown et al. 1987:Figure 38.20d
Gossett Bottoms	41KF7	Kaufman	3	ungrooved	Story 1965:235, Figure 25L-N
J. B. White	41MM341	Milam	3	grooved	Gadus et al. 2006:Figure 7-24a-c
Glen Hill	41RW4	Rockwall	15	ungrooved	Ross 1966:Figure 29b-1

Alba specimens include points with parallel stems and straight bases, parallel stems with convex bases, and slightly contracting stems with rounded bases. The attributes that distinguish Bonham-Alba points are on the barbed blades which are often long, recurved, lenticular in cross section, and sometimes serrated. These attributes are lacking on the locally made arrow points at the Davis site itself, probably due to the size of the raw materials available. Long recurved blades are a distinctive technological style found in early Caddoan arrow points based on the large samples from Davis site tombs (Shafer 1973:Figures 15–17). The point style is produced from a biface preform on a flake blank that often incorporated both indirect percussion and pressure flaking in the reduction process. The bifacing technology is similar to that seen for Scallorn arrow points, but the difference in the preform shape distinguishes the two styles. Bonham-Alba preforms have more of a diamond shape or rudimentary stem and are termed Cliffton by typologists. The Bonham-Alba preforms differ from the triangular Fresno preforms of Scallorn but are similar to the Cliffton preform for Perdiz. Because of the similarity, it will be difficult to distinguish the Bonham-Alba preforms from those for Perdiz. The one difference in technological style that I have noted is that Perdiz are more often made on flakes rather than the bifaced preforms characteristic of Bonham-Alba, but the technology of Perdiz is all pressure flaking.

Because Bonham-Alba stems can be contracting, they often are classified as Perdiz, but examples shown by Jelks (1962:Figure 12), Miller and Jelks (1952:Plate 24-2), and Shafer et al. (1964:Figure 9a, b, f, g–j) are included here as Bonham-Alba because of the technological style of the serrated, recurved blade and parallel to slightly contracting stems and round bases. Alba-like points reported from Aquilla Reservoir sites (Brown et al. 1987:Figures 38-13 and 38-14) are also included under the Bonham-Alba heading. Reworked blades lose their characteristic recurved style and, in some cases, the serrations. The distinctions between Bonham-Alba and Perdiz are admittedly subtle and, and on some specimens, indistinguishable if stem form alone is considered. Some typologists are probably going to struggle to make the call because of the stylistic overlap in stem characteristics and contextual interdigitation. It is the distribution of the recurved, often serrated blade form on a biface perform that distinguishes the style.

The Bonham-Alba distribution shown in Figure 5 incorporates only part of the area of distribution for Bonham points discussed by Prewitt (1995:93) and Turner and Hester (1999:202). Prewitt bases his distribution on the strict typological definition of Bonham, which is not followed here, while the distribution shown by Turner and Hester is more in keeping with what I consider the accurate range for the type. Bonham-Alba points may co-occur with Scallorn at the earlier end of their temporal distribution, representing some interdigitation. This appears to be the case at Hoxie Bridge

BONNHAM-ALBA

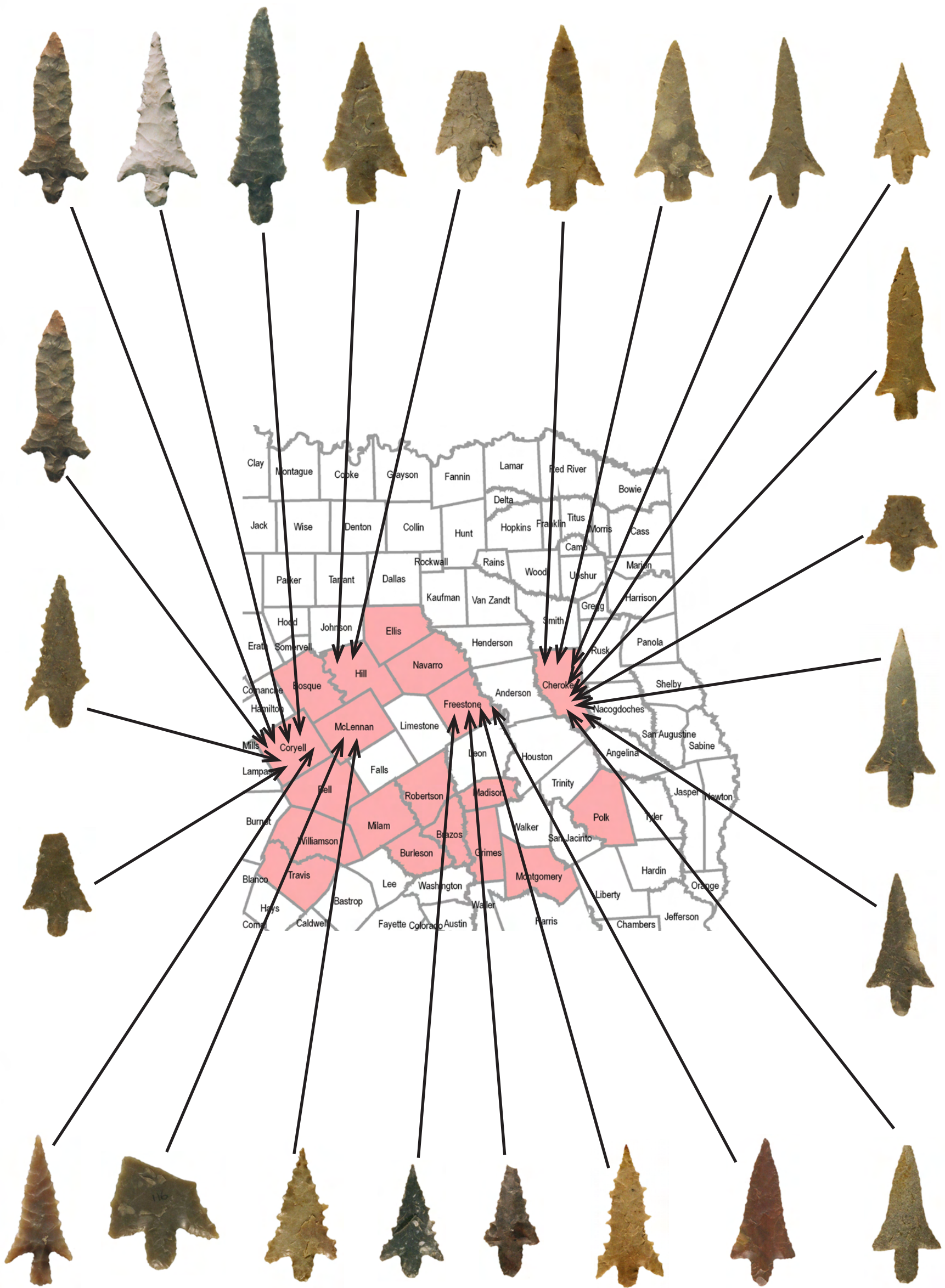


Figure 5. Examples of Bonham-Alba arrow points and their distribution (shaded counties).

Table 4. Selected sites with Bonham-Alba arrow points

Site/Locality	Site Number	County	Number	Reference
Fort Hood	41BL142-A	Bell	1	Ringstaff and Mehalchick 2003:Figure 6.1
–	41BL23	Bell	6	Shafer et al. 1964:Figure 9 A, B, F, H–J
Spicewood Creek	41BL495	Bell	4	Dickens 1993:Figure 25G–I
–	41BL65	Bell	1	Shafer et al. 1964:Figure 9G
Fort Hood	–	Bell, etc.	5	Tomka 1995:Figure 8.29 (item 2-888-103)
Fort Hood	–	Bell, etc.	5	Tomka 1996:Figure 7.8 (items 1-935-026, 1-88-151)
Five Goat Shelter	41BQ63	Bosque	2	Henry and Kirby 1980:Figure 6-76h, i
Unknown	–	Brazos	10 est.	Brazos Valley Museum of Natural History
–	41BU16	Burleson	6	Roemer and Carlson 1987:Figure 26A, B, Figure 27E, J–L
George C. Davis	41CE19	Cherokee	100	Shafer 1973:Figures 16, 17W–T1
Fort Hood	41CV722	Coryell	4	Tomka and Kleinbach 1999:Figure 67A, B, I
Pecan Springs	41EL11	Ellis	1	Sorrow 1966:Figure 13A
Bird Point Island	41FT201	Freestone	3	McGregor 1987:Figure 7-1a, d, q
McGuire's Garden	41FT425	Freestone	10+	Gadus et al. 2002:Figure 38 (specimens in 2nd and 3rd rows)
–	41GM281	Grimes	10	Rogers 1995:Figure 21 (items 1325, 1282), Figure 23 (items 577, 520, 751, 882, 1081, 1071), Figure 24 (items 242, 1185)
Kyle	41HI1	Hill	9	Jelks 1962:Figure 14A–D, Figure 12C, F, G–I
–	41HI105	Hill	10+	TARL collections
McDonald	41HI105	Hill	28	Brown et al. 1987:Figure 38.13 b, d, n, q–s, z, aa, bb, dd, hh, ii; Figure 38.14a–l, n, w, x
–	41HI171	Hill	10+	TARL collections
Unknown	–	Madison	10 est.	Brazos Valley Museum of Natural History
Baylor	41ML35	McLennan	9	Story and Shafer 1965:Figure 8O, Figure 9A–G, K
Clark	41ML39	McLennan	11	Watt 1965:Figure 3D–N
–	41ML46	McLennan	10+	TARL collections
J. B. White	41MM341	Milam	6	Gadus et al. 2006:Figure 7-4a–f
–	41MQ5	Montgomery	4	Shafer 1968:Figure 40A–D
–	41MQ6	Montgomery	13	Shafer 1968:Figure 40A–D
Little Cedar Creek	41NV173	Navarro	2	Irvine and McGregor 1987:Figure 11–16a, c
Burriss #1	41PK88	Polk	3	McClurkan 1968:Figure 40Q–S
–	41RT267	Robertson	2	Davis et al. 1987:Figure 18D, E
Kenyon Rockshelter	41TV742	Travis	3	Coffman et al. 1986:Figure 86j–l
Hoxie Bridge	41WM130	Williamson	15	Bond 1978:Figure 34a–k, r–v
Loeve-Fox	41WM230	Williamson	4	Prewitt 1974:Figure 16t, u, w, x

(Bond 1978) and in my own observations at Urbankte (41CV26). A working hypothesis would be that the two point styles seldom co-occur. The same pattern of interdigitation may also occur at the late end of the temporal sequence with Perdiz, the earliest dates of which are ca. A.D.1250/1300 (Ricklis 1995).

Establishing a date range for Bonham-Alba remains to be done, although Prewitt (1981) may have already provided a hint as to what the dates might be. In his provocative north-south comparison of Austin and Toyah phase dates, he notes that Perdiz date earlier in the north (prairie) area than in the south (Edwards Plateau and southern Texas). These dates cluster between A.D. 1150 and 1350 on Prewitt's (1981:Figure 7) chart. My suspicion is that Prewitt relied on Jelks's typology

Table 5. Selected sites with Gahagan bifaces

Site/Locality	Site Number	County	Number	Reference
Pace McDonald	41AN51	Anderson	1	Clyde Amick collection
Garth	41BL22	Bell	2	Shafer 2003b; Figure 6, this report
Penny Winkle	41BL23	Bell	4	Shafer et al. 1964:Table 2 (listed as Friday knives); Figure 6, this report
Iron Bridge	41BL47	Bell	1	Shafer et al. 1964:Figure 11H
Simmonds	41BL58	Bell	1	Shafer et al. 1964:Figure 11G
Domino	41BL65	Bell	3	Shafer et al. 1964:Figure 11I, J
Fort Hood	41BL991-B	Bell	1	Ringstaff and Mehalchick 2003:Figure 6.3
Fort Hood	–	Bell/Coryell	1	Tomka 1996:Figure 7.10 (item 2-844-194)
TAMU West	–	Brazos	1	Shafer 2003b
Unknown	–	Brazos, etc.	17	Brazos Valley Museum of Natural History, State Landmark Collection
–	41BU16	Burleson	1	Roemer and Carlson 1987:Figure 24I
George C. Davis	41CE19	Cherokee	65	Newell and Krieger 1949:Figure 6A–H; Shafer 1973:224-231, Figure 19A–V; Baskin 1981:Figure 254F, G
Grimes Houy Shelter	41CV13	Coryell		Miller and Jelks 1952:Plate 26, Table 2
Grimes Houy Midden	41CV21	Coryell		Miller and Jelks 1952:Plate 26, Table 3
Urbankte	41CV26	Coryell	4	Miller and Jelks 1952:Plate 26, Table 1; Figure 6, this report
Johnson's Hole	–	Coryell	2	Miller and Jelks 1952:Plate 26, Table 4
Fort Hood	–	Coryell	1	Ensor 1988:Figure 21H
Cobb-Poole	–	Dallas	1	Skinner and Connors 1979:Figure 16C
Unknown	–	Grimes	1	Brazos Valley Museum of Natural History, Box 62
McDonald	41HI105	Hill	1	Brown et al. 1987:Figure 38.11c
Old Union Bridge	41LT12	Limestone	1	Mallouf 1979:Figure 22I
Tehuacana Creek	–	Limestone	1	C. K. Chandler collection
Clark	41ML39	McLennan	1	Watt 1965:Figure 4B
J. B. White	41MM341	Milam	6	Gadus et al: 2006:Figure 7-12e–g
Foster's Farm	–	Milam	1	Paula Wiggington, personal communication
Foster's Farm	–	Milam	1	John White, personal communication
Crawford	41PK69	Polk	1	Ensor and Carlson 1988:Figures 37D, 46D
Burris No. 1	41PK88	Polk	1	McClurkan 1968:Figure 46D
Bentsen Clark	41RR41	Red River	3	Banks and Winters 1975
CR485	–	Robertson	1	Charles Boyd collection
Unknown	–	Washington	1	Brazos Valley Museum of Natural History, Box 17, James and Dorrine Glenn collection
Hoxie Bridge	41WM130	Williamson	7	Bond 1978:159–162, Figure 39
Loeve-Fox	41WM230	Williamson	1	Prewitt 1974:Figure 18q
Mineral Springs	3HO1	Arkansas	1	Bohannon 1973:Figure 17L
Mounds Plantation	16CD12	Louisiana	12	Webb and McKinney 1975:97–99, Figure 12r–aa
Gahagan	16RR1	Louisiana	13	Moore 1912:Plates 18, 19, 21
Gahagan	16RR1	Louisiana	21	Webb and Dodd 1939:Plate 27-1
Spiro	34LF46, etc.	Oklahoma	4	Brown 1996:Figure 2-68a–c

(1962) at Kyle, Brown et al.'s (1987) at McDonald, and Shafer et al.'s (1964) at Penny Winkle. All classed barbed points as Perdiz that I would now see as Bonham-Alba. With the association of early Caddoan pottery, I would estimate a date range beginning as A.D. 1100 ± 100 for Bonham-Alba.

Gahagan bifaces (knives) are another material class attributed to the Prairie Caddo (Figure 6; Table 5). The name Gahagan was first suggested by Clarence H. Webb at the 1970 Caddoan conference (Shafer 1973:229) in place of the term Copena knives coined by Newell and Krieger (1949:173, 174) because of their vague similarity in form (but not technology) to the so-called Copena points for northern Alabama (Webb and Dejarnette 1942:301–306).

Gahagan bases are either slightly concave or straight, and the lateral edges are slightly recurved, contracting slightly below the base and reaching maximum width about mid-length on the less-reduced examples. Lateral edges are finished and retouched by fine pressure flaking. Thinning flakes expand out from the platform and terminate near the middle of the blade rather than carrying across, indicating well-controlled thinning skill. Cross sections are faintly lenticular to almost flat. Retouching reduces the size and curvature of the blade to the extent that the blades may become almost triangular but usually retain the recurved blade form. Beveling along the lower part of the left edge is a rare, uncharacteristic method of resharpening. The knives may display moderate to extensive use wear in the form of microflake damage or “nicking” and edge abrasion. The overall size depends largely on the degree of retouch. Pristine specimens from the Davis site tombs (Features 119 and 134) display virtually no evidence of wear and retouch, whereas those from the village contexts and later burials at the same site (Features 118 and 161) show evidence of both wear and size reduction due to retouch.

Small, expertly thinned triangular bifaces in central Texas associated with Austin interval deposits have been typed by Jelks (1962:42) as Friday knives. The temporal and contextual association of Friday exclusively with the Austin interval is uncertain, as specimens that fit the Friday description also co-occur with Bonham-Alba points. There is some overlap in form and technology in what some call Friday and specimens that I call Gahagan. Jelks (1962) may have lumped Gahagan with Friday, and I certainly did at Belton, where I broadened the Friday description to include specimens that I would now call Gahagan (Shafer et al. 1964:44). The short triangular examples of Friday appear different from the distinctive recurved Gahagan in that they are wider in proportion to length. I suspect that some examples classed as Friday are, in fact, reworked Gahagans. But I also would not rule out the possibility that Friday knives are forebears to the essential knife technology in the Late Prehistoric.

Arrow points are too delicate for heavy knife use compared to dart points, which probably held dual purposes as points and knives. Not having the dual-purpose tool once the bow and arrow was adopted, a need existed for a separate knife form. Unlike Archaic assemblages, all Late Prehistoric assemblages had formal knives. It is either Friday or Gahagan (depending on one's classification proclivities) in the Austin interval; the prairie area has Gahagan, and Toyah has four-edge beveled knives. The similarities in form and technology between Friday and Gahagan are apparent, but the usually larger, recurved Gahagan stands out as a distinctive technological style easily separated from the small, triangular Friday knives.

The technological style of butchering and knife use provided the practical context for Gahagan bifaces. The expert thinning characteristic of the knife style is a critical attribute. Pressure retouch that created fine, almost serrated edges did not reduce the cutting effectiveness as did the beveling of four-edge knives common in Toyah assemblages.

Manufacturing sites for Gahagan bifaces could have been along the Balcones Edge, utilizing the chert outcrops of western Bell, western Williamson, Coryell, and McLennan Counties (Dockall 1992). Terrace and stream gravels where large Edwards chert cobbles are available also occur along prairie streams in eastern Williamson, Bell, and Milam Counties, such as at the Hoxie Bridge, Loeve-

Fox, and J. B. White sites. These knives are expertly thinned by soft-hammer or punch flaking with fine pressure marginal retouch. The technological style of thinning, whether billet or punch, is not known, although any flintknapper would identify it as soft hammer or billet flaking. With the help of John Dockall (1992) and information provided by Tim Perttula (personal communication 2004), known examples of Gahagan bifaces were plotted by county (Figure 6; Table 5). This map is merely to show where Gahagan bifaces occur and is not meant to reflect density.

Thinning a biface using a billet is a technological style different from that in which a punch is used, although the results are indistinguishable due to the potentially wide contact surface at fracture initiation and the large bending initiation thinning flake scars. The notion that all biface thinning is done with billet flaking is an untested assumption, however, and is based on modern flintknappers' technological style of replicating thinned bifaces. Modern technological style of flintknapping originated with Don Crabtree, J. B. Sollberger, and Errett Callahan, all of whom used soft hammers of elk and moose to thin bifaces. More-recent flintknappers use copper billets, a far cry from the knapping tools the Native Americans had at their disposal. Few if any modern flintknappers use deer antler other than to demonstrate that such implements work to remove biface-thinning flakes.

The archeological correlates for the technological system that produced Gahagan bifaces have not yet been identified. Billets or punches to thin the bifaces and pressure tools to sharpen edges should be identifiable in modified bone assemblages. Antler tools consisting of antler bases are rare (Bement 1994:Figure 9d; Highley 1985:200–205, Figure 44g; Jelks 1962:Figure 29d; Redder 1985:Figure 3a; Taylor and Highley 1995:529, Figure 308; Watt 1956:Figure 6). Most are reported from Archaic sites, although Watt's antler tool came from Burial 52 at the Asa Warner site. This burial, which had a large base-tang knife and a biface blank, may have contained a knapping kit. I am not convinced from published reports that any of the antler base tools are in fact billets, although they may be. Shorter antler specimens such as the ones reported from Lemens Rockshelter and Asa Warner could easily be punches. Most of the early Postclassic Maya punches from Colha, Belize, for example, are made of antler bases (Shafer 1985:Figure 12.6). Few archeologists in Texas are aware of the Maya punches and the large thin bifaces made using them. If the Maya could make large thin bifaces using punches, then it is reasonable to assume the central Texas flintknappers could as well. Missing in bone assemblages across central Texas are antler billets and the bone debitage related to their manufacture; antler debitage from punch manufacture was present at Colha. If such tools and debitage do occur, they are not being reported. The most-common flintknapping tools recovered archeologically are antler punches (often misidentified), antler tine pressure flakers, and deer ulna pressure flakers. Examples of presumed antler flakers from Archaic sites are not convincingly shown to have been billets.

The use of indirect percussion using an antler punch is foreign to most modern flintknappers, but it was a method widely used by prehistoric chipped stone artisans from North America to Central America. Punches made of deer antler bases have large contact areas that produce wide flake initiations consistent with the production of large biface-thinning flakes (Geib 2004). The rare finds of flintknappers' kits provide a glimpse into the tool set used for chipped stone manufacture. Flintknapper kits from Horse Shoe Ranch Caves (Shafer 1986:105), Burial 119 at Morhiss (Dockall and Dockall 1999), Feature 9 at the Crestmont site (Hall 2002), Lemens Rockshelter (Smith 1994), and the San Dune Cave cache in Utah (Geib 2004) are cases in point. The Horse Shoe Ranch Caves tool kit clearly provisioned the man for the hunt. It contained not only biface blanks, spare flakes, antler punches, sinew, and an edge abrader but a scarifier, jackrabbit mandibles, and buckeye and mountain laurel seeds for hunting rituals, all components of the technological system supporting his technological style of hunting and associated ritual behavior.

Feature 9 at the Crestmont site (Hall 2002:14, 60–63) contained three antler punches, three biface cores, an atlatl hook, and three socketed bone points. The burial is described as an adult

female, but the sex-linked artifacts associated with the burial are reason to question the sexual identification. The burial most likely contained a flintknapper's kit, and the punches are hardly deniable.

In the American Southwest, the Sand Dune Cave cache (Geib 2004) found inside a white dog skin bag is an excellent view into a Basketmaker II flintknapper and hunter's bag. This bag contained three smaller bags, two of which are prairie dog skin bags, and a bundle of six dart point fore shafts with hafted stone points and two large mammal tendons for sinew. One of these contained 16 dart point preforms, two notched points, and a lump of uranium ore. The other prairie dog skin bag contained eight rod-like punches fashioned of mountain sheep horn. The Lemens Rockshelter (Smith 1994) kit contained only nonperishable items, but here, too, the burial assemblage consisted of seven antler tools, two of which are clearly punches; possibly three others are punches as well, although Smith describes four as flakers. One (Smith 1994:Figure 7a) is identical to Postclassic antler punches from Colha, Belize. These antler base tools at Colha were originally described as billets (Shafer 1985) but were later examined microscopically by the author and John Dockall. We identified them as punches based on wear patterns; they were used in the manufacture of very large thin bifaces. One site that yielded punches, possibly in the time frame of the proposed Prairie Caddo assemblage, is Blum Rockshelter (Jelks 1953). Jelks mentions indirect percussion tools of antler being stratigraphically between Scallorn and Perdiz deposits; these same deposits yielded arrow points identified by Jelks as Alba.

The artiodactyl ulna flaking tool is another implement that occurs with the prairie assemblage. This tool, however, may be more generic in style and not restricted to the Prairie Caddo. Ulna flaking tools were recovered from both the Austin interval intermediate component and Stratum 4 zones at the Kyle site (Jelks 1962:Table 1), including the same zones that yielded Hickory Engraved bottle sherds. Ulna flaking tools (spatulate implements) were also recovered from Austin interval deposits with Scallorn arrow points at the Penny Winkle site (41BL23) (Shafer et al. 1964:Table 2) and at the Davis site (Thurmond and Kleinschmidt 1979:52, 53, Figure 14k, l).

The technological system used to create the Gahagan biface technological style would include a flintknapper's tool kit consisting of a hammerstone, possible edge abrader (one stone may serve both), antler punches, possibly billets, and pressure flaking tools (antler tines, deer ulna, or awl-like implements). This kit is not restricted to the Prairie Caddo interval, but very likely spanned the time from early Archaic through Late Prehistoric. The kit itself may not be a unique element of technological style, but how the tools were put to use certainly was guided by enculturation.

Testing the Hypothesis

Verification of the validity of the Prairie Caddo model will come from future excavations in the prairies of central Texas. The data will, of course, require components with good stratigraphic integrity. This is not to preclude artifacts being interdigitated with either Austin or Toyah diagnostics in superimposed deposits lacking stratigraphic separation. This situation can be expected in and along the Balcones Edge, especially in rockshelters and upland midden deposits occupied over periods of time. One should not assume the two assemblages were necessarily contemporaneous.

The following material categories are considered in offering suggestions for verifying the Prairie Caddo model: ceramics, Gahagan knives, Bonham-Alba arrow points, faunal remains, and human remains.

Systemic and stylistic approaches are recommended for ceramic analysis by emphasizing the technological systems to gain information on the technological styles behind their production. Both petrographic and NAA analysis should become standard for ceramics from central Texas sites

and will constitute an important part of ceramic analysis (Perttula et al. 2003). Using NAA analysis, Perttula et al. (2003) and Creel (personal communication 2004) have shown that previously identified Caddoan ceramics from several central Texas sites are indeed grouped with sherds from the Caddoan area. Some of the sherds from central Texas may be chemically grouped with those from the Caddoan area simply because they are from the same (Wilcox) geological formation. Those recovered from Bell, Coryell, McLennan, and Hill Counties, however, are clearly from a different geological formation than the Davis site.

Vessel form, mode of decoration, temper analysis, and size are also important criteria that provide additional information for examining the technological style of production as well as the technological style of use—two significantly different manifestations of technological style. Lipid analysis may also prove useful with regards to identifying substances actually cooked in the vessels.

Most Caddoan pottery in central Texas is either grog tempered or bone tempered, usually with varying amounts of sand. Bone tempering is regarded here as an ancient Caddoan technological style that spread into adjacent regions. It probably mimicked limestone-tempered pottery among Mississippian groups in the southeastern United States. Bone tempering is a localized phenomenon in North America, occurring only in portions of the Trans-Mississippi South and central and south Texas. However, bone tempering cannot be regarded as uniquely Caddoan based on what we currently know about its distribution in time and space, despite the possibility that the style was introduced via Caddo women. The earliest example of bone tempering is Cooper Boneware, which occurs in the Fource Maline (Schambach 1998:21–23), the distribution of which extends into northeast Texas during the middle and late Woodland periods. Bone tempering occurs frequently in east and southeast Texas along with grog tempering, especially in jars exhibiting wet-paste decorations. Bone tempering is rare at the Davis site (Newell and Krieger 1949; Suhm et al. 1954) and in any early Caddo period pottery in the southern portion of northeast Texas (Nancy Kenmotsu, personal communication 2004). This observation may be very helpful in distinguishing early Caddo period Davis site grog-tempered pottery in central Texas from that introduced later from other Caddo sources that included bone as a tempering agent. Bone tempering and grog tempering are two different technological styles.

Since ceramic manufacture is an additive process and leaves little material evidence behind, tools used in ceramic manufacture such as sherd or gourd scraping tools are among the few items that might indicate the presence of ceramic manufacture. Sherd scrapers may not have been part of the ceramic tool kit among Caddo potters; perishable tools such as gourd sherds or wooden scrapers may have been preferred. Pot-polishing stones do occur at the Davis site (Newell and Krieger 1949; Shafer 1973) but have not been reported from sites yielding Prairie Caddo assemblages. The absence of such tools would be additional evidence for the importation of nonlocal ceramics.

Ceramics are not nearly as common in prairie sites as they are in sites in the Caddo heartland. Village sites such as Asa Warner, Chupik, McDonald, and Urbankte have respectable ceramic assemblages, but outlier sites only have a smattering of pottery at best. The explanation is mobility. This is not to say that hunters and gatherers did not use pottery. Rather, the use of pottery among Late Prehistoric hunters and gatherers was proportional to two factors: mobility and mode of transportation. Hunters and gatherers along the Texas coast (Akokisa and Karankawa, for example), were mobile but had the advantage of canoe transportation and a means of porting fragile vessels from campsite to campsite.

Pedestrian hunters and gatherers of central Texas, on the other hand, did not have the transportation advantage, with the possible exception of the Brazos River, where most of the more-prolific ceramic sites occur. The dearth of ceramics in small campsites of the pedestrian groups in central Texas suggests its use was of secondary and not primary importance. Ceramic vessels did not find their way into graves or other contexts that would otherwise suggest they were prestige goods.

Use-wear studies have not been an object of analysis, but burning, sooting, and other signs of utilitarian use would be expected. Ceramics, while often used, played a far less significant role than in the sedentary sites in the Caddo heartland. Jars were used for cooking and, when broken, were not replaced as they were in the heartland. Bottles carried as canteens were broken in village and outlier sites, and likewise not replaced. The general paucity of ceramics in Prairie Caddo sites is partly due to the fact that there was no replacement rate for the imported styles. It remains to be demonstrated that locally made ceramics replaced broken imported vessels. In contrast, sedentary Caddo in the heartland replaced broken vessels to maintain a household assemblage of cooking, serving, and storage vessels. Cooking jars are the most common functional type of vessel in Prairie Caddo sites, and bowls and bottles are less frequent.

The issue is whether the ceramics in central Texas constituted a trade ware, and this is a big issue that may never be solved. There are a number of mechanisms for exchange among nonindustrial societies (trade, gifts, theft), and exchange of goods was often embedded in other social behaviors, such as feasting. Gift giving of accumulated material possessions was a widely practiced behavior among formative and chiefdom-level societies (Hayden 2001). My argument is that Caddo parties leaving Davis after ceremonial occasions brought pottery with them obtained through various mechanisms of exchange and used the pottery essentially for domestic roles. This form of exchange is beyond proof, however, and all that can be done archeologically is to determine the origin(s) of the pottery and attempt to determine the social identity of the ultimate users through the best means possible.

In order to identify early Caddoan ceramics in central Texas, I suggest the following analytical steps, not necessarily in this order:

1. Compare decorative motifs and styles to the Davis site assemblage to identify early Caddo pottery in Prairie Caddo sites.
2. Conduct NAA analysis of a sample of Davis site pottery for a baseline comparison for early Caddoan pottery from central Texas.
3. Conduct petrographic analysis of Davis site pottery to establish a baseline comparison for early Caddoan pottery from central Texas.
4. Determine vessel size through rim and body sherd diameters from both Prairie Caddo and the Davis site pottery using a graduated chart (Orton et al. 1993:Figure 13.2).
5. Determine vessel form using sherd curvatures and decorative styles and note frequencies of vessel forms from Prairie Caddo sites to compare with extant data from the Davis site (Newell and Krieger 1949:81–145; Thurmond and Kleinschmidt 1979).
6. Consider vessel function using vessel form and decorative motifs. Wet-paste decorations (punctuations, incising, brushing) occur on jar forms, whereas engraving occurs on bowls and bottles. These functional criteria for decorative styles provide direct clues for vessel use. Jars were used for cooking, whereas bowls and bottles were for serving.
7. Conduct lipid analysis to establish what was prepared in vessels. This is especially recommended for jars.

Faunal studies will be another important analytical component for Prairie Caddo sites. Deer bones will be anticipated both for dietary and resource needs. Faunal studies will need to examine for attributes of wear with regards to modified bones and mussel shells. Bone beaming tools often become fragmented, and identifying beamer fragments is just as important as identifying finished tools. Needles and needle fragments may not be caught in 1/4-inch screens. Fine-screening will be essential for full faunal recovery. Persons conducting modified bone analysis also need to be cognizant of functional contexts in which specific styles of bone tools are used. Currently, this category of material culture gets trivialized with very little attention other than description with little or no interpretive discussions. Likewise, other resources such as a certain species of mussel shell (Yellow sandshell [*Lampsilis teres*]) [Howells et al. 2003]) may have been expedient scraping tools used in hair removal in lieu of metapodial beamers (Jelks 1962:Figure 33a; Shafer et al. 1964:Figure 17v;

Stephenson 1970:Plate 20g). I am not certain as to the specific association of this shell with the Prairie Caddo; it may be associated with the Austin interval instead. Researchers should be alerted to its possible presence, however.

As mentioned earlier, deer metapodial beaming tools are used to illustrate a material component of a specific technological style of hide working. To achieve the soft pliable deer skins for clothing requires brain tanning, and beaming tools are used to remove the hair as a step in that process (Wiederhold 2004). Bone technology is a component of that technological style of hide processing, and the deer metapodial beamer is itself a technological style of beaming. Other beaming tools used in a similar fashion constitute additional technological styles at that scale of scraping tools. Since technological style can be multilayered and each material component can be a product of technological style, recognizing such alternative resources will be crucial in factoring out the nuances of the Prairie Caddo assemblage. The recovery of deer metapodial beamers, needles, and antler knapping tools will be dependent on bone preservation. While bone preservation across the central Texas prairies varies according to soil chemistry, it is generally good in most prairie sites.

If bone is preserved, I would make every effort to squeeze as much information from the assemblage as possible in pursuit of technological style of hunting, processing, and use of the animal resources. For example:

1. Identify species present and ratios of specific kinds of animals (number of deer compared to other animals, for example). Over time, the pattern of deer exploitation should become clearer if analytical procedures are standardized and uniform.
2. Note differential butchering patterns for specific bones; if metapodials are under-represented in butchered bones, then they may have been culled for tool use.
3. Examine bone assemblages closely for modified bones, especially metapodial fragments that may be fragments of beaming tools. Also, look for bone needles and fragments and antler flaking tools (ulna, antler).

Bone assemblages need to be brought to the forefront of analytical ranking, and the use of bone tools needs to be incorporated into the hypothesized technological styles that might be represented in a hunter-gathering or marginally formative cultural system. Animals were not just hunted for food; many elements were incorporated into other technological systems (brains for tanning, bone for various tools, antler for various functions including tools and costumes, etc.).

An approach used to identify the production area of Gahagan knives is to factor out the particular technological style of biface reduction from the excavated lithics sample. Attention will be given to identifying the components of the technological system used to manufacture a Gahagan biface. Among the criteria of consideration in framing such an analysis are: access to the appropriate size and quality of raw material; demonstrated presence of the technological skill required to reduce that material to a finished product; the technological style of biface reduction as identified through core analysis (biface sequence), platform preparation, and presence of biface-thinning debitage that fits that technological style of biface reduction. All of these artifact classes would constitute the correlates of the Gahagan biface system. Absence of these components except for the finished product would signify the incorporation of Gahagan bifaces through other social mechanisms (Shafer 1973).

Gahagan bifaces were functional knives that, once made, were carried from place to place. They could have been used by the owner until discarded, exchanged, or offered as tribute. The role of the knife shifted from that of a practical tool to one of prestige when traded or offered as tribute in east Texas (Gero 1989). The role duality is demonstrated in the assemblage of Gahagan bifaces recovered from tomb caches at the Davis site (Features 119 and 134) compared to those recovered as individual accoutrements (Features 118 and 161) and from village contexts. Knives from tomb caches are pristine, whereas those from the village and individual accoutrements exhibit extensive evidence

of use in the form of retouch and wear. The presence and positioning of Gahagan bifaces in the Davis site tombs are powerful indications that these items were indeed prestigious and were part of the dress assembly displayed in the most important social presentations.

The approach using technological style for the Gahagan system is necessarily qualitative in part, and requires critical knowledge of biface technologies and how to recognize the respective components. The idea is to introduce testable assumptions for material culture analysis. The real key to understanding the Gahagan technological system rests with the technological style of platform preparation and biface-thinning skill.

Current methods of lithic analysis in central Texas obscure identifying the presence of such a technological system, and essentially identify only the type at best (Gahagan or Friday knife) or “thin biface or stage four biface” at worst in the descriptive analysis. The other components of the technological system used to define the technological style are lost in the segregation of bifaces from debitage and with the emphasis on describing reduction stages in overall biface assemblages and trends in debitage analysis. Neither the bifaces nor debitage are customarily related to specific technological systems. Goode’s (2002) excellent study of lithic technology from the Anthon site in southwest Texas, which factored out the different technological styles and debitage differences between Kinney and Pedernales trajectories, is a notable exception.

I am not implying that current methods of lithic analysis are obsolete. Any analysis should be directed toward specific problems. Linear reduction models for bifaces can be highly informative, and debitage studies are revealing with regards to activity analysis, overall reduction methods, and debitage density. My point is that current methods of lithic analysis are not sufficient in the manner of organization to recognize Gahagan manufacturing localities and need to take a more systemic approach. My experiences at Hoxie Bridge (Bond 1978:159–190) can be used as an example. Clell Bond did an excellent job at the time of describing the biface assemblage and recognizing the Gahagan component. However, he (or I, as principal investigator, take the blame) did not take advantage of an opportunity to set up a problem of relating the debitage and biface failures to Gahagan biface manufacture. The large sample of debitage was counted and sorted but not interpreted with regards to biface systems present at the site. Effective biface and debitage analysis will require recovery of assemblages with good geological context and excavation control. Analyses of mixed-component assemblages will not likely be effective simply because it has yet to be shown that biface-thinning flakes are diagnostic of technological styles in Late Archaic and Late Prehistoric sites in central Texas, despite the fact that some may be. Furthermore, sites whose occupation occurs within the Prairie Caddo time span and in proximity to large chert nodules in excess of about 12 cm in maximum length would automatically be given consideration as localities for Gahagan manufacture. One strategy for analysis is to relate the debitage to biface manufacture by color and type of chert. As Texas archeologists obtain more precise knowledge of Edwards chert variability, our confidence in sourcing increases. Biface failures from Late Prehistoric assemblages containing suspected Prairie Caddo assemblages can be selected out and matched to debitage by color and type rather than by platform type. Platform type and method of detachment will become obvious as the material is sorted out and can be related to the appropriate stages of reduction at the time of their removal. In other words, trends in debitage should show that, as biface thinning progresses, platforms become more acute and the frequency of hard-hammer (cone initiation) flakes decreases at the expense of biface-thinning flakes (flakes with bending initiation). As platforms become more acute, the need arises for raking or abrading the platforms to strengthen them prior to detachment. As the biface becomes thinner, the length-thickness ratio of biface-thinning flakes decreases, and (this is important) flakes become flatter in profile than the typical arched profile of thinning flakes removed from dart points. One cannot necessarily expect the debitage alone to reveal a location of Gahagan manufacture. The absence of a biface failure matching biface-reduction debitage does not mean that a Gahagan biface was not manufactured at a specific site or in the area sampled. A successful effort will leave only debitage.

Considerations and recommendations for lithic analysis to detect Gahagan manufacture include the following:

1. Examine lithic outcrops in proximity to sites being studied for evidence of biface quarrying and novice training.
2. Examine local chert sources to determine size availability. Because failure rate was likely high for Gahagan manufacture compared to other Late Prehistoric lithics, nearness to raw material outcrop would be an important consideration.
3. It is critical that the analysis be integrated with the overall lithic technology study rather than parceled out and studied in isolation.
4. Bifaces failures should be sorted according to chert color and type.
5. Bifaces should be sorted according to a lithic reduction model. Stage determination is subjective, but several good models are available (e.g., Goode 2002).
6. Sort debitage by chert color and type and compare to suspected Gahagan biface failures in the collection.
7. Examine biface failures and debitage of matching chert color and type for refits. Refitted flakes can be highly informative with regards to technological style in revealing a step-by-step strategy of biface thinning.
8. Examine for platform variability among biface-thinning flakes (hardhammer vs. softhammer), platform angle (measured with a goniometer), and platform preparation (raked/abraded or not). This type of information can be used to track the location and steps in biface thinning, as well as provide information about the technological style of biface thinning.
9. Types of percussors (hammerstone, punch, or billet) should be recoverable and related to the Gahagan technological system.

Debitage related to Gahagan biface production will occur at the site where the manufacturing took place and not at sites where the bifaces were not made. I found no biface failures or debitage in my lithic analysis at the Davis site, for example, that might otherwise be related to Gahagan manufacture. In contrast, the debitage sample from Hoxie Bridge was replete with possible thinning flakes removed in Gahagan manufacture. While we could not prove the latter case, the circumstantial evidence is suggestive.

Bonham-Alba arrow points are made from diamond-shaped preforms usually identified as Cliffton arrow points. These are not arrow points at all, but are aborted preforms for Bonham and probably some Perdiz as well since the trajectory of manufacture is similar but not identical. Bonham-Alba points, as noted earlier, are bifaced, often have recurved blades, and usually but not always have parallel stems with rounded or, less often, squared bases. The analyst will have some difficulty probably in sorting out individual specimens from Perdiz, but the technological styles are sufficiently different to draw a distinction. I distinguish Bonham-Alba technological style by the following criteria:

1. Biface blades possibly made using punches and pressure flaked to finish.
2. Long, often recurved, blades.
3. Serrated blade edges best preserved on the longer specimens.
4. Generally parallel stems.
5. Rounded or, less often, somewhat squared bases.

Another unexplored avenue toward establishing central and east Texas ties is bioarcheology. The only bioarcheological syntheses for central and east Texas were divided into separate studies (Steele and Olive 1989, 1990). These studies focused on adaptive efficiency and fitness as a biological measure and did not emphasize genetic affinities between central and east Texas populations. To my knowledge, the presence of cranial modeling, a signature stylistic trait of the Caddo (Derrick and Wilson 1997), has not been reported in central Texas. Two crania reported by Watt (1956:Figure 8) from Asa Warner, however, are suspicious. These crania from Burials 51 and 55 are described as having “low vaults,” but there is no way to confirm if these crania were artificially modeled. Artifacts

associated with the mass burial at Waco (Meroney 1936; Watt and Meroney 1937), notably an ear spool, a cast of which is in TARK collections, suggest Caddoan affiliation. None of the crania illustrations appear to be modeled, although one cannot be certain. Powell's (1994) finding of a cranially modeled individual from Mitchell Ridge in Galveston County is reason enough to be on the lookout for modeled crania in the central Texas prairies. Furthermore, an elaborate Spiro-like engraved conch shell gorget and large oliva shell tinklers associated with a shelter burial along the Brazos near Kopperal in Bosque County (Jesse Howard collection at TARK) strongly suggest the burial of a prominent Caddo person. For reasons stated, cranial reconstruction is important in bioarcheological analysis.

Radiocarbon dating of bone can be used to establish temporal affiliation with the Prairie Caddo. Once context is established, either through direct dating, crossdating, or stratigraphically, bioarcheological studies could be directed toward establishing genetic affinities using dental traits, cranial measurements, and DNA studies. Carbon ratios could also be informative with regards to defining regional dietary patterns. These data would be helpful in establishing Caddoan presence in central Texas. Bioarcheological studies, then, might consider the following analytical procedures to prove or refute the presence of Caddo in central Texas:

1. Cranial reconstruction to identify those few individuals that may have cranial modeling.
2. Cranial measurements that may help to define physical characteristics of Caddo and non-Caddo.
3. DNA to identify a genetic population.
4. Dental traits to visually identify genetic variability between Caddo and non-Caddo.
5. Radiocarbon dating to ascertain the age of human remains recovered from the prairie area.

Importance of Radiocarbon Dates in Phase II Testing

Phase II testing may not yield recognizable artifact styles of the prairie assemblage due to any number of factors such as fragmentary condition, lack of preservation (for faunal remains), and sampling. Therefore, it is critical that radiocarbon samples be collected and run for Late Prehistoric components in the prairie area. Dating components to the time period of the Late Prehistoric prairie assemblage is also critical in testing the Prairie Caddo hypothesis.

PART B: MAKING THE CASE FOR THE DAVIS SITE AS PRAIRIE CADDO

The hypothesis that the George C. Davis site was connected to the prairie area is based on several lines of material evidence. First, the distribution of early Caddoan grog-tempered pottery types from the Davis site in the central Texas prairies distinguishes this connection from that of the northern Prairie Caddo, which resembles more Sanders-like early Caddo of northeast Texas, and from the later Caddoan bone- and grog-tempered ceramics. Second, the presence of Edwards chert cores and finished artifacts at Davis in village contexts provides another material connection. Third, the ceramic assemblage consisting of highly decorated Holly Fine Engraved (approximately 20 percent of all vessels [Thurmond and Kleinschmidt 1979:39]) and extensive inventory of exotic lithics at the Davis site underscore the political and ritual significance of the site and power of its elite residents to draw people in from adjacent regions and distant political centers. Calendar ceremonies and feasts, funerals, ascension rites, and political gatherings were among the likely events that attracted people from distant places and centers. Fourth, the absence of Steiner arrow points and rare occurrence of Friley points and presence of Bonham-Alba and Alba points suggest the Davis site was not as closely connected to the northern prairie Caddoan groups as it was to the southern prairie area.

The George C. Davis site (41CE19), located on a high, east terrace of the Neches River in Cherokee County, lies on the western periphery of the Mississippian cultural area and is small by Mississippian mound center standards (Pauketat 2004:119–144). Its importance to the network of

Caddoan chiefdoms overshadows its size. Description of the site and the chronology of previous work can be found in Newell and Krieger (1949) and Story (1997, 2000). A large collection of ceramic and lithic artifacts was recovered during the WPA excavations and initially described by Krieger (Newell and Krieger 1949). Krieger's typological study of the Davis ceramics laid the foundation for the study of early Caddoan culture in east Texas. More investigations were conducted at the site between 1968 and 1974 and 1979 and 1980 by Dee Ann Story at The University of Texas at Austin (Story 1997) and more recently by Creel (personal communication 2003). Story concentrated her investigations on the west side of the site west of State Highway 21, which transects the terrace and site. She opened Mounds B and C and exposed several blocks and test units throughout the village area. Mound B, like Mound A, was a temple mound constructed in several stages. Mound C is a mortuary mound, also constructed in several stages and containing numerous shaft tombs of early Caddo elite. Story's excavations also yielded additional ceramic and lithic collections and provided information on the spatial distribution of late Woodland and early Caddo occupations. Among the very important contributions made by Story's investigations was the new information provided by the village excavations, several shaft tombs in Mound A, and a large series of radiocarbon dates that fix the beginning Caddo occupation to the later part of the ninth century and extending into the thirteenth century.

Artifacts recovered from Story's excavations in the tombs of Mound C and from the combined works in the village area are used as the basis for defining the lithic patterns at the site (Shafer 1973). The crux of my dissertation was to examine finished tools and debitage to determine what lithic items were produced at the site. The results of this study showed that few formal tools other than arrow points made of locally obtainable materials (fine-grained quartzite, silicified wood, and local chert) and imported Manning Fused Glass were made there, while Bonham-Alba points of central Texas chert and Gahagan bifaces were not produced at the site.

Additional connection to central Texas was shown by the cache of 62 biface preforms 20 m southeast of Mound A (Newell and Krieger 1949:Figures 25j, 61; Shafer 1973:Figure 20C-G; Story 2000) and patinated preforms of Edwards chert from Feature 119. Story (2000) regards the cache as Archaic, but there is no way to be sure. They could just as well be associated with the early Caddoan component. Some of the preforms exhibit evidence of heat treating. While I was not able to identify the source in 1973, I am now quite certain that the material comes from the Leona Park ledge at Belton Lake along the Leon River in Bell County. Also, Feature 119 contained three large triangular preforms of patinated Edwards chert, one of which was ritually smashed. These preforms likely came from an Archaic cache in central Texas, carried to the Davis site and incorporated as tribute in the tomb.

The occupants of the Davis site were directly identified as ancestral Caddoan-speaking people by Suhm, Krieger, and Jelks (1954:151, 152) and indirectly by Newell and Krieger (1949:193, 194) based largely on the typological studies of the ceramics and direct historical assumptions. The tag has stuck, based on the historical continuity in technological styles of early Caddoan pottery and ceramic evolution through middle, late, and historic Caddoan components. Caddo pottery is distinctive in form, ceramic body, and decorations. The continuum of the technological styles of decoration, especially engraving and wet-paste embellishments, and technological styles of clay mixtures (grog, shell, or bone tempering) have served archeologists well in tracing changes in Caddoan culture through time.

The complex and often large structures located in and around Mounds A and B, periodic renovation of Mounds B and C, and elaborate tombs in Mound C all suggest labor-intensive communal efforts and intensive civic activity. Mississippian and Caddoan mound centers, like Chaco Great Houses (Van Keuren 2004), were the settings of large communal gatherings for games, rituals, and feasts if the historic Hasinai gatherings can be used as examples (Griffith 1954:76-81). These Hasinai ceremonies included feasting, whether at First Fruits ceremony or a house-building bee (Newcomb

1961:294, 295). These kinds of gatherings most certainly occurred at the Davis site, especially with regards to mound building, harvest ceremonies, house-building events, competitive games, or elite funerals that brought people who carried objects from distant places. Van Keuren (2004:193) offers a specific definition of a feast as “any supra-household event that involves the special preparation, presentation, and consumption of foodstuffs.” Deitler and Hayden (2001a:3) appropriately note that “feasts” is not a thing but rather a “category used to describe collectively a diverse set of cultural practices.” In other words, feasting itself was embedded in other social events such as those listed above and not only involved feeding the hosts but gift giving and other mechanisms of material exchange that may mimic trade.²

Evidence for ritual activity at the Davis site is extensive. The material culture at the Davis site includes the ritual landscape of the three mounds and probably other features no longer visible (Darrell Creel, personal communication 2004). It also contains artifacts whose styles and raw materials connect the site to a very broad region extending from the midwestern and southeastern United States to central Texas. Symbolism of power, prestige, and symbolic resonance are amply displayed in the collective form, style, raw material, and graphic symbolism of exotic artifacts. In every case, the items can be regarded as finished goods. Prestige items such as celts, boat stones, and quartz crystals were obtained from the Ouachita Mountains of eastern Oklahoma and southwestern Arkansas, large conch shells came from the Gulf coastal region, a large chert sword and a chunky stone are from the Midwest, spatulate celts originated in the southern Appalachian region, and Gahagan bifaces and arrow points came from central Texas. These exotic items from distant places held their status as “social agents” or “pieces of places” (Spielmann 2004:211). Central Texas was well represented in the tombs by the presence of Edwards chert artifacts and technological styles of Gahagan bifaces and Bonham-Alba arrow points. The accumulation of prestige goods at the site served to emphasize its stature in the Mississippian world and its location at the edge of and gateway to the prairies.

The deep shaft tombs in Mound C were designated for people of prestige, and while the mound additions and sequential interments point to a continuum over a period spanning two to three centuries (Story 1997), the number of individuals interred falls far short of what would be contained in a cemetery of even a moderate population. The high-status individuals were adorned to either meet their deities or as representatives of the deities themselves through symbolic resonance.

There remains little doubt that the Davis site community was stratified to some degree. That it was the seat of a chiefdom remains to be debated. In Service’s (1962:142) classic definition of a chiefdom, such political entities were supported by populations of ca. 5,000–15,000. Whether these estimates can be applied to Caddoan mound centers is debatable, but nevertheless, it takes a sizable population supported by a stable and storable subsistence base for social stratification to occur. My point is: If the Davis site was a chiefdom, where were the people? Kegley’s (1969) survey aimed at locating outlier villages in the site’s vicinity failed to locate even a single one. Creel’s (personal communication 2003) recent investigations have identified many structures evidencing considerable variability in size and form throughout the village. This fascinating investigation has raised many new questions about the site and dissolved many of our previous assumptions regarding the village, Mound B development, and Mound C shape. But if the Davis site did indeed house a very large population as some might argue with the number of structures evident, where are the middens? Given the longevity of site occupation, the patterns that Creel has seen represent palimpsests of

² This was my argument to explain Mimbres Style III pottery in Dona Ana pit house sites acquired while attending Mimbres ceremonies and feasts (Shafer 2003a:192). Furthermore, the assemblage of 13 large jars cached in a large storage room at the NAN Ranch Ruin, including 1 traced using NAA to Chihuahua and another from the Tularosa Basin, are the types of vessels expected in a feasting assemblage. These large jars may have been used to brew corn beer, brewed by the Tarahumara in similar large jars for feasts (Bennett and Zingg 1935).

structures with short use lives. This still leaves open the question: Where were the people? My hypothesis is that at least some of these villages were in the central Texas prairies for basically two reasons: to harvest the prairie resources and to provide a western defensive buffer to the vulnerable frontier position of the Davis site.

What brought people of the prairie to the Davis site? Calendar rituals, elaborate funerals, and social events at the Davis site would have drawn people from many directions. Such events provide a ripe social opportunity for the exchange of material goods, whether as gifts, tribute, trade, or theft. It is simply not possible to distinguish the type of social interaction in the archeological record that resulted in the exchange of material goods (i.e., gifts, tribute, trade, or through theft and plunder). Archeologists can, however, establish the conditions for specific mechanisms of exchange. Speth (1991) and Spielmann (1991) have done this in regards to the mutualistic Pueblo-Plains interaction. Agricultural products, textiles, and ceramics went from west to east, while meat and hides went from east to west. Their archeological modeling is amply supported by ethnographic and historic examples. In the Pueblo-Plains examples, trading fairs, trade encounters, and invited guests to Pueblo ceremonies set the stage for material exchange between the two parties.

There is a difference, however, between the Pueblo-Plains case and that of the prairie-Davis connection. While the eastern Pueblos and Plains groups shared certain styles of material culture due to trade, the same style of material culture was not made by both groups. This, I think, is the fundamental difference between the two types of interaction. The most visible connectors in the prairie and Caddo system were the metapodial beamers and Bonham-Alba points, with ceramics going east to west, and Gahagans going west to east and beyond. Sharing technological styles across the prairie is a better explanation than simple exchange for the similarities of material culture.

Caddoan ceremonies may have attracted people of the prairie to the Davis site, as I have already suggested. Historically among the Caddo, visitors were supplied with lavish gifts and were feasted (Swanton 1942:177, 178). Great feasts were prepared for certain celebrations such as the harvest feast and winter forecasting ceremony. Espinosa's account (cited in Swanton 1942:177) of the harvest feast is specifically informative. It was a dress-up occasion of the year when the finest dress and costume was worn. It was also an occasion when drinks (probably mildly alcoholic) were consumed in quantity. There is mention of a "foamy laural tea" and a drink made of "brewed wild olives served.... in an earthenware vase" (Espinosa 1927:171-174, cited in Swanton 1942:228, 229). This tells us what was served in fancy bottles.

Raw materials introduced to the site from the south (Manning Fused Glass and Catahoula sandstone) and west (finished Gahagan bifaces, Edwards chert nodules for cores, and finished Bonham-Alba arrow points) provide evidence for contact from these geographic regions through social events and occasions probably in the form of calendar ceremonies, feasts, funerals, and possibly even trading fairs.

Davis site Gahagan bifaces were recovered from both villages and tombs (Shafer 1973; Baskin 1981). All of the 64 Davis site specimens are of central Texas chert. There is no evidence that these items were made at the Davis site, since their manufacture would require the artisans to be in the proximity of large chert masses. Lengths of Gahagan bifaces from the site vary from 5.6 to 28 cm, with a mean of 12.9 cm (Shafer 1973:229). Gahagan bifaces from tombs are longer and wider proportionally than are those from village contexts that have been used and resharpened.

The social significance of Gahagan bifaces can be measured through five criteria: (1) rarity of raw material; (2) artifact size; (3) artifact longevity; (4) number of production stages; and (5) restrictiveness of production (Dockall 1992; Gero 1989). Dockall (1992:13, citing Gero 1989:93) also states that artifacts designed to transmit social information would serve two purposes: (1) "as

indicators of social conformity among large population centers, and (2) statements of ethnicity (social belonging) within zones with permeable borders.”

The rarity of chert resources at the Davis site is attested by the fact that all large chert artifacts were imported. Production areas for Gahagan bifaces have been defined in central Texas (Bond 1978; Prewitt 1974; Gadus et al. 2006), and several varieties of Edwards chert are represented in the Davis site sample. Dockall examined eight Davis site specimens and identified three chert types³. Specimen 424-33 compared to Fort Hood tan (Dickens and Dockall 1993); specimen 425-164 compared to Heiner Lake (Dickens 1997); and specimen 4075-15 compared to Georgetown (Banks 1990).

An artifact’s size is directly related to visibility within the social milieu (Dockall 1992; Gero 1989:93). The manufacture of Gahagan bifaces required access to large chert nodules that are unavailable in the Neches River gravels. The nearest sources to the Davis site are the Brazos and Little Rivers, which drain directly out of the Edwards chert-bearing region. Given the size of Gahagan bifaces, they would have been useful in transmitting social information among small groups. Larger specimens would be visible in public settings, however, and may have been powerful symbols of rank.

The size of a newly finished Gahagan biface was probably designed for a long use life. Use as a knife would require an occasional retouch and resharpening, thus reducing its overall size through time. This effect can be seen on certain Gahagan bifaces recovered archeologically. Both Gero (1989) and Wobst (1977:322) state that artifacts with longer use lives are more likely to transmit social information.

The number of production stages and skill required to make a Gahagan biface probably were not something that every Caddoan man could successfully carry out in the heartland. This was an acquired technological style that took a lot of practice, wastage, and time to master. To learn it, one had to have a lot of resource to practice on. Evidence for novice training is usually beyond archeologists’ imagination to define, but it is undoubtedly present at and near resource outcrops. Certainly, there is no evidence that such training was carried out at Davis (Shafer 1973:337–354). The greater the skill and time required to manufacture an artifact, the greater the prestige of its ownership.

Finally, the restrictedness of production enhances the symbolic value simply by the fact that such items are not available to everyone. To acquire one, social commitments of reciprocity likely came into play. Such social commitments simply add symbolic value and prestige to the items exchanged.

The elite at the Davis site were buried either with caches of Gahagan bifaces (Features 119 and 134) or with probably hafted examples as mortuary furniture (Features 118 and 161) (Shafer 1973; Story 1997). Specimens were recovered from houses and scattered refuse around Mound A (Newell and Krieger 1949) and from various locations across the village but mostly in proximity to Mounds A and B (Shafer 1973) in what Story describes as inner precincts (Story 1997). Large prestige examples of Gahagan bifaces also have been recovered from tombs in other early Caddoan mound centers such as Gahagan (Webb and Dodd 1939), Mounds Plantation (Webb and McKinney 1975), and Mineral Springs (Bohannon 1973). A shaft tomb at the Bentsen-Clark site yielded three Gahagan bifaces (Banks and Winters 1975:28). Banks describes the material for two of these as Woodford chert from Oklahoma. This interesting observation suggests that the technological style for Gahagan bifaces was probably well known across the Caddoan world. It is the overall distribution, however,

³ Notes on file with the author.

that provides the central Texas connection. Gahagan bifaces have been reported from Hudnall-Pirtle (41RK4), Pace McDonald, and Boxed Springs (41UR30), all early Caddo mound centers (Tim Perttula, personal communication 2004). The occurrence of Gahagan bifaces at the Davis site village and in early tombs at these and other early Caddoan mound centers convincingly places these artifacts into the hands of the ancient Caddo, both as practical knives and prestige knives. They are clearly part of early Caddoan technological styles.

Restrictedness of production may also apply to something made at the Davis site itself. Part of the technological system for the production of this mysterious item was an interesting concentration of perforators, many made on arrow points (Baskin 1981:276–282). Of the 40 perforators reported, 37 came from Unit 109 in the village area between Mounds B and C. This concentration of items associated with a particular technological system raises the question of cottage-level craft specialization, possibly associated with a technological style of wood or skin working. Interestingly, similar perforators made from arrow points were recovered from 41FT425, the McGuire's Garden site (Gadus et al. 2002:43, 44), and 41GM281, middle Caddoan and early-middle components, respectively.

The large sample of arrow points from the Davis site, which numbers in the hundreds, provides an outstanding comparative sample. The formally defined types Alba, Hayes, Bonham, Perdiz, and Friley have been identified. In this section, I address the variability of the point styles and relate that variability to both east Texas and Prairie Caddo. The comparative sample of points is taken from Shafer (1973) and Baskin (1981), both of whom were working within the typological systems established by Suhm, Krieger, and Jelks (1954). The dominant point styles in the Davis site village are the square-stem Alba (Baskin 1981; Shafer 1973:Figure 14Q–A1, N1–T1) and Bonham-Alba (Baskin 1981; Shafer 1973:Figure 14M, B1–D1); Hayes (Shafer 1973:Figure 14E–J) and Friley (Baskin 1981) points are minor forms. The resident population at the Davis site is affiliated with east Texas Caddo where Alba and Bonham-Alba were the point styles of preference whereas the point style of preference for the Prairie Caddo was Bonham-Alba, and the point styles of preference for the northern Prairie Caddo were Steiner, Friley, and Alba. Locally made Alba and Bonham-Alba at the Davis site have short blades, but I attribute this to the small size of the resources available (chert, fine-grained quartzite, and Manning Fused Glass).

Tomb samples are probably more revealing in terms of style. Feature 134 held a container of 151 arrow points with styles ranging from Bonham-Alba to Alba, all of Edwards chert. The distinguishing factor is the recurved blades. Stems are either rounded (73), convex (53), straight (18), or concave (7). This tight cluster illustrates the concept of technological style well given the variability shown in the stem treatment. Specific attention is directed at the technological style of the blades, since this is the visible part of the point that carries stylistic codes. Blades on some are finely serrated, although the coarse serration found on Bonham-Alba points in the prairie sites is lacking here. A similar stylistic grouping was recovered from Feature 119 as well (Shafer 1973:Figure 15). Shaft tomb Features 161 and 118 also yielded clusters of points that can now be described as Bonham-Alba. Some of these specimens also have finely serrated blades, although most do not.

Bonham-Alba arrow points from both village and mortuary contexts at the Davis site also firmly place this style in the quivers of Caddo hunters and warriors. Raw materials used in the manufacture of Bonham-Alba points are, with two exceptions, of Edwards chert. The exceptions are two quivers of arrows in Feature 118 (Clusters 2 and 5). Cluster 2 was made of Boone chert, and Cluster 5 was of Woodford chert from southeastern Oklahoma (Shafer 1973:203–208). Raw nodules of tan, gray tan, and gray chert obtained from central Texas prairies were transported to the site (Shafer 1973:57, Figure 6H). The patinated, often frost-scarred, cortex of these nodules suggests they were procured from upland rather than gravel exposures. Cores showed that the most common use of these nodules was for the production of wedge-shaped backed flakes, the most common expedient cutting tool in the lithic sample. A small sample of arrow point failures of chert and fine-grained

quartzite (Shafer 1973:Figure 14A–D) indicates that some local manufacture did occur using small imported nodules and local pebble resources.

Testing the Hypothesis

The hypothesis that the Davis site was culturally connected to the prairie area can be tested in several ways, primarily through ceramics. Perhaps the strongest evidence for important social events comes from the inventory of exotic lithic artifacts from distant places that were recovered from tombs and village contexts. People had to bring these items, since many were special items for special occasions. Presentations for these occasions must have included the display of the finest costumes and material accoutrements (Swanton 1942:228).

Other clues for public events may be indicated in the ceramic assemblage. Holly Fine Engraved is the exceptional ware at the Davis site, although it is not the only engraved decorative ware in the assemblage. Holly accounts for 18 percent of the 166 vessel batches recovered from the 1978 excavations at the site, compared to 24 percent of the vessels from the WPA excavations (Thurmond and Kleinschmidt 1979:39). Paying less attention to what Krieger and others call Holly and incorporating other fine engraved vessels, the importance lies in the stylistic codes the fine vessels convey. As Wobst (1977) notes, in social circles, the closer the emitter is to the target audience, the less important are stylistic messages. On the other hand, if the emitter and the target are likely never to meet, it is unlikely the messages will be understood. Translated, Holly and other fine engraved wares were made for show to communicate codes (and probably impress) to a specific target group. People coming from the prairies would probably be wowed by the pottery and other exotic and emblematic artifacts, which merely enhanced the power of the presenter.

Material correlates of feasting behavior might be found in the size of ceramic vessels used (Van Keuren 2004; Spielmann 2004). Holly and other fine engraved wares, I think, constitute a material correlate for feasting and other ceremonies held at the Davis site. The distribution of Holly in prairie sites can be attributed to gift exchange that occurred in context of the public events. One proposed method to test this with Holly and other vessels, especially large cooking jars and serving bowls, is to examine a statistical sample of rim sherds of Davis vessels irrespective of type. To investigate the feasibility of such a test, I used ceramic data provided by Thurmond and Kleinschmidt (1979:Table 14) from Feature 193-1, a large pit east of Mound C in the area where the visitor's center is today. The objective was to establish a ceramic assemblage model to compare with a mound assemblage as a test for evidence of feasting. I included all bowls that had diameter estimates, irrespective of type, to get a sample of 60 vessels. The results show an interesting bimodal distribution of vessel size. One peak includes 36 vessels with diameters of 14–25 cm with the zenith at 18–21 cm, while the other peak includes 10 vessels 35 cm and larger. The 14–25-cm peak is not unexpected and probably represents serving vessels used in small group settings. The second peak, however, includes very large bowls. Thurmond and Kleinschmidt (1979:39) note that Davis Incised bowls are the largest, 20–45 cm in diameter, but one Holly bowl measures 42–50 cm. Large vessels in the 40-cm class also occurred in Crockett and Weches types as well (Thurmond and Kleinschmidt 1979:Table 14). This exercise demonstrated that large bowls that would be expected in a feasting assemblage are present at the Davis site. The feasting hypothesis can be further tested as outlined below.

Bone preservation at the Davis site varied from none to good, depending on the depositional environment. Feature 193-1 yielded the largest and most-informative faunal assemblage recovered from any excavation at the site (Thurmond and Kleinschmidt 1979:Table 1). Deer provided the most meat by far (488 kg of usable meat), compared to a total of 530 kg for all animals. Wild turkey was the next highest contributor with 27 kg, followed by passenger pigeon (5.7 kg). While this assemblage cannot be compared at this time to household assemblages elsewhere, the high representation of deer, turkey, and passenger pigeon could be indicative of feasting events.

Bone preservation also hampers the recovery of bone artifacts at the Davis site. Prestige bone tools were preserved, albeit with considerable effort, from Features 134 and 119. Bone artifacts were recovered from Feature 193-1, however, and provide at least a hint of the bone tool technologies. Fragments of bone pins, a deer ulna awl, two deer ulna flaking (spatulate) implements, and a modified deer metapodial fragment were among the modified bones recovered. Although meager, this bone tool assemblage is informative in that it places deer ulna flaking tools at the Davis site and identifies them as a Caddoan technological style.

The following analytical procedures are suggested as a means of testing the hypothesis that the Davis site was affiliated with the prairie area to the west.

The feasting hypothesis can be tested further at the Davis site using WPA sherds from Mound A and vicinity. Rim diameters would be calculated using a rim sherd curvature chart (cf. Orton et al. 1993:Figure 13.2). The means from the two samples would be compared using a difference in means or the Student's T test. The theory is that the larger the social group being served, especially with the incorporation of ceremonies, the larger will be the vessels (Lyle 1996:77, 78; Turner and Lofgren 1966:126–130). As noted earlier, sherd samples from around Mound A are generally larger and better preserved than are those recovered from later investigations, although Feature 193-1 is an exception. It has been my observation that many vessels from the Davis site are impressively large and are likely candidates for vessels used to serve large social gatherings. This observation is confirmed with the Feature 193-1 data but needs to be further quantified with a sample from Mound A. Krieger (Newell and Krieger 1949:77, 78) notes that 96,000 sherds were recovered from the WPA excavations, but that 40,000 of them were “crumbs.” This leaves about 56,000 sherds of analytical value that he sorted and classified. He estimated the total vessels using the 96,000 sherd count to be between 7,000 and 10,000. This figure is predicated by the fact that, when sherds from houses were counted, 67 percent (4,683 sherds or an estimated 500–550 vessels) came from a single structure, Feature 9. The contents of this feature raise a red flag with regards to ritual deposits, possibly associated with a termination ritual following an important ceremonial occasion (such as a high-status funeral). A close look at the rim sherds from Feature 9 might be a fruitful exercise in testing the feasting theory.

Lipid analysis of ceramics also may provide support for feasting. Marchbanks (1989) demonstrated that lipid analysis could be used to identify residues from pottery at the Davis site. Marchbanks's study was primarily directed toward demonstrating the usefulness of the technique rather than as a test for specific behaviors. Swanton (1942:174) notes that the Natchitoches and Acolapissa had separate vessels for each thing they cooked. Pots for meat, for example, were not used to cook fish. Also, Swanton cites sources that describe possibly two types of drink, a brew made of “wild olives” (wild plums?) and a frothy tea served in bottles. These references would seem to suggest that a problem-oriented lipid analysis testing jars, bowls, and bottles might be very fruitful.

Test to see if larger jars yield different stable carbon isotope ratios, different stable nitrogen isotope ratios, and/or different fatty acid chains than smaller jars. The same tests might be conducted on bottles.

Examine the technological style in ceramics to look for the presence of fine engraved pottery in central Texas collections. The absence of fine engraved pottery would be expected. Central Texas sites are mostly small campsites that were probably short-term hunting and gathering localities. Ceramics in such instances would be for practical rather than presentational purposes. Jars that are either plain or with wet-paste decorations for practical uses around the hearth would be expected. The opposite might be expected at the George C. Davis site where public feasting and ceremonies undoubtedly occurred. Here, as the record shows, some vessels such as Holly Fine Engraved were elaborately decorated for presentational uses in a public arena. In other words, the ceramics would be different between villages, hunting camps, and a civic-ceremonial center because the technological style of use would be different.

A critical need using the Davis site pottery is a baseline NAA analysis for the early Caddoan ceramics from the middle Neches Valley. Limited studies have been done using surface sherds (Tim Perttula, personal communication 2004), but a broad statistical sample is very much needed. Identifying the origin of early Caddoan ceramics in central Texas will be done with greater confidence and precision with a comparative sample from the Davis site.

The Davis site data could then be compared to the ceramic assemblage from a known Prairie Caddoan hamlet as an example of how this should be performed on a broader sample. Early Caddoan vessel rims from Prairie Caddo sites could be compared to the resulting database to see how they conform to the size distribution. My prediction is that Pennington, Weches, and other jar forms would be smaller in central Texas campsites than the upper size range from the Davis site and would compare more closely with that from an early Caddoan hamlet. The single small Weches vessel from the Baylor site (Story and Shafer 1965) fits that expectation, for example. A possible test case would be the rim sherds from the McGuire's Garden site (41FT425) (Gadus et al. 2002). This hamlet is later in time, but possibly overlaps the upper time range set for the Prairie Caddo.

A reexamination of the Davis site lithic collection for source comparisons will be useful. Partial success has already been demonstrated by Dockall's preliminary examination of 10 Davis site Gahagan bifaces, which he compared to known varieties of Edwards chert at Fort Hood, and my own comparison of the biface cache near Mound A with Leona Park chert at Belton Lake. These tests show the project to be feasible, and the results could not only help map out production areas for Gahagan bifaces and possibly arrow point chert sources but could provide targets for investigating prairie and Davis site economics.

TEMPORAL AND SPATIAL COMPARISONS

The proposed Prairie Caddo artifact assemblage can be differentiated from those in the Edwards Plateau on the basis of technological style. Temporally, the distinction between the Prairie Caddo assemblage and the Austin interval is that the latter lacks early Caddoan pottery, Gahagan bifaces, Bonham-Alba points, and beaming tools. Jelks (1962) describes Friday knives as a trait for the Austin focus, and the short, triangular blades do carry some stylistic and technological overlap with Gahagan, but Gahagan bifaces are not a trait of the Austin interval in central Texas prairies.

Knives technologically similar to and stylistically indistinguishable from Gahagan, which I variously termed Gahagan, Gahagan-like, and Gahagan (Friday), were recovered from 41VT8 (Shafer 2006). The term Gahagan-like best describes the 41VT8 specimens, since it could not be demonstrated that they are temporally or spatially related to the Prairie Caddo assemblage. Furthermore, no early Caddoan pottery was recovered from 41VT8, although historic Caddo sherds (Patton Engraved and Poyner Engraved) were in the presidio ceramic assemblage.

Perforators made on arrow points are lacking in the Austin interval assemblage. Also, the Prairie Caddo assemblage lacks serrated flakes and unifacially notched flakes, both of which are Austin interval diagnostics.

To the south and west in the Edwards Plateau, Bonham-Alba arrow points are rare. The point types that occur in the time interval of Bonham-Alba (ca. A.D. 1000 to 1250–1300) are Scallorn and the expanding-stem Sabinal based on radiocarbon dates reported by Turner and Hester (1999:229). These types were quickly replaced by Perdiz at the well-stratified Rainey Sinkhole (Henderson 2001) and at 41HY202-A and 41HY209-T (Ricklis and Collins 1994). The Honey Creek site (41MS32) (Black 1997) yielded Perdiz, Scallorn or Scallorn variants (Edwards), and a plethora of dart point styles in poorly stratified deposits. Farther west, Bonham-Alba are absent at 41TG91 where Perdiz postdates Scallorn and an unnamed square-base arrow point style (Creel 1990).

Carryover to the Toyah interval may include continued occurrence of Caddoan pottery, but the Caddoan pottery consists of middle and late types (Gadus et al. 2002) that are not tied to the Davis site. Locally produced bone-tempered ceramics consist of at least two, and possibly three, technological styles (Doss Red Ware, Booth Brushed, and Leon Plain). Gahagan bifaces do not occur with the Toyah interval, whereas four-edge beveled knives and Perdiz constitute the knife and arrow point styles, respectively. Perforators are made on flakes rather than reworked arrow points. Also, it is important to note that end scrapers are a common hide-working tool of the Toyah interval and represent a different technological style of hide preparation not found in the Prairie Caddo assemblage.

The geographic boundary for the prairie assemblage seems to be about Travis County to the southwest and along the Colorado River and its tributaries. The sample of 56 arrow points from the Millican Bench site (Mauldin et al. 2004), for example, has only 1 Bonham and 1 Alba; the remainder are Scallorn. I chose to lump the corner-notched Scallorn and other variants such as Edwards together in the preliminary Millican Bench analysis because there was no vertical separation. There is a single arrow point that fits the Bonham-Alba style in the collection at Millican Bench (41TV163).

Likewise, the majority of the arrow points recovered from 41TV742 are also Scallorn and Edwards, but the sample also includes Bonham-Alba (termed Alba by the authors), a Gahagan knife base, and a possible fragment of a deer metapodial beamer, although it was too fragmentary to tell for sure (Coffman et al. 1986).

At 41HY290-T, only Scallorn and Perdiz were recovered, with no points identifiable as Bonham-Alba (Ricklis and Collins 1994). A large, thin knife was recovered from the site, which the analyst compared to Gahagan bifaces. While the biface may be in the Gahagan genre, it does not appear to be a finished Gahagan. It lacks the distinctive fine marginal retouch and sharp basal corners of the classic Gahagan style. Additional comparisons relevant to the Prairie Caddo assemblage may be found in Henderson (2001) and Black (1986, 1997).

Prairie Caddo sites or components consist of residential middens that may include burned limestone from earth ovens, mussel shells, snail shells, bone refuse, lithic refuse, ceramics, and daub. The sites fall into two categories: large sites along major stream terraces and small sites along tributaries and up side canyons. The larger sites, such as Asa Warner, Chupik, Urbankte, and possibly Clark, McDonald, and TAMU West Sand Pit may have been villages. The TAMU West Sand Pit site was destroyed, but the landowner salvaged a small collection that is very diagnostic, including a Gahagan knife, a Bonham-Alba point, and an early-style ground stone celt. The most common sites, however, are small middens along major streams (41MM341, 41WM130, and others), along tributary streams (41BL23, 41BL65, Baylor), on bluffs overlooking the confluence of two small streams (many sites at Fort Hood), at the heads of small canyons usually containing springs and tinajas (Grimes-Houy midden, many sites at Fort Hood), and rockshelters (Grimes-Houy midden, many sites at Fort Hood, Hog Creek, Kyle, Blum, Pictograph, Buzzard, among others). The smaller sites are very likely hunting camps, and if so, would yield few ceramics. Ceramic assemblages from the terrace sites are notably larger (Asa Warner, Chupik, McDonald, Urbankte, and other sites reported by Frank Watt [1956]), and at least one (Urbankte) yielded daub. No direct evidence for structures has been found in central Texas, but this may be due to a lack of effort, field techniques, and awareness that such evidence might be found (Shafer et al. 2004).

Prairie Caddo cemeteries occur in both villages (Watt 1956; Wright 1997) and rockshelters (Steele and Olive 1989, 1990; Watt 1936). These single interments are most often flexed on a side and sometimes capped with cairns. Associated artifacts are few, if present at all. This pattern is in contrast to the middle and late Caddoan patterns in the Caddoan heartland, where burials often contain an assortment of grave furniture. It is consistent, however, with the northern Prairie Caddo patterns at Hurricane Hill (Perttula 1998), Cobb-Pool (Peter and McGregor 1988), and Bird Point Island (Bruseth and Martin 1987). Burial 52 at the Asa Warner site reported by Frank H. Watt (1956:10–11, Figures

3, 4-1, 6-1, and 6-2) contained an antler punch, a biface blank, and a base-tang knife (Figure 7). The base-tang knife, possibly made of banded central Texas chert, appears to have been a Late Archaic heirloom based on the technological style. Its placement in the grave, however, suggests it was worn in a sheath, reminiscent of the large stone sword in Feature 134 at the George C. Davis site (Shafer 1973:231–233) and from Skeleton 1 in Burial Pit 1 at Mounds Plantation (Webb and McKinney 1975).

CONTESTED HUNTING GROUNDS

The idea that the Prairie Caddo provided a buffer for Davis site security begs for some empirical evidence of conflict. The Balcones Edge may have been a seriously contested region during the time interval of the Prairie Caddo. Several examples of violence have been documented. The Bonham-Alba point in the rib of one of the Kell Branch skeletons and three arrow points (unclassified) reported with a burial along the Brazos about six miles east of Waco (Aynsworth 1936) provide pretty good evidence, as do the scalped individual at Grimes Houy (Baker 2001:323, Figure 8.5) and the mass burial at Waco (Meroney 1936; Watt and Meroney 1937), which was adorned with a Caddoan ear spool and contained Bonham-Alba point-tipped fatal arrows. Another unreported mass burial was excavated by the late Darl Hill, a commercial collector from Moody, Texas, in a boulder shelter along the Leon River. Hill took me to the site about 1956 after he completed his digging. He described the burial as bodies thrown in, one on top of another. A backdirt pile containing a large quantity of disarticulated human remains and partial skeletons exposed in the crater wall confirmed his descriptions. The only artifact from the burial he recovered and showed me was a single point, which I would class as a Bonham-Alba. Unfortunately, Hill excavated the burial with a trowel and did not screen the fill. Other examples of violence include the broken dart point tip in an adult pelvis at Kell Branch (Baker 2001:308, Figure 8.2) and the arrow wounds in Loeve-Fox burials (Prewitt 1974:46). All suggest the Balcones Edge had long been a contested zone. Evidence of violence should be an integral part of bioarcheological studies.

CONCLUSIONS

The objective of this module is to propose a Late Prehistoric material assemblage in the central Texas prairies that differs from the constructs, Austin and Toyah, currently used in archeological interpretation. The proposed model is presented as a hypothesis for testing, and avenues for testing the hypothesis are offered. This material assemblage is more closely tied to the early Caddoan manifestations at the George C. Davis site than to other currently defined constructs. Technological styles shared between the prairie area and the George C. Davis site include early Caddoan pottery, Gahagan knives, and Bonham-Alba arrow points. early Caddoan pottery in central Texas is traced back to the Davis site based on technological and decorative styles. Gahagan knives were manufactured along the Balcones Edge and prairies of central Texas based on chert comparisons, presence of large chert nodules, and known manufacturing sites



Figure 7. Base-tang knife from Burial 52 at the Asa Warner site.

or locales. Bonham-Alba arrow points of central Texas chert occur across the area from the Balcones Edge and prairies where they were made and, like Gahagan knives, to village and tomb contexts at the Davis site where they appear in finished form. The central Texas prairie assemblage is related to the Caddo based on the presence of deer metapodial beamers. The technological style of deer hide processing using deer metapodial beamers is peculiarly Caddoan and does not occur outside the Caddo area. The use of the tool is in contrast to the technological style involving the use of end scrapers characteristic of the Toyah interval. Therefore, since the Davis site is early Caddo and shares a lithic assemblage of Gahagan knives and Bonham-Alba arrow points with central Texas and beamers are uniquely Caddoan and occur in central Texas, it is my conclusion that the people of the prairie were Caddo.

Research suggestions are offered to test the hypothesis that the prairie assemblage is distinct from that of the Austin and Toyah. The following discussion highlights a protocol for material culture analysis for the Prairie Caddo components. An approach different from the standard descriptive approach to the analysis of material culture is required to implement this module. It does not replace descriptive studies but builds upon them. The process starts with typological analysis and builds from there. For artifact analysis, an active approach is suggested wherein attention is shifted to the artifacts themselves in an effort to glean more information. A shift from an emphasis on artifact type to the technological styles, technological systems of which they were once a part, and the material evidence left behind in carrying out the technological processes is advocated. Current technological studies that relate to tool manufacture and use are necessary in implementing this module. The suggested approach—emphasis on technological style and technological systems—goes beyond the more-passive descriptive approach in which artifacts are classified according to established or folk taxonomies, described, and plotted to see where they fall. The descriptive approach is appropriate for survey, testing, and site assessment studies, and even site reports emphasizing such research issues as temporal and spatial patterning, depending on the level or scale of inquiry. I do not think the descriptive approach is appropriate or possible for inferring behavioral patterns, especially when artifact descriptions follow descriptive/folk taxonomies. I am certainly not advocating eliminating the typological approach from archeological analysis; indeed, I am encouraging more critical attention to detail of style and variability. I wish more archeologists really knew how to apply Turner and Hester's (1999) field guide. My plea is for archeologists to develop more creative and imaginative avenues of material culture study in order to raise the bar of archeological inference. Let me explain.

Current lithic analyses divide finished artifacts, cores, and debitage into separate categories that are analyzed and described separately and are sometimes related in a very general, often elementary, way to the methods and techniques of reduction. For example, core reduction is based on the presence of cores and flakes with cortex. Biface production is inferred by the presence of biface failures and billet or biface-thinning flakes (Johnson 2000:111–113). The manufacture of Castroville and Ensor points both yield biface failures and biface-thinning flakes. These two point types, however, represent different technological styles not counting the formal shapes. The technological style of making a Val Verde is far different from that of a Pandale point or an Ensor point, for example, but these differences have never been addressed, nor have the social implications of such differences. Approaches using technological styles open many new avenues of inquiry. A recent example is the study of variability and technological style of Pedernales points (Tomka et al. 2003). This study looked at and mapped variation in stem form and blade technology among Pedernales points across central Texas. While the interpretative potential of the intriguing Pedernales study findings was not fully explored, the geographic distribution of certain technological styles certainly left room for further inquiry and begged for an explanation as to why such technological differences occurred in the first place.

In the present study, I have defined an assemblage of material culture that stands apart from the Austin and Toyah constructs both temporally and geographically. The prairie area assemblage interdigitates with Austin and Toyah along the Balcones Edge. Dates for the prairie assemblage fall

somewhere about A.D. 1100, from about A.D. 1000 to 1250–1300. This dating is supported by crossdating of early Caddoan pottery, Bonham-Alba arrow points, and Gahagan bifaces at the Davis site (Story 2000). Future investigations may show some continuities between the prairie area assemblage and the Austin interval material culture in terms of the temporal depth of the technological styles of arrow point and knife manufacture. Formal knives such as Friday should be expected in Austin interval assemblages since arrow points, unlike dart points, are not sufficient to serve as knives. In my discussion of Gahagan knives, I did not rule out the possibility that Friday knives may have been a forebear to Gahagan, although the developed style of the latter is clearly different. Likewise, continued Caddoan presence in central Texas is documented ethnographically, and the prairie area beyond the Trinity and Brazos (?) Rivers was a designated late Caddo hunting ground (Perttula 1992:26). Middle and late Caddoan pottery, including elbow pipes, at McGuire's Garden (Gadus et al. 2002), Grimes Houy midden, Ament Shelter (Miller and Jelks 1952), 41CV41-A (Mehalchick 2003), and other sites in the prairie and along the Balcones Edge deserve to be mentioned. Late Caddoan pottery occurs with Perdiz arrow points, but the technological style of this point type deserves separate attention. A comparison of the points typed as Perdiz from McGuire's Garden (Gadus et al. 2002) and 41GM281 and 41GM282 in Grimes County (Rogers 1995) to those reported from Buckhollow (Johnson 1994:Figures 38, 39), Rainey Sinkhole (Henderson 2001), and 41TG91 (Creel 1990:Figures 40, 41) illustrates considerable regional stylistic variability within the type. Just how the late Caddoan material culture fits into the notion of Toyah is a different, albeit related, study apart from this module.

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REFERENCES CITED

- Abbott, J. T., and W. N. Trierweiler (editors)
1995 *NRHP Significance Testing of 57 Prehistoric Archeological Sites on Fort Hood, Texas, Vol. 2*. Archeological Resource Management Series, Research Report No. 34. United States Army, Fort Hood.
- Aten, L. E.
1983 *Indians of the Upper Texas Coast*. Academic Press, New York.
- Aynesworth, K. H.
1936 Flint Arrowhead Wounds of Bones as Shown in Skeletons in Central Texas. *Central Texas Archeological Society* 2:74–79.
- Baker, Joan
2001 No Golden Age of Peace: A Biological Investigation of Interpersonal Violence on the West Gulf Coast Plain. Ph.D. dissertation, Department of Anthropology, Texas A&M University, College Station.
- Banks, L. D.
1990 *From Mountain Peaks to Alligator Stomachs: A Review of Lithic Sources in the Trans-Mississippi South, the Southern Plains, and Adjacent Southwest*. Memoir No. 4. Oklahoma Anthropological Society, Norman.
- Banks, L. D., and J. Winters
1975 *The Bentsen-Clark Site, Red River County, Texas: A Preliminary Report*. Special Publication No. 2. Texas Archeological Society, San Antonio.
- Baskin, Barbara
1981 Lithic and Mineral Artifacts. In *Archeological Investigations at the George C. Davis Site, Cherokee County, Texas: Summers of 1979–1980*, edited by Dee Ann Story, pp. 239–320. Occasional Papers No. 1. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Bement, L. C.
1994 *Hunter-Gatherer Mortuary Practices During the Central Texas Archaic*. University of Texas Press, Austin.
- Bennett, W. C., and R. M. Zingg
1935 *The Tarahumara: An Indian Tribe of Northern Mexico*. Rio Grande Press, Glorieta, New Mexico.
- Bell, R. E., E. B. Jelks, and W. W. Newcomb (assemblers)
1967 A Pilot Study of Wichita Indian Archaeology and Ethnohistory. Final Report for Grant GS-964, National Science Foundation, Austin.
- Berlandier, Jean Louis
1969 *The Indians of Texas in 1830*. Smithsonian Institution Press, Washington, D.C.
- Black, S. L.
1986 *The Clemente and Hermina Hinojosa Site, 41JW8: A Toyah Horizon Campsite in Southern Texas*. Special Report No. 18. Center for Archaeological Research, The University of Texas at San Antonio.
1997 The Honey Creek Site, 41MS32. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*, by S. L. Black, L. W. Ellis, D. G. Creel, and G. T. Goode, pp. 99–168. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 2. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Bohannon, C. F.
1973 *Excavations at the Mineral Springs Site*. Research Series No. 5. Arkansas Archeological Survey, Fayetteville.
- Bond, Clell
1978 *Three Archeological Sites at Hoxie Bridge, Williamson County, Texas*. Report No. 43. Texas A&M Research Foundation, College Station.
- Boyd, Douglas K.
2001 Querechos and Teyas: Protohistoric Hunters and Gatherers in the Texas Panhandle-Plains, A.D. 1540–1700. *Bulletin of the Texas Archeological Society* 72:5–22.
- Brewington, R. L., J. E. Dockall, and H. J. Shafer
1995 *Archaeology of 41MX5: A Late Prehistoric Caddoan Hamlet in Morris County, Texas*. Reports of Investigations No. 1. Center for Environmental Archaeology, Texas A&M University, College Station.

- Brown, David O.
1987 Aquilla Lake: A Culture History Perspective. In *Archeology at Aquilla Lake, 1978–1982 Investigations, Vol. 3*, compiled by David O. Brown, pp. 44-1 through 44-31. Research Report 81. Texas Archeological Survey, The University of Texas at Austin.
- Brown, David O., R. Watson, D. Peter, and V. Rawn-Schatzinger
1987 The McDonald Site, 41HI105. In *Archeology at Aquilla Lake, 1978–1982 Investigations, Vol. 2*, compiled by David O. Brown, pp. 38-1 through 38-145. Research Report 81. Texas Archeological Survey, The University of Texas at Austin.
- Brown, James A.
1996 *The Spiro Ceremonial Center: The Archaeology of Arkansas Valley Caddoan Culture in Eastern Oklahoma Vol. 2*. Memoirs of the Museum of Anthropology 29. University of Michigan, Ann Arbor.
- Bruseth, J. E., and W. A. Martin (editors)
1987 *The Bird Point Island and Adams Ranch Sites: Methodological and Theoretical Contributions to North Central Texas Archaeology*. Richland Creek Technical Series, Vol. 2. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.
- Clark, J. J.
2004 Tracking Cultural Affiliation: Enculturation and Ethnicity. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, edited by B. J. Mills, pp. 42–73. University of Colorado Press, Boulder.
- Coffman, R. J., M. C. Trachte, and M. B. Collins
1986 *Cultural Ecology of the Kenyon Rockshelter and the Cunningham Site, Canyon Creek Development, Travis County, Texas*. Reports of Investigations No. 53. Prewitt and Associates, Inc., Austin.
- Collins, M. B.
1995 Forty Years of Archeology in Central Texas. *Bulletin of the Texas Archeological Society* 66:361–400.
1998 Background to the Archeological Investigations. In *Wilson-Leonard, An 11,000-Year Archeological Record of Hunter-Gatherers in Central Texas, Vol. 1: Introduction, Background, and Synthesis*, edited by M. B. Collins, pp. 55–68. Studies in Archeology 31. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeology Studies Program, Report 10. Texas Department of Transportation, Environmental Affairs Division, Austin.
1999 *Clovis Blade Technology*. University of Texas Press, Austin.
- Creel, D. G.
1990 *Excavations at 41TG91, Tom Green County, Texas*. Publications in Archaeology, Report No. 38. Texas State Department of Highways and Public Transportation, Highway Design Division, Austin.
- Davis, E. M.
1961 Proceedings on the Fourth Conference on Caddoan Archeology. *Bulletin of the Texas Archeological Society* 30:1–35.
- Davis, M. W., D. K. Utley, S. A. Tomka, and S. A. Turpin
1987 *Continuing Cultural Resource Investigations in the Calvert Prospect: The 1986 Season, Robertson County, Texas*. Research Report 95. Texas Archeological Survey, The University of Texas at Austin.
- Derrick, Sharon M., and Diane Wilson
1997 Cranial Modeling as an Ethnic Marker Among the Prehistoric Caddo. *Bulletin of the Texas Archeological Society* 68:139–146.
- Dickens, W. A.
1993 Lithic Artifact Analysis. In *Archaeological Investigations in Spicewood Creek: Results of the 1991 Summer Archaeological Field School*, edited by D. L. Carlson, pp. 75–111. Archaeological Resource Management Series, Report No. 22. United States Army, Fort Hood.
1997 Lithic Artifact Analysis. In *Archaeological Investigation Along Owl Creek: Results of the 1992 Summer Archaeological Field School*, edited by D. L. Carlson, pp. 45–68. Archaeological Resource Management Series, Research Report No. 29. United States Army, Fort Hood.
- Dickens, W. A., and J. E. Dockall
1993 Lithic Analysis. In *Archaeological Site Testing and Evaluation on the Henson Mountain Helicopter Range AWSS Project Area, Fort Hood, Texas*, edited by D. L. Carlson, pp. 61–82. Archaeological Resource Management Series, Research Report No. 26. United States Army, Fort Hood.
- Dietler, Michael, and Brian Hayden (editors)
2001a *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*. Smithsonian Institution Press, Washington, D.C.

- 2001b Digesting the Feast—Good to Eat, Good to Drink and Good to Think: An Introduction, In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Dietler and B. Hayden, pp. 1–22. Smithsonian Institution Press, Washington, D.C.
- Dobres, Marcia-Anne, and C. R. Hoffman
 1994 Social Agency and the Dynamics of Prehistoric Technology. *Journal of Archaeological Method and Theory* 1(3):211–258.
- Dockall, J. E.
 1992 The Manufacture and Exchange of Gahagan Bifaces in Texas. Manuscript on file with the author, San Antonio.
- Dockall, J. E., and H. D. Dockall
 1999 Knapping Implements in Mortuary Context: A Case from Morhiss (41VT1) with Comparative Data from Texas and the Midcontinent. *Bulletin of the Texas Archeological Society* 70:547–562.
- Ellis, L. W., G. L. Ellis, and C. D. Frederick
 1995 Implications of Environmental Diversity in the Central Texas Archeological Region. *Bulletin of the Texas Archeological Society* 66:401–426.
- Ensor, H. Blaine
 1988 Prehistoric Material Culture Discussion. Appendix IV in *Archaeological Survey at Fort Hood, Texas, Fiscal Year 1985: The Northwestern Perimeter*, by Joan K. Koch, Catherine Mueller-Wille, and Frederick L. Briuer, pp. 169–192. Fort Hood Archaeological Resource Management Series, Research Report No. 16. United States Army, Fort Hood.
- Ensor, H. Blaine, and David L. Carlson
 1988 *The Crawford Site, 41PK69: Central Trinity River Uplands, Polk County, Texas*. Contract Reports in Archaeology, Report No. 4. Texas State Department of Highways and Public Transportation, Highway Design Division, Austin.
- Espinosa, Fray Isidro Felix de
 1927 Descriptions of the Tejas or Asinai Indians, 1691–1722. Translated from the Spanish by Mattie Austin Hatcher. *Southwestern Historical Quarterly* 31:150–180.
- Fields, R. C.
 1995 The Archeology of the Post Oak Savannah of East Central Texas. *Bulletin of the Texas Archeological Society* 66:301–330.
- Foster, William (ed.)
 1998 *The LaSalle Expedition to Texas: The Journal of Henri Joutel 1684–1687*. Texas Historical Association, Austin.
- Gadus, E. F., R. C. Fields, and K. W. Kibler
 2006 *Data Recovery Excavations at the J. B. White Site (41MM341), Milam County, Texas*. Reports of Investigations No. 145. Prewitt and Associates, Inc., Austin. Archeological Studies Program, Report No. 87. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Gadus, E. F., J. K. McWilliams, and R. C. Fields
 2002 *Data Recovery Excavations at the McGuire's Garden Site (41FT425), Jewett Mine, Freestone County, Texas*. Reports of Investigations No. 134. Prewitt and Associates, Inc., Austin.
- Geib, P. R.
 2004 AMS Dating of a Basketmaker II Hunter's Bag (Cache 1) from Sand Dune Cave, Utah. *Kiva* 69(3):271–282.
- Gero, J. M.
 1989 Assessing Social Information in Material Objects: How Well Do Lithics Measure Up? In *Time, Energy, and Stone Tools*, edited by R. Torrence, pp. 92–105. Cambridge University Press, New York.
- Goode, G. T.
 2002 *The Anthon Site: A Prehistoric Encampment in Southern Uvalde County, Texas*. Archeology Studies Program, Report 38. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Griffen, W. B.
 1969 *Culture Change and Shifting Populations in Central Northern Mexico*. Anthropological Papers of the University of Arizona 13. The University of Arizona Press, Tucson.
- Griffith, W. J.
 1954 The Hasinai Indians of East Texas as Seen by Europeans, 1687–1772. *Philological and Documentary Studies* 2(3):41–168. Middle American Research Institute, Tulane University, New Orleans.

- Hall, G. D.
2002 *Archaeology at the Crestmont Site*. General Investigations Report 1. Archaeology Laboratory, Texas Tech University, Lubbock.
- Hayden, Brian
2001 Fabulous Feasts: A Prolegomenon to the Importance of Feasting. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by Michael Dietler and Brian Hayden, pp. 23–64. Smithsonian Institution Press, Washington, D.C.
- Hegmon, Michelle
1998 Technology, Style, and Social Practices: Archaeological Approaches. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 264–279. Smithsonian Institution Press, Washington, D.C.
- Henderson, J.
1995 Analysis of Bone Tools. In *The Deshazo Site, Nacogdoches County, Texas, Vol. 2, Artifacts of Native Manufacture*, edited by D. A. Story, pp. 7–11. Studies in Archeology 21. Texas Archeological Research Laboratory, The University of Texas at Austin.

2001 *Excavations at the Rainey Site (41BN33), A Late Prehistoric Sinkhole in Bandera County, Texas*. Archeological Studies Program, Report 5. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Henry, D. O., and F. E. Kirby
1980 Typological Analysis. In *The Prehistory of Hog Creek: An Archeological Investigation of Bosque and Coryell Counties, Texas*, by D. O. Henry, F. E. Kirby, A. B. Justen and T. R. Hays, pp. 125–234. Laboratory of Archeology, Department of Anthropology, University of Tulsa.
- Hester, T. R., and R. Parker
1970 The Berclair Site: A Late Prehistoric Component in Goliad County, Texas. *Bulletin of the Texas Archeological Society* 41:1–24.
- Highley, C. L.
1985 Modified Bone and Antler. In *The Panther Springs Creek Site: Cultural Change and Continuity in the Upper Salado Creek Watershed, South-Central Texas*, by S. L. Black and A. J. McGraw, pp. 199–208. Archaeological Survey Report No. 100. Center for Archaeological Research, The University of Texas at San Antonio.
- Holmes, W. H.
1894 Natural History of Flake Stone Implements. *Memoirs, International Congress of Anthropology, Chicago* 1894:120–139.
- Howells, R. G., J. Neel-Hartman, and S. A. Wagner
2003 Appendix G: Freshwater Mussel Shell from 41MM340. In *Data Recovery Excavations at 41MM340, A Late Archaic Site Along Little River in Milam County, Texas*, by R. B. Mahoney, S. A. Tomka, R. P. Mauldin, H. J. Shafer, L. C. Nordt, R. D. Greaves, and R. R. Galdeano, pp. 245–270. Archaeological Survey Report No. 340. Center for Archaeological Research, The University of Texas at San Antonio. Archeological Studies Program, Report 54. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Irvine, Marilee, and Daniel E. McGregor
1987 Excavations of 41NV173, Little Cedar Creek Site. In *Hunter-Gatherer Adaptations Along the Prairie Margin: Site Excavations and Synthesis of Prehistoric Archeology*, edited by D. E. McGregor and J. E. Bruseh, pp. 97–123. Richland Creek Technical Series, Vol. 3. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.
- Jelks, E. B.
1953 Excavations at the Blum Rockshelter. *Bulletin of the Texas Archeological Society* 24:189–207.

1962 *The Kyle Site: A Stratified Central Texas Aspect Site in Hill County, Texas*. Archeology Series 5. Department of Anthropology, The University of Texas at Austin.

1965 *The Archeology of McGee Bend Reservoir, Texas*. Ph.D. dissertation, Department of Anthropology, The University of Texas at Austin.
- Jenkins, Richard
1996 *Social Identity*. Routledge, London.
- Johnson, L., Jr.
1989 Classification of Stone Projectile Points by a Small Texan Folk Community: A Case Study. *Texas Journal of Science* 41(2):193–203.

- 1994 *The Life and Times of the Toyah-Culture Folk as Seen from the Buckhollow Encampment, Site 41KM16, of Kimble County, Texas*. Office of the State Archeologist Report 38. Texas Department of Transportation and Texas Historical Commission, Austin.
- 2000 *Life and Death as Seen at the Bessie Kruze Site (41WM13) on the Blackland Prairie of Williamson County, Texas*. Archeology Studies Program, Report 22. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Kegley, George
1969 Survey and Reconnaissance of Cherokee and Adjacent Counties, 1969. Manuscript on file at the Texas Archeological Research Laboratory, The University of Texas at Austin.
- Kelley, J. C.
1986 *Jumano and Patarabuyeye, Relations at La Junta de los Rios*. Anthropological Papers No. 77. Museum of Anthropology, University of Michigan, Ann Arbor.
- Kleinschmidt, Ulrich
1982 Review and Analysis of the A. C. Saunders Site, 41AN19, Anderson County, Texas. M.A. thesis, Department of Anthropology, The University of Texas at Austin.
- Krieger, A. D.
1944 The Typological Concept. *American Antiquity* 9:271–288.

1946 *Culture Complexes and Chronology in Northern Texas with Extension of Pueblo Dating to the Mississippi Valley*. The University of Texas Publication 4640. The University of Texas at Austin.
- Lechtman, Heather
1977 Style in Technology—Some Thoughts. In *Material Culture: Styles, Organization, and Dynamics of Technology*, edited by Heather Lechtman and Robert Merrill, pp. 3–20. West Publishing Co., St. Paul.
- Lemonnier, P.
1986 The Study of Material Culture Today: Towards an Anthropology of Technical Systems. *Journal of Anthropological Archaeology* 5:147–186.
- Locke, Charles E.
1975 An Approach to X-Ray Diffraction Analysis of Prehistoric Ceramics. Manuscript on file at the Texas Archeological Research Laboratory, The University of Texas at Austin.
- Lyle, Robyn P.
1996 Functional Analysis of Mimbres Ceramics from the NAN Ruin (LA15049), Grant County, New Mexico. M.A. thesis, Department of Anthropology, Texas A&M University, College Station.
- Mallouf, Michael G.
1979 *Archeological Investigations at Lake Limestone, Fall and Winter 1977*. Research Report No. 71. Texas Archeological Survey, The University of Texas at Austin.
- Marchbanks, M. L.
1989 Lipid Analysis in Archaeology: An Initial Study of Ceramics and Subsistence at the George C. Davis Site. M.A. thesis, Department of Anthropology, The University of Texas at Austin.
- Mauldin, R. P., S. A. Tomka, and H. J. Shafer
2004 *Millican Bench (41TV163): A Multicomponent Site in Travis County, Texas*. Archaeological Survey Report No. 351. Center for Archaeological Research, The University of Texas at San Antonio. Archeological Studies Program, Report No. 66. Texas Department of Transportation, Environmental Affairs Division, Austin.
- McClurkan, B. B.
1968 *Livingston Reservoir, 1965–66: Late Archaic and Neo-American Occupations*. Papers of the Texas Archeological Salvage Project 12. The University of Texas at Austin.
- McGregor, Daniel E.
1987 Lithic Artifacts. In *The Bird Point Island and Adams Ranch Sites: Methodological and Theoretical Contributions to North Central Texas Archeology*, edited by J. E. Bruseth and W. A. Martin, pp. 95–108. Richland Creek Technical Series, Vol. 2. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.
- Mehalchick, Gemma
2003 Analysis of Material Recovered. In *Geoarcheological Investigations and National Register Testing of 57 Prehistoric Archeological Sites on Fort Hood, Texas: The 1999 Season*, by Gemma Mehalchick, Kyle Killian, S. Christopher Caran, and Karl W. Kibler, pp. 227–245. Archeological Resource Management Series, Research Report No. 44. United States Army, Fort Hood.

- Meroney, W. P.
1936 A Mass Burial Near Waco. *Bulletin of Central Texas Archeological Society* 2:59–60.
- Miller, E. O., and E. B. Jelks
1952 Archeological Investigations at the Belton Reservoir, Coryell County, Texas. *Bulletin of the Texas Archeological and Paleontological Society* 23:168–217.
- Mills, Barbara J.
2004 Identity, Feasting, and the Archaeology of the Greater Southwest. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, edited by B. J. Mills, pp. 1–23. University of Colorado Press, Boulder.
- Moore, C. B.
1912 Some Aboriginal Sites on Red River. *Journal, Academy of Natural Sciences of Philadelphia* 14: 4.
- Nassaney, M. S., and K. Pyle
1999 The Adoption of the Bow and Arrow in Eastern North America: A View from Central Arkansas. *American Antiquity* 64(2):243–263.
- Nelson, B. A., and R. Anyon
1996 Fallow Valleys: Asynchronous Occupations in Southwestern New Mexico. *Kiva* 61(3):275–294.
- Newcomb, W. W., Jr.
1961 *The Indians of Texas: From Prehistoric to Modern Times*. University of Texas Press, Austin.
- Newell, H. P., and A. D. Krieger
1949 *The George C. Davis Site, Cherokee County, Texas*. Memoirs No. 5. Society for American Archaeology, Menasha, Wisconsin.
- Orton, C., P. Tyers, and A. Vince
1993 *Pottery in Archaeology*. Cambridge Manuals in Archaeology, Cambridge University Press, Cambridge.
- Pauketat, T. R.
2004 *Ancient Cahokia and the Mississippians*. Cambridge University Press, Cambridge.
- Perttula, T. K.
1992 “The Caddo Nation”: *Archaeological and Ethnohistoric Perspectives*. University of Texas Press, Austin.
1995 The Archeology of the Pineywoods and Post Oak Savanna of Northeast Texas. *Bulletin of the Texas Archeological Society* 66:331–360.
1999 *The Hurricane Hill Site (41HP106): The Archaeology of a Late Archaic / Early Ceramic and Early–Middle Caddoan Settlement in Northeast Texas, Vol. 1*. Special Publication No. 4. Friends of Northeast Texas Archaeology, Pittsburg, Texas.
2001 “The Great Kingdom of the Tejas”: The Life and Times of Caddo Peoples in Texas Between ca. 1530–1859. *Bulletin of the Texas Archeological Society* 72:73–90.
- Perttula, T. K., S. A. Iruegas, and H. Neff
2003 *Caddoan Pottery in Central Texas: Geochemical Analysis of Ceramics from Fort Hood and Vicinity*. Archeological Resource Management Series, Research Report No. 51. United States Army, Fort Hood.
- Peter, D. E., and D. E. McGregor (editors)
1988 *Late Holocene Prehistory of the Mountain Home Drainage*. Joe Pool Lake Archaeological Project, Vol. 1. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.
- Powell, J. F.
1994 Bioarchaeological Analysis of Human Skeletal Remains from the Mitchell Ridge Site. In *Aboriginal Life and Culture on the Upper Texas Coast: Archaeology at the Mitchell Ridge Site, 41GV66, Galveston County, Texas*, by R. A. Ricklis, pp. 287–405. Coastal Archaeological Research, Inc., Corpus Christi, Texas.
- Prewitt, E.
1974 *Archeological Investigations at the Loeve-Fox Site, Williamson County, Texas*. Research Report 49. Texas Archeological Survey, The University of Texas at Austin.
1981 Cultural Chronology in Central Texas. *Bulletin of the Texas Archeological Society* 52:65–89.
1985 From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society* 54:201–218.

- 1995 The Distribution of Typed Projectile Points in Texas. *Bulletin of the Texas Archeological Society* 66:83–174.
- Redder, Albert J.
1985 Horn Shelter Number 2: The South End. *Central Texas Archeologist* 10:37–66.
- Ricklis, R. A.
1995 Prehistoric Occupation of the Central and Lower Texas Coast: A Regional Overview. *Bulletin of the Texas Archeological Society* 66:265–300.
1996 *The Karankawa Indians of Texas: An Ecological Study of Cultural Tradition and Change*. University of Texas Press, Austin.
- Ricklis, R. A., and M. B. Collins
1994 *Archaic and Late Prehistoric Human Ecology in the Middle Onion Creek Valley, Hays County, Texas*. Studies in Archeology 19. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Ringstaff, Christopher W., and Gemma Mehalchick
2003 Cultural Materials Recovered. In *National Register Testing of 19 Prehistoric Archeological Sites on Fort Hood, Texas: The 2000–2001 Season*, by Gemma Mehalchick, Karl W. Kibler, Amy H. Holmes, Christopher W. Ringstaff, and Douglas K. Boyd, pp. 169–186. Archeological Resource Management Series, Research Report No. 47. United States Army, Fort Hood.
- Roemer, E., Jr., and Shawn B. Carlson
1987 *Excavations at 41BU16: State Highway 21 at the Brazos River, Burleson County, Texas*. Contract Reports in Archaeology, Report No. 1. Texas State Department of Highways and Public Transportation, Highway Design Division, Austin.
- Rogers, Robert
1995 *Excavations at Sites 41GM166, 41GM281, and 41GM282 at the Gibbons Creek Lignite Mine, Grimes County, Texas*. Document No. 940611. Espy, Huston and Associates, Inc., Austin.
- Ross, R. E.
1966 *The Upper Rockwall and Glen Hill Sites, Forney Reservoir, Texas*. Papers of the Texas Archeological Salvage Project 9. The University of Texas at Austin.
- Schambach, F. F.
1998 *Pre-Caddoan Cultures in the Trans-Mississippi South*. Research Series 53. Arkansas Archeological Survey, Fayetteville.
- Service, E. R.
1962 *Primitive Social Organization: An Evolutionary Perspective*. Random House, New York.
- Shafer, H. J.
1968 *Archeological Investigations in the San Jacinto River Basin, Montgomery County, Texas*. Papers of the Texas Archeological Salvage Project 13. The University of Texas at Austin.
1973 Lithic Technology at the George C. Davis Site, Cherokee County, Texas. Ph.D. dissertation, Department of Anthropology, The University of Texas at Austin.
1985 A Technological Study of Two Maya Workshops at Colha, Belize. In *Stone Tool Analysis: Essays in Honor of Don E. Crabtree*, edited by M. G. Plew, J. C. Woods, and M. G. Pavesic, pp. 277–316. University of New Mexico Press, Albuquerque.
1986 *Ancient Texans: Rockart and Lifeway Along the Lower Pecos*. Texas Monthly Press, Austin.
2003a *Mimbres Archaeology at the NAN Ranch Ruin*. University of New Mexico Press, Albuquerque.
2003b “Shocking New Interpretations from Old Projects: The Davis Site and Central Texas Connections.” Paper presented at the Annual Meeting of the Texas Archeological Society, Fort Worth.
2006 Prehistoric Artifacts. In *Excavations at Presidio Nuestra Señora de Loreto de la Bahía el Espíritu Santo*, by Anne A. Fox and Steve A. Tomka, pp. 33–159. *Bulletin of the Texas Archeological Society* 77:95–123.
- Shafer, H. J., E. P. Baxter, T. B. Sterns, and J. P. Dering
1975 *An Archeological Assessment of the Big Thicket National Preserve*. Anthropology Research Laboratory Report 19. Texas A&M University, College Station.
- Shafer, H. J., D. A. Story, and J. D. Scurlock

- 1964 *An Investigation and Appraisal of the Archeological Resources of Belton Reservoir, Bell and Coryell Counties, Texas: 1962*. Miscellaneous Papers No. 1. Texas Archeological Salvage Project, The University of Texas at Austin.
- Shafer, H. J., S. A. Tomka, and R. P. Mauldin
 2004 Chapter 9: Exploration of Feature 3, A Possible Late Prehistoric Structure at Milican Bench, in *Milican Bench (41TV163): A Multicomponent Site in Travis County, Texas*, by R. P. Mauldin, S. A. Tomka, and H. J. Shafer, pp. 97–106. Archaeological Survey Report No. 351. Center for Archaeological Research, The University of Texas at San Antonio. Archeological Studies Program, Report No. 66. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Skinner, S. Alan, and Deborah T. Connors
 1979 *Archeological Investigations at Lakeview Lake*. Research Report 118. Archaeology Research Program, Southern Methodist University, Dallas.
- Smith, J. E., II
 1994 Lemens Rockshelter (41SV60), a Late Prehistoric Site in Somervell County, Texas. *Bulletin of the Texas Archeological Society* 65:207–256.
- Sorrow, W. M.
 1966 *The Pecan Springs Site, Bardwell Reservoir, Texas*. Papers of the Texas Archeological Salvage Project 10. The University of Texas at Austin.
- Speth, J. D.
 1991 Some Unexplored Aspects of Mutualistic Plains-Pueblo Food Exchange. In *Farmers, Hunters, and Colonists: Interaction Between the Southwest and the Southern Plains*, edited by K. A. Spielmann, pp. 18–35. The University of Arizona Press, Tucson.
- Spielmann, K. A.
 1991 Coercion or Cooperation? Plains-Pueblo Interaction in the Protohistoric Period. In *Farmers, Hunters, and Colonists: Interaction Between the Southwest and the Southern Plains*, edited by K. A. Spielmann, pp. 36–50. The University of Arizona Press, Tucson.
 2004 Communal Feasting, Ceramics, and Exchange. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, edited by B. J. Mills, pp. 210–232. University of Colorado Press, Boulder.
- Steele, D. G., and B. Olive
 1989 Bioarcheology in Region Three Study Area. In *From the Gulf Coast to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos*, by T. R. Hester, S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. J. Reinhard, and L. C. Bement, pp. 93–114. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.
 1990 Bioarcheology of the Western Portion of the Gulf Coastal Plain. In *The Archeology and Bioarcheology of the Gulf Coastal Plain: Vol. 2*, by D. A. Story, J. A. Guy, B. A. Burnett, M. D. Freeman, J. C. Rose, D. G. Steele, B. W. Olive, and K. J. Reinhard, pp. 149–162. Research Series No. 38. Arkansas Archeological Survey, Fayetteville.
- Stephenson, R. L.
 1952 The Hogge Bridge Site and the Wylie Focus. *American Antiquity* 17:299–312.
 1970 Archeological Investigations in the Whitney Reservoir Area, Central Texas. *Bulletin of the Texas Archeological Society* 41:37–276.
- Story, D. A.
 1965 The Archeology of Cedar Creek Reservoir, Henderson and Kaufman Counties, Texas. *Bulletin of the Texas Archeological Society* 36:163–258.
 1990 Culture History of the Native Americans. In *The Archeology and Bioarcheology of the Gulf Coastal Plain: Vol. 1*, by D. A. Story, J. A. Guy, B. A. Burnett, M. D. Freeman, J. C. Rose, D. G. Steele, B. W. Olive, and K. J. Reinhard, pp. 163–366. Research Series No. 38. Arkansas Archeological Survey, Fayetteville.
 1997 1968–1970 Archeological Investigations at the George C. Davis Site, Cherokee County, Texas. *Bulletin of the Texas Archeological Society* 68:1–103.
 2000 Introduction. In *The George C. Davis Site, Cherokee County, Texas, Second Edition*, by H. Perry Newell and Alex D. Krieger. Society for American Archeology, Washington, D.C.
- Story, D. A., and H. J. Shafer
 1965 *1964 Excavations at Waco Reservoir, McLennan County, Texas: The Baylor and Britton Sites*. Miscellaneous Papers No. 6. Texas Archeological Salvage Project, The University of Texas at Austin.

- Suhm, D. A., A. D. Krieger, and E. B. Jelks
1954 An Introductory Handbook to Texas Archaeology. *Bulletin of the Texas Archeological Society* 25.
- Swanton, J. R.
1942 *Source Material on the History and Ethnology of the Caddo Indians*. Bulletin 132. Smithsonian Institution, Bureau of American Ethnology, United States Government Printing Office, Washington, D.C.
- Taylor, A. J., and C. L. Highley
1995 *Archeological Investigations at the Loma Sandia Site (41LK28): A Prehistoric Cemetery and Campsite in Live Oak County, Texas*. Studies in Archeology 20. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Thurmond, J. P., and U. Kleinschmidt
1979 *Report on the Fall 1978 Investigations at the George C. Davis Site, Caddoan Mounds State Historic Site, Cherokee County, Texas*. Texas Archeological Research Laboratory, The University of Texas at Austin.
- Tomka, Marybeth S. F.
1995 Lithic Tools and Other Artifacts. In *NRHP Significance Testing of 57 Prehistoric Archeological Sites on Fort Hood, Texas, Vol. 2*, edited by James T. Abbott and W. Nicholas Trierweiler, pp. 734–764. Archeological Resource Management Series, Research Report No. 34. United States Army, Fort Hood.
1996 Artifact Analysis. In *Archeological Testing at Fort Hood: 1994–1995, Vol. 2*, edited by W. Nicholas Trierweiler, pp. 527–576. Archeological Resource Management Series, Research Report No. 35. United States Army, Fort Hood.
- Tomka, S. A., and K. Kleinbach
1999 Analysis of Materials Recovered. In *National Register Testing of 19 Prehistoric Archeological Sites at Fort Hood, Texas: The 1995 Season*, by G. Mehalchick, K. Kleinbach, D. K. Boyd, S. A. Tomka, and K. W. Kibler, pp. 159–201. Archeological Resource Management Series, Research Report No. 37. United States Army, Fort Hood.
- Tomka, S. A., H. J. Shafer, and R. P. Mauldin
2003 Lithic Technology at 41MM340. In *Data Recovery Excavations at 41MM340, a Late Archaic Site Along the Little River in Milam County, Texas*, by R. B. Mahoney, S. A. Tomka, R. P. Mauldin, H. J. Shafer, L. C. Nordt, R. C. Greaves, and R. R. Galdeano, pp. 133–154. Archeological Survey Report No. 340. Center for Archaeological Research, The University of Texas at San Antonio. Archeological Studies Program, Report 54. Texas Department of Transportation, Environmental Affairs Division, Austin.
- Trierweiler, W. N. (editor)
1996 *Archeological Testing at Fort Hood: 1994–1995*. Archeological Resource Management Series, Research Report No. 35. United States Army, Fort Hood.
- Turner, R. L.
1978 The Tuck Carpenter Site and Its Relations to Other Sites Within the Titus Focus. *Bulletin of the Texas Archeological Society* 49:1–110.
- Turner, S. E., and T. R. Hester
1999 *A Field Guide to Stone Artifacts of Texas Indians*. Gulf Publishing Company, Houston.
- Turner, S. G., and L. Lofgren
1966 Household Size of Prehistoric Western Pueblo Indians. *Southwestern Journal of Anthropology* 22:117–132.
- Van Keuren, Scott
2004 Crafting Feasts in the Prehispanic Southwest. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, edited by B. J. Mills, pp. 192–209. University of Colorado Press, Boulder.
- Watt, Frank H.
1936 A Prehistoric Shelter Burial in Bell County, Texas. *Bulletin of Central Texas Archeological Society* 2:5–27.
1953 Pottery Diffusion of the Central Brazos Valley. *Central Texas Archeologist* 6:57–85.
1956 Archeological Materials from the Asa Warner Sites. *Central Texas Archeologist* 7:6–29.
1965 Notes on the Clark Site, McLennan County, Texas. *Bulletin of the Texas Archeological Society* 36:99–110.

- Watt, Frank H., and W. P. Meroney
 1937 Supplementary Report on Mass Burial Near Waco. *Central Texas Archeologist* 3:27–29.
- Webb, C. H.
 1958 A Review of Northeast Texas Archeology. *Bulletin of the Texas Archeological Society* 29:63–108.
- Webb, C. H., and Monroe Dodd
 1939 Further Excavations at the Gahagan Mound: Connections with a Florida Culture. *Bulletin of the Texas Archeological and Paleontological Society* 11:92–128.
- Webb, C. H., and R. R. McKinney
 1975 Mounds Plantation (16CD12), Caddo Parish, Louisiana. *Louisiana Archaeology* 2:39–128.
- Webb, W. S., and D. L. DeJarnette
 1942 *An Archaeological Survey of Pickwick Basin in the Adjacent Portions of the States of Alabama, Mississippi, and Tennessee*. Bulletin 154. Bureau of American Ethnology, Washington, D.C.
- Weissner, Polly
 1983 Style and Social Information in Kalahari San Projectile Points. *American Antiquity* 48:253–276.
- Wiederhold, J. E.
 2004 Toward a Standardization of Use-Wear Studies: Constructing an Analog for Prehistoric Hidework. M.A. thesis, Department of Anthropology, Texas A&M University, College Station.
- Wobst, M.
 1977 Stylistic Behavior and Information Exchange. In *For the Director: Research Essays in Honor of James B. Griffin*, edited by C. E. Cleland, pp. 317–342. Anthropological Papers No. 61. Museum of Anthropology, University of Michigan, Ann Arbor.
- Wright, Jodi F.
 1997 The Asa Warner Site (41ML46), McLennan County, Texas. *Bulletin of the Texas Archeological Society* 68:215–262.