Caddo Archeology Journal

Volume 32 2022

CADDO ARCHEOLOGY JOURNAL

ISSN 1522-0427

Published by the Caddo Conference Organization, Murfreesboro, Tennessee

Printed in the United States of America by Alexander Printing Co., Delight, Arkansas

CADDO ARCHEOLOGY JOURNAL

Volume 32, 2022

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From the Editor

As we begin 2022, we are still in a pandemic, but hold hope it will be subsiding soon. We have seen changes in many of our institutions with the retirement of colleagues and the passing of friends. We welcome new faces; a new tribal council was elected last year at the Caddo Nation of Oklahoma, and there is a new director at the Arkansas Archeological Survey. The Caddo Archaeology Research Fund offers an exciting new grant opportunity. The Caddo Conference Organization's website has been revamped (http://www.caddoconference.org/). I look forward to visiting with everyone at the Caddo Conference in April.

I am grateful to the peer reviewers who spent time and effort reviewing the manuscripts for the articles in Volume 32. Thank you to Timothy K. Perttula, Current Research editor, who compiled and edited the current research reports and book review. As he and George Sabo are stepping down from the editorial board with this volume, I thank them both for their years of service to the Caddo Conference Organization.

This journal does not exist without submissions from our readers. I look forward to reading about your work and encourage you to submit a manuscript for consideration in the next year's volume!

The *Caddo Archeology Journal*

The *Caddo Archeology Journal* is devoted to the anthropology, history, geography, and current activities of the Caddo Nation, an American Indian group with a historical range covering the four-state area of Texas, Louisiana, Arkansas, and Oklahoma. The *Caddo Archeology Journal* began as the *Caddoan Archeology Newsletter* in 1989 and in 1996 the name changed to simply *Caddoan Archeology*. In 2003 the name of the journal was changed to *Caddoan Archeology Journal*, and in 2006 the name was changed again to *Caddo Archeology Journal*.

Timothy K. Perttula was founder and editor from 1989 until 1993 when Lois Albert became editor. Perttula resumed his editorial role in 2002 until George A. Avery became editor in 2010. Duncan P. McKinnon served as editor from 2016 to 2020. Mary Beth Trubitt began in 2020 as the current journal editor.

The *Caddo Archeology Journal* is published annually in the spring. Members of the Caddo Conference Organization receive a copy of the journal and access to digital copies on the Caddo Conference Organization website (http://www.caddoconference.org/). There are limited numbers of print backissues that can be ordered by contacting the journal editor.

The *Caddo Archeology Journal* publishes:

- Articles directly related to the interpretation and evaluation of Caddo archeology and history that provide relevant consideration of an issue or theoretical position.
- Preliminary, review, and updated regional summaries of anthropological and historical work conducted within the Caddo region or has linkages to Caddo studies.
- Technical and methodological reports that are comprehensible to most readers and provide new insights into evaluating Caddo archeology.
- Book reviews related to Caddo publications on history, geography, ethnography, anthropology, and current activities of Caddo Nation of Oklahoma.

Information for Authors

Articles should not exceed 10,000 words in length, including references. Reports should not exceed 5,000 words including references. The journal follows the Society for American Archaeology's 2021 style guide.

Please submit the following to the editor at mtrubit@uark.edu:

- a PDF file of the complete submission OR a Word file containing the complete paper (including abstract, tables and figures) OR a Word file containing the text, references, table and figure captions, plus an individual file of each figure (600 dpi) and/or table (Excel format preferred for tables).

After submission, article manuscripts will be sent out to a minimum of two reviewers. Reviewer comments are requested within 30 days.

On the Cover: Novaculite bifaces from the Garland County cache, Museum of the Red River collections. See Brooks, this issue.

Decolonizing in Practice: Renaming of an Ancestral Caddo Ceramic Vessel Type

Shawn Lambert,[1] Jeri Redcorn,[2] Chase Earles,[2] and Timothy K. Perttula[3]
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Using an Indigenous archaeological approach, this article reexamines and renames one of the most well-known Caddo ceramic types, Spiro Engraved, as Iwi Engraved. Recent research has concluded that potters did not make Spiro Engraved vessels at the Spiro Mound site (34LF40) or at any other northern Caddo ceremonial center, which calls into question the ceramic type's continued utility in archaeological/anthropological research. Also, the current type name created by mid-twentieth-century archaeologists does not embrace the voices, perspectives, and historical ties of the descendant communities who have meaningful cultural associations with the vessels. This article thus emphasizes the importance of decolonizing archaeological practice through valuing and including the knowledge of Indigenous peoples.

Amongst the most iconic of the ceramic vessel types made by ancestral Caddo potters in the Caddo area is what has been called Spiro Engraved (Figure 1), especially its bottle form with a tall conical neck and spherical body and graceful concentric circles, concentric or nested arcs, spirals, and nested squares repeated usually four times around the vessel body. Spiro Engraved was first recognized by archaeologists in Oklahoma and Texas in the 1940s and early 1950s, and it was formally defined by Suhm and Krieger (1954:358 and Plate 65) and Suhm and Jelks (1962:147 and Plate 74).

Long thought to be an engraved type made and used by communities throughout the Caddo area, including the Arkansas River basin in eastern Oklahoma (referred to as the Northern Caddo area, see Perttula et al. 2021:Figure 1.1), recent archaeological studies of the type by Shawn Lambert (discussed in the next section) has indicated that this is not the case. "Spiro" Engraved is a geographic and cultural misnomer, and this distinctive type warrants a renaming that reflects both its production in the Southern Caddo area and "would reflect Caddo culture or history" (Redcorn 2021:288).

Spiro Engraved Type Description

Spiro Engraved vessels are some of the most well-crafted and diagnostic decorative styles in the Caddo area. Caddo potters built the vessels with very thin walls, fine-grained grog temper (crushed sherds from broken vessels), highly burnished surfaces, and intricate abstract engraved motifs. Engraved motifs consisted of concentric circles, concentric or nested arcs, single and double spirals, and nested squares usually repeated four times around the vessel body (Girard et al. 2014). Caddo potters also added red or white clay pigments into the engraved lines. While it appears that Caddo potters primarily made Spiro Engraved bottles, especially in mortuary contexts, they also made Spiro Engraved bowls, jars, and compound vessels. According to contemporary Caddo potters, only exceptional clay sources would have had the plasticity needed to build such vessels and have them survive the firing process. The clay sources from which their ancestors made Spiro Engraved vessels were incredibly important places on the landscape, and the pots remained tethered to those places even as they were being made and used (Earles 2012, 2015).

Strong social factors of apprenticeship, whereby skilled artisans shared the knowledge of where and how to gather clay to make Spiro Engraved vessels, preserved their continued widespread circulation for at least 200 years. Spiro Engraved vessels have been recovered in many different domestic and ceremonial contexts throughout the Caddo region and at Mississippian period sites to the east, such as Cahokia

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Figure 1. Examples of Spiro Engraved bottles: *a*, T. N. Coles (41RR3); *b*, Crenshaw site (3MI6, Vessel 1371); *c*, Crenshaw site (3MI6, Vessel 1472). Image of Figure 1*a* courtesy of the Texas Archeological Research Laboratory at the University of Texas. Figures 1*b*–1*c* from Perttula et al. (2014).

(11MS2) and in northwest Iowa (Brennan et al. 2019; Green et al. 2020). More work is necessary to determine whether Caddo potters or local imitators made Spiro Engraved pottery from non-Caddo contexts.

The Limitations of the Spiro Engraved Type

The central role of ceramics in archaeological research is that its study provides a significant source of technological, economic, and social insight into present and past cultures across the world (Hegmon 2003). Specifically, archaeologists develop and maintain the use of ceramic typologies to understand diachronic chronologies and track functional, technological, and stylistic continuity and change in past societies (Gifford 1960). While these research analyses are useful, and have been useful for several generations of archaeologists, ceramic types tend to become simply static descriptive and chronological tools to understand the character of cultural groups in time and place.

One of the points often made in the defense of the type-variety system is its practicality for further analysis: i.e., when old collections are reanalyzed or when new sites are documented (Smith 1979). In archaeological research, especially in the Cultural Resource Management industry, the use of previously developed type-variety systems allows one to make quick and easy comparisons of pottery from several sites simultaneously and the system is assumed to be "flexible to accommodate any foreseeable circumstances in future situations" (Gifford 1976:4). Thus, one piece of diagnostic pottery has the power to both identify but also alter the temporal and spatial understanding of an entire site as the corpus of ceramic data continues to grow.

Ceramic types and varieties are typically defined using a number of different attributes, such as variations in decorative methods and elements, surface treatments, paste, and temper (Plog 2008). Then, analyses divide the pottery into distinct groups based on these defined attributes. Assuming continuity within and discontinuity between typological categories, each group is finally given a type-variety name (Chilton 1999). The question is whether different type names are empirical or theoretical units of inference? In other words, have archaeologists objectively developed types that already naturally existed (Willey and Phillips 1958), designed them from the results of gained empirical knowledge (Chilton 1999), or defined them employing paradigmatic

classification of select attributes (Dunnell 1971)?

Archaeologists working in the Caddo area continue primarily to employ the type-variety system (the system being approximately 65+ years old at this point) in their ceramic analyses to distinguish between Early, Middle, and Late Caddo occupations, temporal age ranges, and cultural affiliations (Perttula et al. 2021:5–8). Girard and colleagues (2014:54) noted that "even though separate type names are employed, strong similarities in use of decoration" continued within the Caddo area (and the Arkansas River basin in eastern Oklahoma) during the Early Caddo period. Early Caddo ceramic types, like Spiro Engraved, have been and continue to be used to show "clear stylistic divergences" from Caddo's Woodland ancestors and their Mississippian neighbors to the east (Girard et al. 2014:55). Thus, Spiro Engraved pottery is primarily used as a key cultural, temporal, and geographical trait to define the Early Caddo peoples and their sites across the entire region.

The way that the typing of Spiro Engraved vessels (and all other Caddo ceramic types) is utilized in sites and collections is problematic for two primary reasons. First, in the quest to maintain Spiro Engraved as an empirical and cultural-historical ceramic type, Caddo archaeologists have not tried to understand how the type name "Spiro" has influenced the perceptions of "who, where, and when?" in the archaeological record. Spiro Engraved vessels were produced and distributed, and the moment the Spiro Engraved type was created, it has been assumed the pottery was locally made at the Spiro site since it was found there, as well as at sites in southwest Arkansas and east Texas (Suhm and Jelks 1962:147). This lack of spatial and cultural focus has produced a false sense of cultural homogeneity across what we now know were geographically diverse Caddo communities (Lambert 2021). Thus, until recently, questions concerning Spiro Engraved production locales, its distribution, and use by Caddo and Spiroan peoples have been largely static for more than 50–60 years.

A recent stylistic and provenance study conducted by Lambert (2017, 2021) has shown that Spiro Engraved and other Early Caddo fine ware ceramics were produced in a more centralized area than previously known. Lambert performed instrumental neutron activation analysis on 57 Spiro Engraved sherds (approximately 63% of the total fine ware assemblage) from five Northern Caddo or Arkansas River basin mound centers in eastern Oklahoma to determine whether they were made locally or made and brought from another area. The results showed that none of the Spiro Engraved vessels were locally made at Spiro or any other northern Caddo ceremonial center. In fact, all appear to have been produced hundreds of kilometers to the south, likely along the Red River valley in the Southern Caddo area. Now that we know Spiro Engraved vessels were not produced at Spiro, its name needs to be changed to reflect a more accurate Caddo cultural identifier.

This leads us to the second issue with the current use of Spiro Engraved as a type name. There is an increasing call to decolonize archaeology and work with Native Americans in collaboration, recognition, and preservation of contemporary Native American knowledge and perspectives (Atalay 2006; Oland et al. 2012; Patterson 2010). Decolonizing archaeology aims to value the goals, histories, heritage, hopes, and knowledge of the communities whose material culture archaeologists research (Harris and Wasilewski 2004). While it may be challenging (even impossible for some) to tear down westernized archaeological epistemological barriers, employing Indigenous perspectives allows us to begin to transform the practice of archaeology (Schneider and Hayes 2020). One piece that we can take away from this barrier is transforming how archaeologists have classified, categorized, and named Indigenous material culture. Most ceramic types were named by people of European descent during the mid-to-late twentieth century without any regard to Indigenous perspectives and their connections to the material culture that archaeologists were researching. Thus, most type names we continue to use in our research in the Caddo archaeological area represent a time when colonialism had control over "all aspects of [Indigenous] daily lives, including relationships, beliefs, and social values" (Redcorn 2021:282). The Caddo people have seen a significant surge in the revitalization of traditional and contemporary ceramic and material arts practices as well as other means of communicating social beliefs. For example, Chase Kahwinhut Earles, a master Caddo potter, stated that the ceramic vessels their ancestors made and the contemporary ones he produces are all a

part of his cultural identity (Earles 2021:297–300). In this sense, the type name, Spiro Engraved, should be decolonized and renamed with a Caddo-specific name meaningful to the Caddo people. We believe that type name decolonization is a potent strategy for restoring and preserving Indigenous knowledge with, for, and by the Caddo people.

The Renaming of the Spiro Engraved Type

Caddo artists have come together and decided that the new Caddo name for Spiro Engraved is Iwi Engraved. *Iwi* means eagle in the Caddo language. The Caddo relate the concentric circles and spiral motifs of *Iwi* as indicative of the Birdman figure. Archaeologically, the Birdman is a common motif seen on a variety of marine shell cups and gorgets from Spiro and copper plates from Mississippian period sites (Phillips and Brown 1978:124–130). The Birdman is usually depicted as a human and bird hybrid with outstretched wings, tail feathers, and a hooked nose or beak (Brown 2007). Ethnographic evidence shows that eagles were prominent and powerful figures in Caddo cultural narratives and used in many rituals and ceremonies (Gadus 2013). Avian raptors, like the eagle and hawk and possibly the Birdman, persist in Caddo ceremonies today. One Caddo Ghost Dance is about *Iwi*, and it starts with "*Nah Iwi awwiidah*" ("The Eagle came"); "*Nahah nadakaa*" ("Now he's among us" [translated by Randlett Edmonds, June 7, 1993]). What the Birdman means to the Caddo has sadly been lost over the years. Thus more work is necessary to understand the iconographic and historical connections between Eagle/Birdman and Iwi Engraved decorative motifs.

Summary

Renaming Spiro Engraved to Iwi Engraved is the first step in decolonizing cultural historical typologies in archaeological practice. Cultural objects like Iwi Engraved that archaeologists have incorporated into their research have always played a central role in Caddo oral narratives, especially in contemporary Caddo art. In this view, Iwi Engraved ceramics are no longer outdated descriptive diagnostic tools. Rather, they are transformed into objects that have visible Indigenous histories, stories, and meanings that are attached to an Indigenous community who have meaningful associations with them. Collaboration and incorporating Indigenous ways of knowing with archaeological research is thus a powerful way to understand the past (Mackenthun and Mucher 2021).

This collaborative effort is a critical reexamination of how deep history and material culture is (re)made with perspectives from Indigenous traditional knowledge, histories, and their impact on scientific discourse. This ceramic type re-naming project is also a significant opportunity for collaboration between the Caddo people and the archaeological community to develop better approaches to archaeological practices for long-term care and protection of important cultural objects and sites. Renaming one ceramic type may seem insignificant to some. However, this modification showcases the value of respecting and implementing Tribal cultural beliefs, perspectives, and protocols into archaeological practice, not for the value of archaeological research, but solely for the celebration and preservation of Indigenous archives and material culture knowledge.

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Analysis of a Biface Cache from Garland County, Arkansas, in the Collections of the Museum of the Red River

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Prehistoric artifacts of poorly defined provenance are often thought to have little research value. In this paper I present the results from analysis of a cache of 26 bifaces attributed to Garland County, Arkansas, residing in the collections of the Museum of the Red River in Idabel, Oklahoma. The history of the biface cache is followed as it moves from its initial collection to being donated to the Museum of the Red River in 2004. Comparisons are made with two other biface caches in the region (from the Kelly Creek site, 3GA17, and nearby site 3GA128). Observations on the 26 bifaces are presented focusing on metric and qualitative attributes and interpretations made on some aspects of manufacture. Final discussion points the issues with collections of indeterminate provenances and suggest some avenues for determining the location of the cache.

In 2004, a collection of 26 bifaces was donated to the Museum of the Red River in Idabel, Oklahoma. This cache of bifaces, although described as being from Garland County, Arkansas, between Hot Springs and Malvern, was suspected as possibly being from the Kelly Creek site (3GA17) or nearby site 3GA128. In this paper I examine the history of the Museum of the Red River donation and the background of the Kelly Creek site and associated biface caches. The work then proceeds to an analysis of the biface cache housed at the Museum of the Red River and a comparison to those from the Kelly Creek site and vicinity. My final comments address the likely location of this cache and recommendations for future research.

History of the Museum of the Red River Biface Cache Donation

The cache consists of 26 Arkansas Novaculite bifaces. As noted, the biface collection was donated to the Museum of the Red River in 2004. However, this only represents the end point of the cache's travels and history. The following represents the cache's itinerary (Museum of the Red River n.d.). While no date can be assigned as to when the biface cache was initially found, it was reportedly collected by Gary Kennington of Texarkana, Arkansas. Other than the cache being found between Hot Springs and Malvern, no additional details on the cache context was documented. Mr. Kennington is not a professional archaeologist and the manner in which he acquired the cache is unknown (e.g., who owned the property where it was found and whether he obtained permission to hunt for artifacts on the property). The first sequence in the timeline that can be firmly assigned to the cache occurs in January 1998 when Greg Perino of the Museum of the Red River authenticated the pieces for Cleatious Thomas of Texarkana. Cleatious Thomas was well-known in southwest Arkansas as a notorious digger, collector, and dealer in prehistoric artifacts. It is not known whether Mr. Thomas acquired the biface cache from Gary Kennington or was simply acting on his behalf when he sought authentication from Greg Perino. There is a gap of some six years between Cleatious Thomas bringing the collection to Greg Perino for his opinion and when it was donated to the Museum of the Red River in 2004. The donor likely acquired the biface cache from Cleatious Thomas sometime during this six-year window as there is a history of Mr. Thomas selling artifacts to various collectors in the four-state area. However, there is no published record of the cache among local collections (cf., Bonds 2007).

Roger Coleman, an archaeologist with the Ouachita National Forest, observed the bifaces in a visit to the Museum of the Red River in May 2007. He commented in an e-mail to Director Henry Moy that

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he believed the cache could be from the Kelly Creek site (3GA17). Mr. Coleman added that Dr. Ann Early (Arkansas State Archeologist) had previously seen and documented another biface cache, consisting of some 30 bifaces, and recorded the location in the Arkansas state site files as 3GA128.

Since 2007, the Garland County cache has not been the focus of analysis or new attention. It was brought to my attention during a review of the museum's collections for potential research projects. In regard to the Garland County biface cache, I was interested in two primary topics. First, could it be determined whether the Garland County cache was the biface cache that Ann Early had documented (3GA128)? Second, what could we learn about biface caches from the Garland County material? The cache presented an excellent opportunity to analyze a collection of Novaculite heat-treated bifaces and hopefully obtain some insights into their production.

The Kelly Creek Site[1]

Located near the confluence of Kelly Creek and the Ouachita River, the Kelly Creek site (3GA17) represents one of the earliest recorded archaeological sites for Garland County. It may have been reported as early as 1857 based on notes at the Smithsonian Institution (Williams 1857:367–369). However, it was not until 1963 that amateur archaeologist Forest Sargent of Hot Springs formally recorded the site and Kelly Creek was given a number in the state's trinomial system (3GA17; Arkansas Archeological Survey n.d. a). In 1967 Mr. Sargent dug a test pit at Kelly Creek. It is unclear whether this was conducted at the instigation of Frank Schambach, Arkansas Archeological Survey Station Archeologist at Southern Arkansas University in Magnolia, or if Mr. Sargent conducted the testing on his own initiative. The test pit was 1.5 m square and dug to a depth of roughly 1.2 m where the water table was encountered. Mr. Sargent's work yielded some 400 sherds as well as numerous dart points, arrow points, lithic debris, ground stone objects, and significant quantities of deer bone and mussel shell (Arkansas Archeological Survey n.d. a; Schambach 1970:406). Temporally diagnostic ceramics and projectile points are indicative of occupations at Kelly Creek extending from late Early Archaic/early Middle Archaic through Caddo periods. Schambach (1982:44) suggested a significant occupation was present during what he labeled as the Dutchman's Garden phase (AD 400–700).

Notes in the site form also indicate that Forest Sargent excavated a cache of some 20 Novaculite bifaces found by him after the landowner or tenant (Mr. Payne) told Mr. Sargent that he had recently plowed the field. From the description, the bifaces appear to have been intentionally arranged or stacked in association with a presumed burial. A sketch of seven of the Novaculite bifaces is shown in Figure 1.

In 1982, when serving as the Station Archeologist at Henderson State University, Ann Early was contacted by a local resident who told her he had found a cache of 30 Novaculite bifaces eroding from what could be interpreted as a pit for heating Novaculite. Dr. Early documented the pieces and encouraged donation of the collection. He declined to do so, and the collection may have been later listed on e-Bay. The biface cache was assigned a separate number from the

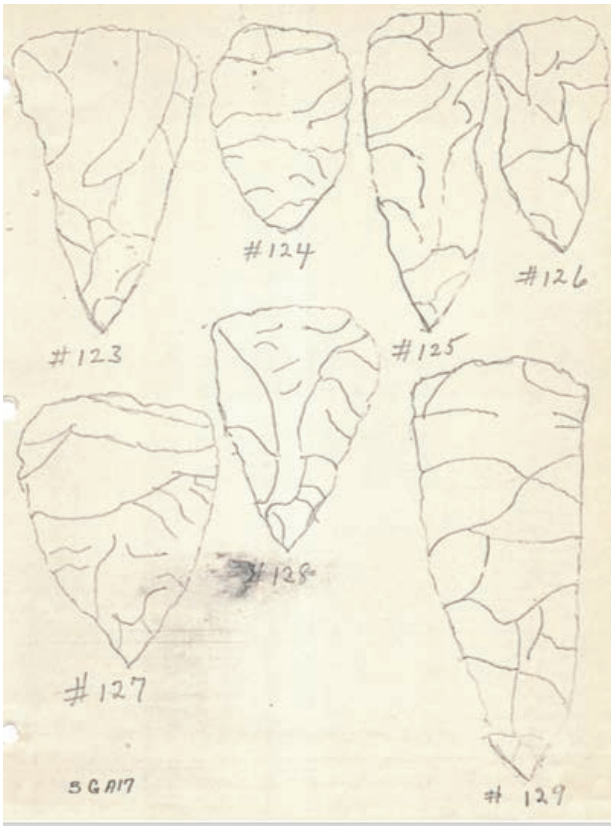

Figure 1. Sketch of seven bifaces from a probable cache at the Kelly Creek site excavated by Forest Sargent in 1967. Image courtesy of the Arkansas Archeological Survey.

Figure 2. Bifaces collected in 1982 by local resident from a suspected Novaculite heating pit at 3GA128. Image courtesy of the Arkansas Archeological Survey.

Kelly Creek site due to some 2 km in spatial separation of the two locales (3GA128; Arkansas Archeological Survey n.d. b). The 30 Novaculite bifaces from this feature are shown in Figure 2. They range in shape with 17 triangular in outline, 10 are roughly ovate, and 3 are more crescent shaped. Examining photographs of the cache documented by Ann Early, around 20 of the bifaces have a pointed termination with the remainder being more bunted/rounded. A final observation from photographs of the bifaces in the 3GA128 cache is that they are gray to dark gray in color.

There are some aspects to the history of archaeology at the Kelly Creek site that are relevant to this paper. First, the site clearly holds (or held) substantial archaeological deposits and was occupied over many millennia (some 5000–6000 years). Among those deposits were at least two large Novaculite biface caches. (There may be additional, unreported ones.) Forest Sargent's collection was donated to the Arkansas Archeological Survey and includes the 20 bifaces

from the presumed burial context. The whereabouts of the 3GA128 cache of 30 bifaces is unknown. Lastly, there have been no professional investigations at the Kelly Creek site. Much of what we know is from a knowledgeable avocational archaeologist (Mr. Sargent) but a more detailed documentation of the site including the range and extent of deposits is lacking.

The Garland County Biface Cache

The Garland County biface cache donated to the Museum of the Red River consists of 26 moderate to large bifaces (Figures 3–6). Twenty-four are white although some have faint red or gray streaking whereas two are more gray in color. They are uniformly of high quality Novaculite with no evidence of fissures or other flaws that would produce knapping difficulties. With one exception, all the bifaces had received some level of heating to improve their knappability (as will be explained in a subsequent section).

The bifaces range in shape from triangular to ovoid with the ovoid shape comprising 65% of the

Figure 3. Bifaces 1–12, Garland County cache, Museum of the Red River collections.

Figure 4. Bifaces 13–24, Garland County cache, Museum of the Red River collections.

Figure 5. Bifaces 25–26, Garland County cache, Museum of the Red River collections.

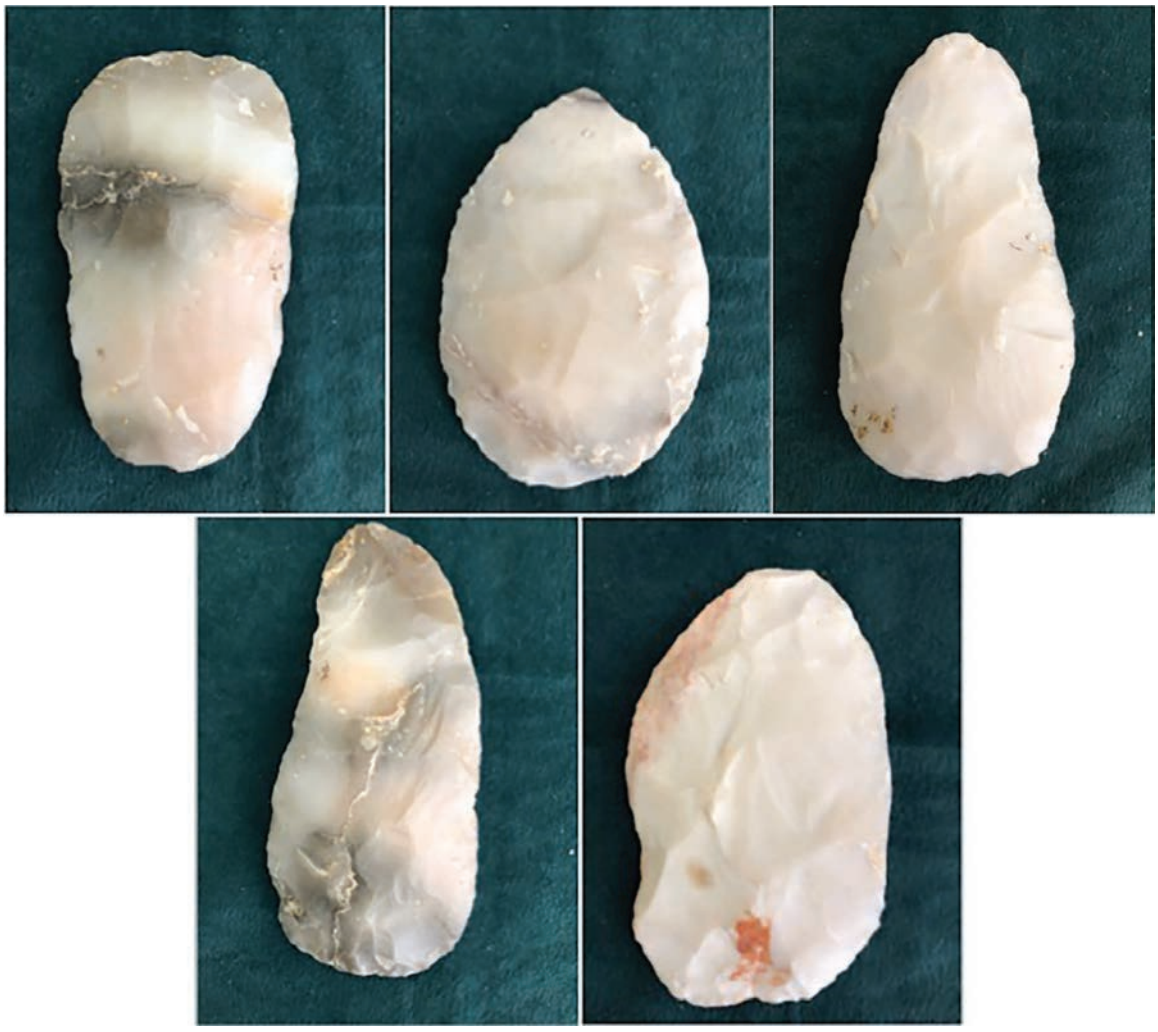

Figure 6. Close-up images of select bifaces from the Garland County cache.

pieces (Figure 7). None of the bifaces had received final trimming and flake scars on the bifaces suggest that they were manufactured using soft hammer percussion, most likely a large antler billet. Based on the curvature of a few pieces, the bifaces may have been initially roughed-out from large flakes struck from bedrock outcrops.

These characteristics are discussed in detail in the following sections.

Analytics

Basic measurements taken consisted of length, width at half the length, width at base, width at termination (if applicable), and thickness. Ratios were subsequently derived from these measurements. Qualitative measures consisted of shape, color, texture, dorsal/ventral orientation, flake scar attributes, and basal and lateral edge characteristics.

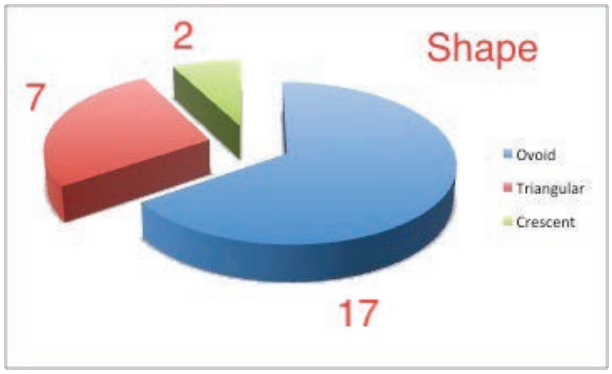

Figure 7. Distribution of Garland County cache bifaces by shape.

Table 1 presents descriptive statistics on basic measurements, while these patterns are graphically presented in Figures 8–11. A couple of points can be made regarding these basic data. The length and the width of the bifaces display little variation from the mean. The mean length is 115.74 mm with a range of 100.36–141.92 mm, and a standard deviation of 10.64. Mean width is 61.21 mm with a range of 45.79–70.67 mm, and a standard deviation of 7.12. This can be seen in Figures 8 and 9 where most values trend to the central value (the mean). This is less true for the thickness and weight where variation from the mean appears to be greater (Figures 10 and 11). Mean thickness is 13.78 mm, the range is 9.70–17.78 mm, and the standard deviation is 1.94. The mean weight is 123.78 g, the range is 89.05–195.80 g, and a standard deviation of 27.78. It may be that the prehistoric knappers were able to better control for the length and width of the biface during manufacture than the thickness. (Thickness to some extent also affects the weight of the specimen.) The thickness of the initial flake struck from the bedrock outcrop also has the potential to affect the thickness of the final product.

Two ratios were also examined in this study. The first was length divided by width. What this ratio yields is a perspective on how streamlined the biface was. For example, a biface that has a ratio of 2.0 is twice as long as wide and would be fairly streamlined. The mean length/width ratio of the Garland County bifaces was 1.89 with a minimum value of 1.38 and a

Table 1. Metrics and qualitative measures, Garland County cache, Museum of the Red River collections.

Specimen	Dorsal Ventral	Distal End	Length	Thickness	Width at Half Length	Proximal Width	Weight
1	Neutral	Bunted	108.64	16.74	58.53	41.69	131.10
2	Dorsal Slightly Convex	Bunted	115.46	15.45	62.47	58.49	136.08
3	Ventral Concave on Distal Half	Bunted	137.01	15.03	55.12	50.47	152.35
4	Ventral concave	Bunted	133.37	13.19	68.18	57.59	152.78
5	Neutral	Bunted	106.51	14.86	49.24	47.77	89.95
6	Neutral	Bunted	116.20	12.92	57.97	35.27	106.50
7	Neutral	Bunted	109.30	14.94	60.36	49.18	122.00
8	Dorsal Convex Ventral Concave	Pointed	112.08	12.35	57.27	44.27	101.50
9	Dorsal Convex Ventral Concave on Distal Half	Pointed	113.09	10.59	45.79	53.61	93.08
10	Neutral	Bunted	115.25	13.27	53.06	53.20	99.40
11	Neutral	Bunted	112.46	12.21	59.32	45.22	100.50
12	Neutral	Pointed	106.20	16.21	61.58	69.74	106.78
13	Neutral	Pointed	121.13	11.68	63.50	58.48	116.70
14	Neutral	Pointed	104.83	14.63	64.69	42.88	198.80
15	Neutral	Bunted	125.58	15.64	62.56	56.66	165.80
16	Ventral Concave	Bunted	122.60	13.49	66.62	63.44	145.40
17	Dorsal Convex	Bunted	141.92	17.78	66.18	58.37	168.68
18	Neutral	Bunted	108.27	13.31	78.67	64.76	136.15
19	Dorsal Convex Ventral Concave	Bunted	122.78	14.79	59.95	64.78	131.88
20	Neutral	Bunted	100.36	11.33	58.34	44.16	89.05
21	Neutral	Pointed	108.02	14.05	70.09	48.58	116.45
22	Neutral	Pointed	121.38	15.01	71.30	52.50	131.10
23	Neutral	Pointed	113.18	11.39	52.35	54.20	98.10
24	Neutral	Pointed	124.75	13.36	57.66	45.26	118.00
25	Neutral	Pointed	107.13	13.99	65.64	55.90	116.05
26	Neutral	Bunted	101.75	9.70	65.09	52.73	94.20

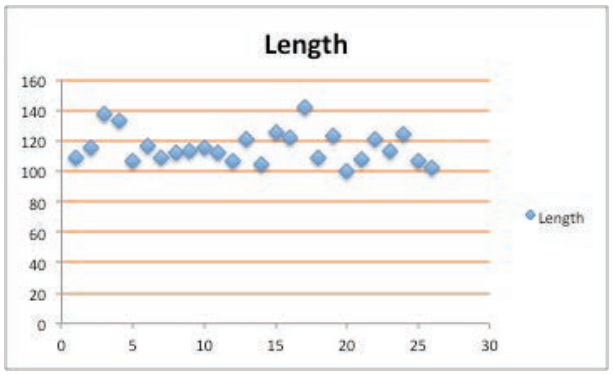

Figure 8. Garland Country cache bifaces, distribution by length.

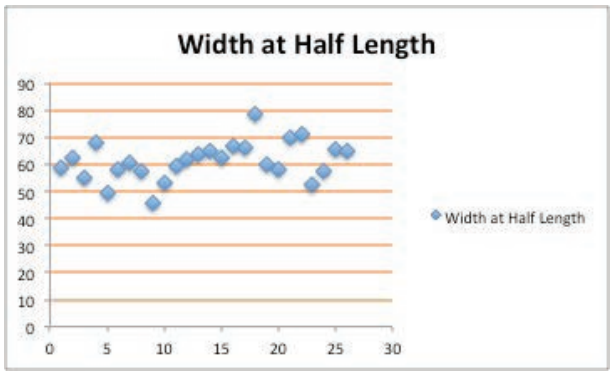

Figure 9. Garland County cache bifaces, distribution by width at half length.

maximum value of 2.49. Thus, the trend is for bifaces that are slightly less than twice as long as they are wide. This results is an ovoid or slightly lenticular shape for most pieces. The second ratio examined was width divided by thickness. This provides some perspective of the cross-section of the artifact. The ideal is probably for a thinner biface which would enhance future tool function. Again, the greater the value, the thinner the specimen. Bifaces from the Garland County cache have a width/thickness ratio mean value of 4.47 with a minimum of 2.49 and a maximum ratio of 6.71. So, the bifaces in the cache are roughly four and a half times as wide as they are thick, resulting in a relatively thin cross-section. This also contributes to a streamlined appearance. The streamlined characteristics reflected in the two ratios may document a mid-point in the manufacture of a projectile point or biface knife. William Andresky (2006) has developed an index for determining the extent of retouch on hafted bifaces. However, those measures were not applied to the Garland County cache. But, there was an absence of final trimming on the lateral edges. They may have been cached in this intermediate phase (lacking final trimming) for future use. Lacking the context of the find, there is no way to determine whether this is the case or not. Even with better context and better metrics, the stage in use-life of the bifaces might not qualified as the finished form of the bifaces might be knives, projectile points, or items of social/ceremonial use.

In some cases, there is a clear linear relationship between various aspects of the shape of the biface. For example, length and width may co-vary with one-another. To examine for linear relationships, simple correlations were examined between length and width, width and thickness, and thickness and weight. These relationships are graphically presented in Figures 12–14. The linear relationships between length and width (.07) and width and thickness (.21) show little covariation.

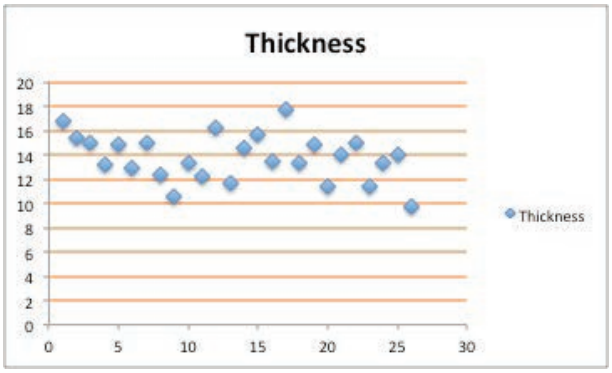

Figure 10. Garland County cache bifaces, distribution by thickness.

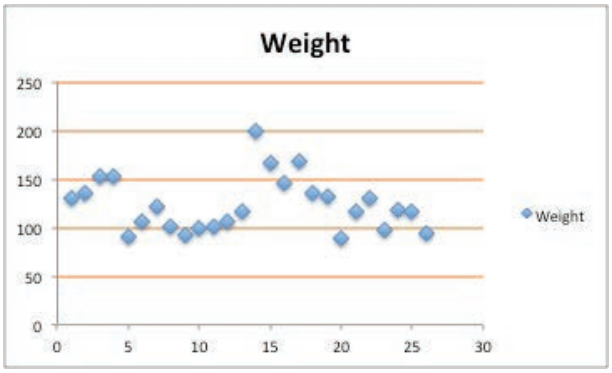

Figure 11. Garland County cache bifaces, distribution by weight.

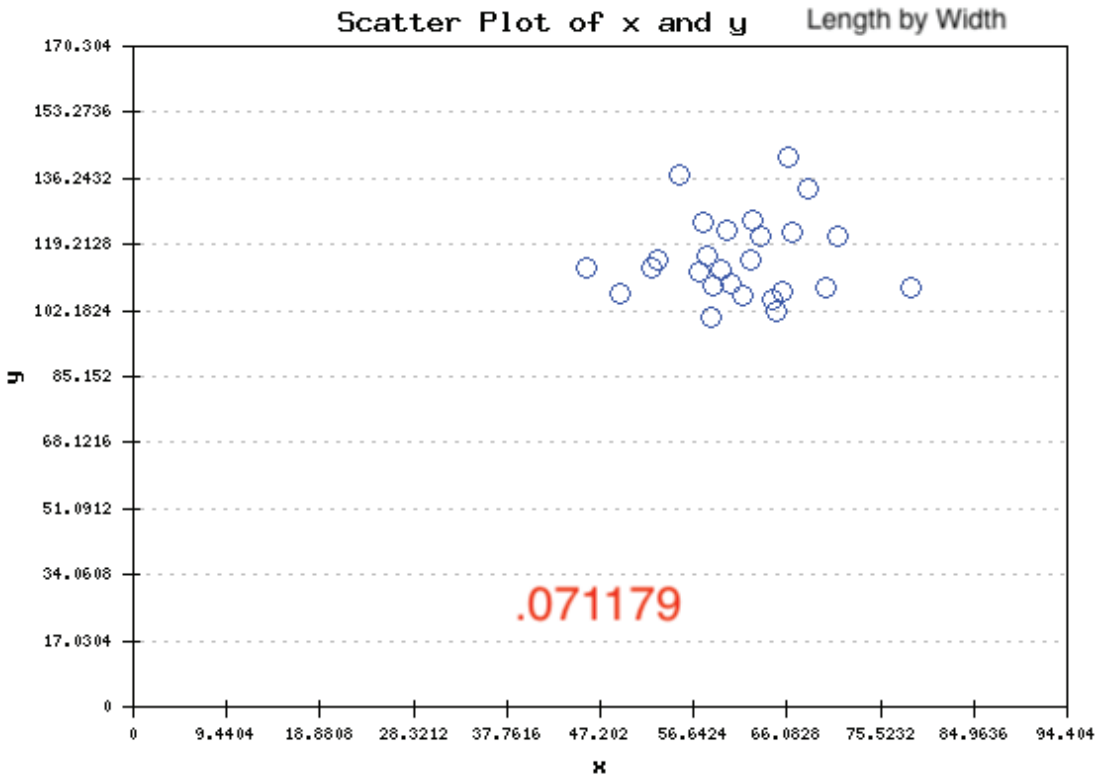

Figure 12. Plot of length by width, Garland County cache bifaces.

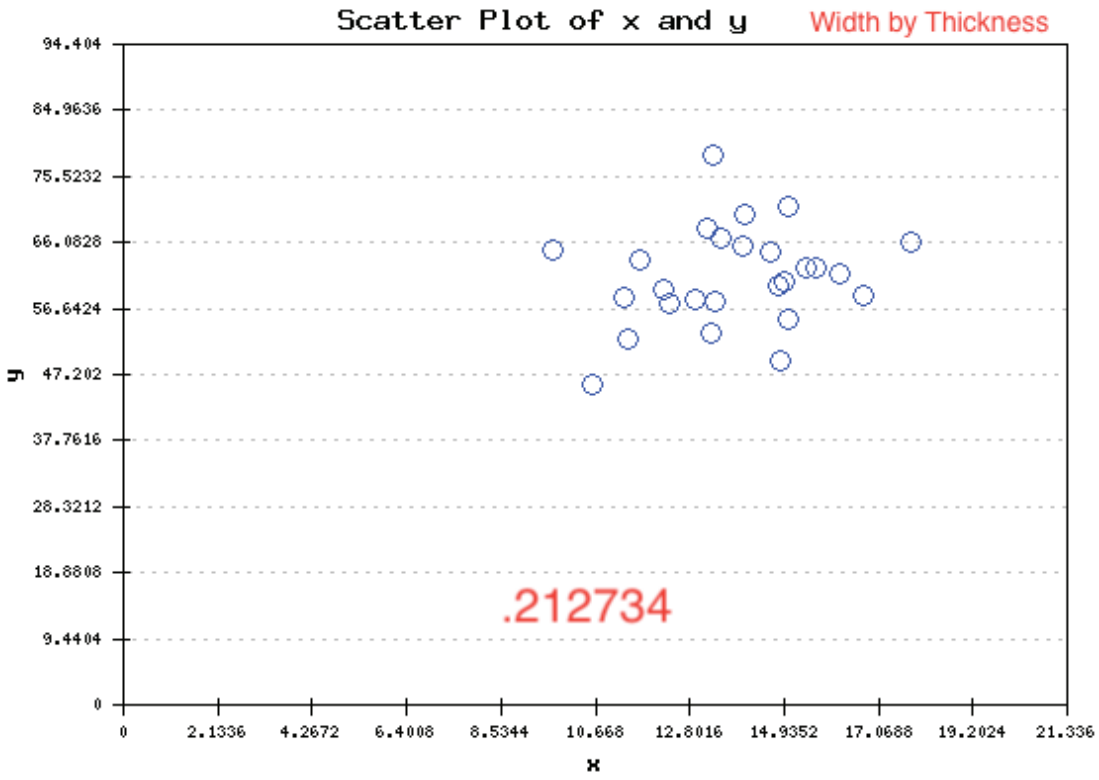

Figure 13. Plot of width by thickness, Garland County cache bifaces.

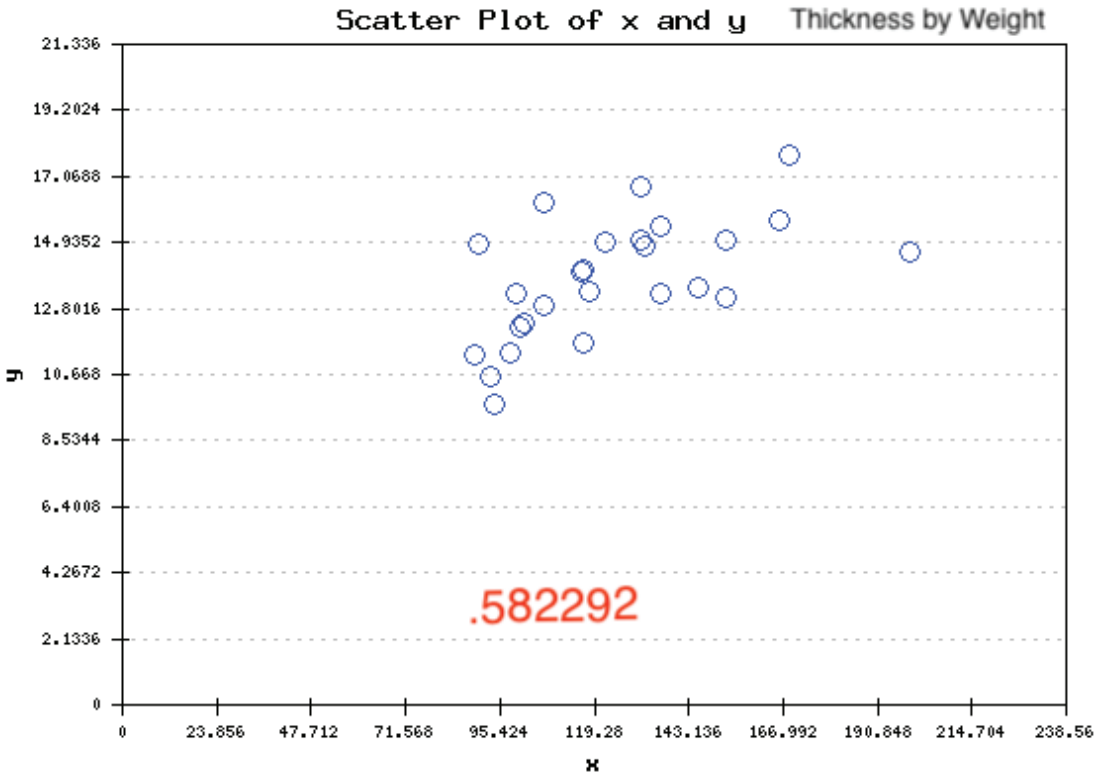

Figure 14. Plot of thickness by weight, Garland County cache bifaces..

However, the relationship between thickness and weight is considerably stronger (.58). This makes a great deal of sense in that a thicker biface will probably weigh more. However, even here, as Figure 14 demonstrates, the relationship is not strongly linear.

Qualitative Measures

There are also some comments that can be made regarding qualitative characteristics of the bifaces, such as their shape, texture, orientation, and manufacture.

As discussed previously, most of the bifaces were ovoid in shape (17), with fewer specimens being either triangular (7), or crescent-shaped (2). Additionally, 19 of the bifaces had bunted/rounded distal terminations with only seven displaying a more pointed termination. The rounded terminations could be further refined to a sharpened tip but this is unlikely as there would be little reason not to prepare them with a pointed tip. I suspect that these bifaces were probably not intended to serve as projectiles.

I also examined the texture of the bifaces. Texture in Novaculite pieces serves as a crude proxy for heating of the stone. There is a caveat as a range of texture in Novaculite occurs naturally. However, it has been recognized that heating of Novaculite brings about noticeable changes in texture, producing a waxy "feel." In the Garland County cache 15 of the bifaces impressionistically have a "waxy" texture, 10 have a "greasy" texture, and one has a "grainy" feel. Admittedly, this is a less controlled measure of thermal alteration of Novaculite compared to that of Flenniken and Garrison (1975:125–131) where they found the physical characteristics of Novaculite only changed after heating that exceeded 450° C. My impression is that the variation in texture relates to the degree of heating or perhaps to the texture of the natural state of the Novaculite before heating. We lack information on the context of the Garland cache. Thus, we do not know whether they were all heated in the same event (such as those in the 3GA128 cache) or were cached after separate heating events. I lean in favor of the bifaces being cached after separate heating events due to their variation. One biface (#19) even has a grainy texture that is common to Novaculite prior to

heating, suggesting either a different sub-source or less treatment.

Another qualitative attribute scrutinized was the dorsal-ventral orientation of the biface. This refers to an examination of the biface in cross-section, looking at the long axis. Eighteen of the bifaces have what I call a neutral perspective. In other words, the biface is roughly proportional on the dorsal and ventral faces. Eight of the bifaces, however, demonstrate some curvature from the ventral to the dorsal face (Figure 15). This curvature gives the biface a somewhat "humpbacked" appearance. This most likely reflects a flake that was struck from the parent outcrop with a resulting curvature that could not be removed during biface production.

The last characteristic I studied was a suite of attributes related to biface manufacture. Included here are the shape and depth of flake scars on bifaces and the preparation of the lateral and basal edges. Flake scars on the dorsal and ventral surfaces of the Garland County cache are broad, shallow, and tend to graduate out rather than terminate in an abrupt step. Studies of biface production (cf., Whittaker 1993) argue that such characteristics are most common in use of a soft hammer such as an antler or fire-hardened wood billets.

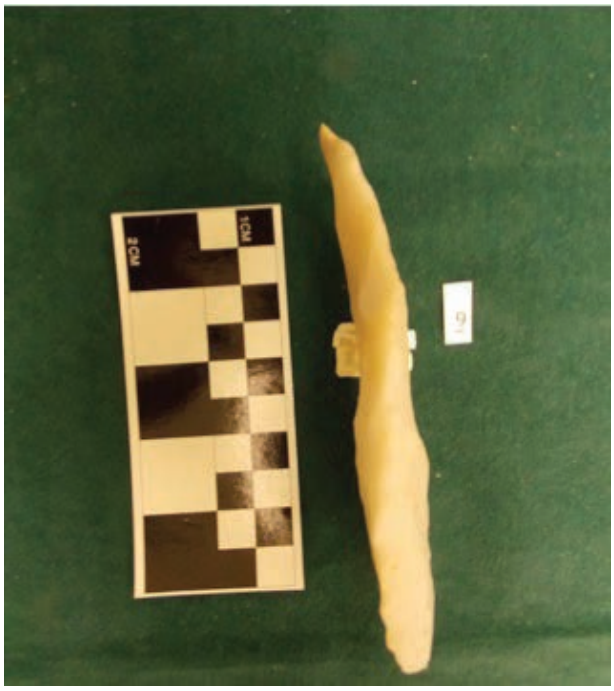

Figure 15. Example of curvature of many of the bifaces from the Garland County cache.

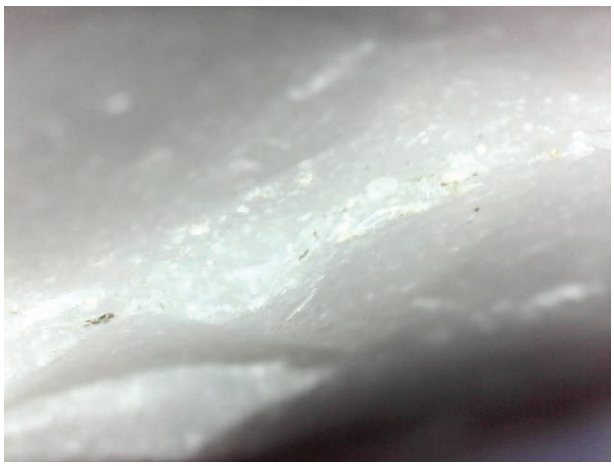

Figure 16. Roughing, grinding, and smoothing present on bifaces from the Garland County cache.

The heating of Novaculite would have greatly facilitated the use of soft hammer percussion. Use of hard (stone) hammer percussion likely would have resulted in more errors in manufacture such as hinge-outs, step-fractures, and lateral breakage. I looked at the lateral and basal edges of select bifaces with digital magnification of approximately 80x. The lateral and basal edges display evidence of smoothing/grinding (Figure 16). This was done with some sort of abrasive stone to set-up striking platforms and gain better contact in flake removal with the soft hammer tool. The examination of the biface edges resulted in one other fascinating clue related to manufacture. Specimen #20 exhibited a striking platform on the distal terminus of the biface (Figure 17). This is probably a left-over from the flake removal from the parent outcrop that had not yet been removed from the biface.

What We Have Learned

Even without information on the context of the Garland County cache, some insights have been gained into its production and curation. The bifaces began as undoubtedly large flakes struck from parent outcrops of high quality Novaculite. They probably were roughed-out as bifaces before heating. It is unlikely that this represents one event. The initial removal, rough-outs, and heating may have entailed a number of separate events. But, they culminated in this group of bifaces receiving further refinement after heating. This was accomplished using soft hammer production. But, the manufacturing process had not been completed as none

Figure 17. Striking platform on the distal termination of Specimen #20, Garland County cache.

of the pieces had received final trimming and their lateral and basal edges have been ground for future flake removals. Based on the concept that the bifaces represent multiple acquisition and heating events and that they had not received final trimming, the Garland County bifaces probably represent a collection that had not been finalized in respect to use.

Discussion

I initially had two research questions concerning the Garland County biface cache. Could we determine whether it was from the Kelly Creek site and what could it tell us about biface caches in general? But, the questions have expanded from these two to include thoughts on cultural affiliation, the cache abandonment question, and its origin.

I am grateful to the Mary Beth Trubitt of the Arkansas Archeological Survey (Henderson State University) for providing color photos of the 3GA128 cache. This was of great help in comparing it to the Garland County material. Is the Garland County biface cache from 3GA128? The 3GA128 cache bifaces are mostly gray to dark gray Novaculite, whereas the Garland County bifaces are primarily white with some red and gray bands. The two caches also differ markedly in shape with the Garland County biface cache containing a greater number of pieces that are ovoid in shape. The cache of bifaces collected from the presumed burial at the Kelly Creek site by Forest Sargent are in the collections of the Arkansas Archeological Survey. Thus, they can be ruled out. But, I suspect that the expansive Kelly Creek site may hold (or held) a number of biface caches. At this time, it can only be demonstrated that the Garland County cache does not represent one of the "known" caches.

The documentation for the Garland County cache states that the bifaces collected by Gary Kennington came from between Hot Springs and Malvern, Arkansas. Examination of the Geologic Map for Arkansas shows Novaculite deposits present along the road from Hot Springs to Malvern (Haley 1993). Field examination of this area might potentially reveal evidence of prehistoric quarry debris and quarry pits in the area. With some reservation it is my belief that Mr. Kennington's location for the biface cache is accurate. Due to the absence of context, I was not initially concerned with the issue of cultural affiliation, especially if it came from the multiple-component Kelly Creek site. Since then, I have considered the problem of age of the cache. Although some exciting new research is being done on aging chipped siliceous stone tools (Younger-Mertz et al. 2016), there is not currently, definitive means of determining the age of the Garland County cache. There has been some research conducted on formal attributes of bifacial preforms to suggest affinity to contracting stem points (cf., Ray 2020). However, few studies have attempted to correlate formal biface preform attributes with time sensitive projectile point styles. This is also an intriguing area of research. Considering the regional context, I would hazard a guess that it dates to either a Woodland or late prehistoric cultural affiliation.

Abandonment refers to the manner in which an item (or items) were placed in what would become their archaeological context (Schiffer 1976). In some instances, items were placed in the ground (buried) with an intent on the part of their owners to recover them later. In other instances, they were placed in the ground with no such intent (such as with a burial). Some

artifacts were unintentionally left behind (lost), while others were discarded for a reason (exhausted as a tool, broken, etc.). Even with better knowledge of the context surrounding the Garland County cache, the reason for abandonment would be difficult to determine (Brooks 2015). Since the bifaces had not received final trimming, they were not abandoned due their being exhausted or reaching the end of their use-life. They also clearly were not broken and discarded. At this point, it appears that the bifaces were placed, most likely in a pit, where they would be re-claimed at a future time. For some reason this did not happen. It could be that the person who left it could not relocate the place. Or he (or she) never returned to re-claim them. The archaeological jargon for this is abandoned without cause.

Concluding Comments

Clearly, one major lesson from this study is context, context, context. It is so important to record information on the exact location, depth, and setting of collections. This would help with cultural affiliation, function of the collection, and maybe the nature of the abandonment. But, I think some things have been learned even with the limited documentation. The question of whether the Garland County biface cache is from the Kelly Creek site or neighboring 3GA128 has been, for the most part resolved; it likely is not. Study of the bifaces has also given us insights on the manufacture of the bifaces from large flakes and that the bifaces had not reached the end of their use-life. There are also directions for further research. For example, the source of the Novaculite for the 26 Garland County bifaces has only been reduced to perhaps an area between Hot Springs and Malvern. In the future, using instrumental neutron activation analysis (INAA), it may be possible to build a signature database for the some 120 Novaculite quarries documented by the Arkansas Archeological Survey (Arkansas Archeological Survey 2016; cf., Scarr 2008). These could then be compared to neutron activation analysis of the Garland County cache to see the degree of correspondence to one or more of the quarry sites. The INAA could also be used to examine the 26 bifaces to determine their degree of correspondence to one another. This might further aid in determining whether they represent multiple events or sources.

There are also means of potentially dating the age of the cache. Thermoluminescence (TL) dating can be applied to stone that has been subjected to fire. It could be used on Garland County biface cache as they had been heated. Another method that shows promise is Fluorine Diffusion Dating (Younger-Mertz et al. 2016). Fluorine is present in most siliceous stone and diffuses over time, thus providing absolute aging of stone where benchmark values have been established. In sum, the study is by no means finished, but perhaps only a beginning.

Acknowledgments

I greatly appreciate the assistance of Director Henry Moy and Keeper of Collections Daniel Vick of the Museum of the Red River in facilitating my study of the Garland County biface cache. Mary Beth Trubitt, Station Archeologist at Henderson State University and Ann Early, Arkansas State Archeologist were very helpful in providing information concerning the Kelly Creek site and the biface cache from 3GA128. Lela Donat, Survey Registrar also aided by providing access to site file data on the Kelly Creek site. The comments of the three reviewers are also appreciated for improving the clarity of the paper.

Note

1. It should be noted that the Kelly Creek site exists on lands now under the management of Entergy-Arkansas and artifact collecting is prohibited. Entergy's power generating at Lake Catherine and Lake Hamilton falls under the jurisdiction of the Federal Energy Regulatory Commission.

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Interview:
Spiro Mounds Archaeological Center: An Interview with Dennis Peterson

Neal McDonald Hampton
Independent Scholar and Caddo Nation Tribal Member

Dennis Peterson is currently manager at the Spiro Mounds Archeological Center in Spiro, Oklahoma. He has managed the Center since 1985. Prior to his current employment, Mr. Peterson worked for the Oklahoma Archaeological Survey in Norman, Oklahoma. He earned a Bachelor of Arts in Anthropology at the University of Oklahoma in 1980. The Oklahoma Historical Society owns the Archaeological Center.

Spiro (34LF40) is the most significant site of Mississippian influence in the Caddo culture area, primarily because of the presence of an elaborate elite city within the geographical area south of the Arkansas River. Furthermore, some researchers have concluded that the descendant tribes of the "Old Peoples" that inhabited Spiro mounds included the Wichita and Affiliated Tribes and the Caddo Nation. The relationship between the old ancestors and descendant peoples may be characterized by a declarative respect and honoring of the old ancestors. Calling the ancestors "old" may be characterized by the Caddo adjective *habiw'kat* (Chafe 2018:262; Girard et al. 2014:17).

In this interview, Peterson mentions the word "Caddoan." Linguists first devised the word in order to organize a set of four Indigenous languages under its rubric. The four tribal languages are Caddo, Wichita, Pawnee, and Arikara. Many language affiliates of related Indigenous nations have been added since the introduction of the word "Caddoan" to the linguistic lexicon (Girard et al. 2014:1). Spiro ceremonial objects and rituals consisted of the height of Caddoan culture in the centuries preceding European contact (Singleton and Reilly 2020:11). Finally, connections between Spiro and surrounding archaeological sites to the Red River settlements may be made on the basis of a shared cosmogony and set of ritually symbolic artifacts (Regnier et al. 2019:310).

My interview with Mr. Peterson reflects an interest in issues of contested ownership, descendant Indigenous nations, and Indigenous forms of writing and communication. Indigenous futures, particularly of descendant peoples of the mound-builders, demand honor and respect to tribal ancestors, their cultures, and their sacred sites of worship. The interview took place on May 11, 2019, at 9:00 a.m., at Spiro Mounds Archaeological Center Lobby, Spiro, Oklahoma.

Hampton: I'd like to ask you, please tell me the background surrounding the purchase of the Spiro Mounds Archaeological Center from the Choctaw Freedmen whose allotments the mounds sit on.

Peterson: Well, the allotment process took place because, after the Civil War, any slaves in the South in the Reconstruction Era were supposed to be given land in property, but the only place where it was enforced was here in Oklahoma, or Indian Territory. At the time, nobody owned land. Effectively, it was an attempt to break up tribal lands. Rather than having parcels scattered all over the place, in the Choctaw Nation especially, the Choctaw Nation, by district, (we're in the northern district called Moshulatubbee) gathered together those folks who qualified for the Freedmen Act. And allocated lands, mostly here in Fort Coffee, that included here at the mound site.

It was mostly the Brown family. At least, for most of our part, they farmed it since the 1870s up until the early 1960s when the Corps of Engineers put in the navigation system along the Arkansas river (which is just directly to the north of us). They purchased the mound site in anticipation of making it into a federal facility. Never happened. Every year they seemed to come up with another plan for another iteration of a

Caddo Archeology Journal Vol. 32, pp. 24–28, 2022. http://www.caddoconference.org

center, but never came up with the funds to do so. In 1970, the state of Oklahoma said, if you won't, we will. 1969 was when the State Archeological Survey was established. Don Wyckoff, Dr. Wyckoff, was pushing for interpretation before removal. We have some 25,000 sites in Oklahoma that we know of at this point in time. Some of them, like the Burnham site, 27 to 33,000 years old. At this point in time, Spiro is the only one you can visit.

In 1970, the state took a long-term lease on the portion of the site that was a part of the Corps of Engineers part of the property and then purchased what remained of the rest of the 150 acres; 138.83 acres is what was purchased by the Corps. It includes the twelve mounds and a portion of the elite site, the elite city. The state purchased an additional ten acres. That is what the buildings are built on. It took until 1977 before the state came up with the funds to create a building on that property. On May 9, 1978, we officially opened as the first, and still the only, prehistoric Native American archaeological site in the state of Oklahoma that you can visit. At that point in time we were a part of the Oklahoma Tourism and Recreation Department. That continued until 1991, and then we were transferred over to the Oklahoma Historical Society at that point.

Hampton: So, it's just OHS. When it first started out, it was state-funded, right?

Peterson: It's still state-funded, just through the Historical Society as opposed to Tourism. Tourism had more money to use for its facilities, but the problem was, unless you a have a lake or a cabin, you can't get much of it. They still saw us as a unique part of Oklahoma's tourism and heritage, but they very seldom put any money into it. The Historical Society sees us as a very intricate part of Oklahoma's history, and we can tell that past, but they're a much smaller agency. That's been the case for the last eleven years. The Historical Society, like most state agencies, had been cut beyond the bone. I used to have a full staff, a couple of full-times, a couple of seasonals, and then summer work programs. Now, it's just me. That's the only way we're able to keep it open. I mean, unless you have some state revenues coming in, but, in terms of keeping the lights on, the bills paid, that all comes from other resources, mostly our admissions now. Those are our sources of funding now.

Hampton: And yet this is so valuable.

Peterson: It's extremely important. I mean, this site is the most powerful group ever to exist in the United States. It is absolutely unique in the Mississippian South, it's absolutely unique in terms of its connections, its art, its writing system. The only writing system, pan-tribal writing system, is here at Spiro, which is the conch shell engravings. So, it gives us insight into a past that, while distant, still has connection to the people today.

Hampton: What is your current relationship with the Caddos and the Wichitas?

Peterson: We try to keep them involved as much as we can. When we first started, we tried to involve them in as many ways as we could. We try, but over the years it tends to be kind of ebb and flow. This is a sacred site for both tribes that have a great affinity for the site, but the tribes themselves really haven't, as a corporate entity, haven't really been very directly involved with the site. They're more involved with the archaeological materials that are stored in museums. We have had a few times, in the 35 years I've been here now, we've had times when elders would come out. We've been very open to the idea of having ceremonies here. Some folks are ambivalent about coming on to the site because it's a ceremonial center from a thousand years ago.

Hampton: What knowledge do you have about the looting that took place in the 1930s?

Peterson: From 1933 to 1935, it was the Pocola Mining Company. They weren't miners. They weren't a company. They were just six guys who got ahold of the lease on the burial mound. They dug, but they also hired their relatives to dig too. So, when they dug into the burial mound, which doesn't have gold or silver, they were initially not interested at all. They were saying that they used some of the bones and thousand-year-old cedars they were finding as firewood during the winter of 1933 and spring of 1934. Until local folks came in to see what they had found, not seeing gold or silver, but thousands and thousands of artifacts strewn along the

mound, saying, "I will give you a nickel for that or a dime for that." I mean, there was so much material that they were digging up. This site is the single-most site of leadership materials to be found in the nation. That one mound. And so, in the thirties, it wasn't illegal. It should have been. It was immoral. It was privately-owned land. It was Choctaw Freedmen allotments. The commercial diggers leased it like they would get a lease for coal-mining or for property. In fact, the lease was written that way, as if it were mineral rights they were digging up. They believed that it would be gold and silver. And so they treated it in that manner.

They paid fifty bucks apiece for six guys. Three hundred dollars for a two-year lease. In 1933, that was a lot of money. And then they figured out, we have to make a lot of money. So, they started digging up the artifacts and selling them. Spiro materials are not only large in number, they are artistically superior to almost anything else. So, once it got out of the local area, collectors heard about it. They started wanting it. They would come out to the site. Buyers, who would resell to big collectors. The commercial diggers kept on buying and selling, buying and selling. Commercial diggers also bought stuff from other archaeological sites that were being dug up in the thirties, and it was perpetual. Some of the buyers made their own artifacts and sold them as coming from Spiro. Most collections have kind of a combination of Spiro materials, real artifacts but not necessarily from Spiro, and then fake artifacts that are purported to be from Spiro. The destruction of the site was horrendous. They did not care.

We're lucky we have some photographs from Robert Bell before he was Dr. Bell. His family in Ohio had an antique store. He was buying antique furniture in Arkansas and heard about the site, came over, and started buying a few of the artifacts he could afford, and then sending them back to Ohio to be sold, Marion, Ohio, where his had father and uncle had a furniture store. That's why a number of items were sent there and made their way into collections nearby. The Ohio State Museum has a fairly large collection of the copper as well as some conch shells because of that. Literally, anywhere in the world, there will be a Spiro collection nearby. That's why people called Spiro the "King Tut of the West" because no one had seen anything like it before, and because, from the commercial digs, it was readily available.

So, places like the Smithsonian have large collections, especially in the American Indian, American History, and Natural History collections. From the Smithsonian to UCLA, the University of Chicago, the University of Texas, all over Oklahoma and Arkansas. Overseas, like the Louvre in Paris, the British Museum in London, a museum in Germany, stuff in the Hermitage in Russia. Yugoslavia, Saudi Arabia, Buenos Aires, Japan, Taiwan. A little museum outside of Jerusalem purportedly has stuff. And it's because of their unique character and availability.

In 1934, Dr. Forrest Clements, he was the head of OU Anthropology at the time, heard about the site from Dr. S. C. Dellinger at the University of Arkansas. Dellinger came out and bought some materials. He also warned people that the site was being destroyed. Oklahoma became one of the first states to pass laws to stop that. It's actually a licensing law. Now this was still privately-owned land. The digging ended in the spring of 1935. Dr. Clements came to the site with a couple of Sheriff's deputies with him. They keep the commercial diggers off the property, but it's the Depression. It's a different mind-set. Dr. Clements goes to a summer teaching appointment in California. Back then, you didn't get paid year-round, you were only paid when you taught. He left. He assumed, because they'd gotten kicked off, that they wouldn't come back on. Well, they did.

They ended up destroying the burial mound, the Craig mound. Up to this point, their digging had been concentrated on the three smaller humps, but because they feared at any moment that they might get kicked off the property. They tunneled into the biggest lobe. It was relatively intact at this point. And then they hit what we call the Central Chamber, the Spirit Chamber from around the mid-thirteenth to the mid-fourteenth century. Ceremonial objects were stored in the temple because they were important items of status as well as positional markers in terms of what position you held such as Deer Dancer, or Red Warrior, or Morning Star. They sent them from this life to the afterlife. That's what a burial mound is. A burial mound is a transitional spot from this life into the afterlife for people of importance. Along with them go the artifacts, or the items that show their status they achieved while they were alive and will continue

to hang onto in the afterlife. For this particular group of materials which were generally not personal items of status but were power items. The University of Arkansas at Fayetteville, the week before last, premiered a three-dimensional environment of that particular location. In fact, they premiered it here.

The commercial diggers hit that, and they broke into it. Then, they started pulling out these incredible materials. Fabrics. Basketry. Copper. Conch shells by the bushel-load. Seed pearls. And conch shell beads. Because it is a temple for moving into the afterlife. They started selling things right and left. Dr. Dellinger heard about it, came to the site, and purchased as much of it as he can. They didn't have much money at the University of Arkansas, but he purchased as much of it as he could. That's why they have such a large collection there. They tried to preserve it before it got away. Finally, the lease expired. Now, the commercial diggers had with the backings of the buyers already pushed a lawsuit through the court system to end the state's ability to shut them down. Now, they were violating it anyway, but they were trying to get this to be null and void. It went through the state's supreme court system. The state supreme court basically says that the state has the right to create this law. However, this isn't state land, and, therefore, it doesn't apply.

The commercial diggers had already signed an additional two-year lease with the landowner, but the Craig land wasn't owned because it was a young couple and their two kids. The young couple died. It was actually being executed by George Evans who was the grandfather. The court said that because this land was not just owned outright by the person who signed the lease, and because they wanted to get the best deal, and because there was more than one interested party, they had to have a lease-bidding process, so that the family would get the best deal.

In the spring of 1936, the commercial diggers and some of the backers at the university were bidding for the lease on the property. It was privately-owned here, so there was no way to preserve it, not in the 1930s. The university said that if we couldn't preserve it, then at least they could let us excavate it so that we wouldn't lose the context and the material. In 1936, after the bidding took place, the state took out a multi-year lease on the property. However, the lease agreement with the landowner, with George Evans, required that it had to be flattened, because it's all farmland. The university wasn't going to leave it anyway. Dr. Clements would have preferred just to leave it alone, but it wasn't going to happen during the Great Depression.

In 1936, the University of Oklahoma, because OU was using WPA labor, didn't have enough cash to match what they needed on a WPA project. They had help from the Oklahoma Historical Society for the lease and the project itself from the University of Tulsa, private donors like Frank Phillips. They helped come up with the financial aspect of it. Starting in 1936 until 1941, not just here but on the rest of the site and also in the city area surrounding us, they conducted continual research. The commercial diggers destroyed about one-third of the mound. Luckily, we have photographs of the site in 1914 before the disturbance.

Millions of artifacts, most of which are at OU, are in curatorship for the Wichita and the Caddo. Because of their assistance in being able to do the research, small collections from that are also at the Oklahoma Historical Society and the Oklahoma History Center, at the University of Tulsa, now that collection is at the Gilcrease Museum, and then at Frank Phillips's museum at Woolaroc. OU has by far the largest curation for the Wichita and the Caddo. The next largest would be the Smithsonian's. After that, the University of Arkansas, in terms of numbers and uniqueness, but the largest display is at the Gilcrease Museum. So, there's always a quandary whenever you deal with any archaeological site, especially one of importance like Spiro, preserving the site, preserving the artifacts, but also being able to expose people to this past. Because Spiro is so different from anywhere else, because the art is so expressive (it has the only pan-tribal writing system in the U.S., pre-historically), Spiro allows us to tell a story that no other culture has access to, so, it's a unique aspect to it.

Hampton: How have the artifacts been preserved here, on-site? What efforts have been made recently to include Caddos and Wichitas?

Peterson: The people here were Caddoan-speakers. They eventually became parts of both the Wichita and the Caddo. The Caddo were mostly in the Ouachita Mountains and south at the time that Spiro was in

existence. The Wichita proper, the single group that we call the Wichita were up north and west of us, but the Kichai who were here in eastern Oklahoma and western Arkansas probably are the closest cultural affiliates. They became absorbed into the Wichita. All over the Arkansas Basin, those folks were directly involved with Spiro historically. Both groups are descendants of Spiro. The question is what was going on when European intrusion occurred. The lack of DNA connection means we can't say "It's Caddo" or "It's Wichita" or "It's neither," because we haven't been able to do the DNA work. We'll be able to go and try to see if there's any genetic connection, but culturally Spiro is Caddoan which is why we involve both of them. In terms of trying to get them in, we keep them involved with all of the research, all of the excavations that take place. We want the tribes to be involved here. We'd love to be able to fund the site.

We're in Choctaw territory. We're part of their tourism. But because this is not Choctaw, we are trying to keep them from being directly involved with the site, in terms of its operations, but they're part of why we were able to stay open last year is because they donated funds for the tourism aspect of it which we haven't gotten from anybody else. I would love to have the tribes more directly involved with the site. I would love for the tribes to have more financial investment in the site. The only thing we can do is preserve the site as best we can, keep it from being destroyed or disturbed by natural events or by human action, and try to interpret it as best we can, based upon the knowledge that we have and based on the amount of funds we have. We couldn't do it on state funding because we had to cut into our operating budget. We didn't have funding. I lost all my staff. Just to keep us open. Because we gave people an opportunity to talk about the past, a part of the past that no other place in the state can do. And not only our past, but the entire nation's past. Really inspiring. It's just so unique. We need to strike a kind of a balance in it, how to interpret it most effectively, including both the tribes and the state, all of them in the process but also to understand how we can interpret this more effectively to the general populace.

Hampton: Closing remarks?

Peterson: I'd love to have more Caddo and Wichita – Caddoans – even the Pawnee and the Arikara; although, they were up there in the north at the time to have more of a connection with Spiro. Because, not only do we need to tell the story more effectively, this is their heritage. If they have never been here to Spiro, especially if they're Oklahoma Caddoans. How do they pull in or have a connection with that past that will pull them into the future? It's the quandary that every culture has to do, know where they come from in order to go into the future intact. We've got folks who want to be involved.

Interviewer Neal McDonald Hampton is an enrolled member of the Caddo Nation. He earned a BA in Native American Studies from U.C. Berkeley in 1994 where he joined the academic organization Phi Beta Kappa. He went on to earn an MA in Philosophy from the University of Oklahoma and an MA in History from the University of Central Oklahoma. He joined Phi Alpha Theta, the honors history association, while attending UCO. He would personally like to acknowledge the contributions of the Hampton family to the furtherance of his education and career.

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Comment:
Where is the Archaeology of the Caddo Area in *The Archaeology of Ancient North America*?

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A major new book on North American archaeology has been published by Cambridge University Press (Pauketat and Sassaman 2020) entitled *The Archaeology of Ancient North America*. The book is impressive in scope and size, weighing in at 733 pages, with several hundred excellent color figures and photos, and is written by two of the current preeminent North American archaeologists: Timothy R. Pauketat (University of Illinois-Urbana-Champaign) and Kenneth E. Sassaman (University of Florida).

As a long-practicing archaeologist whose specialty is the archaeology of the Caddo peoples in southwest Arkansas, northwest Louisiana, eastern Oklahoma, and East Texas, when I opened Pauketat and Sassaman's book to see the extent of the coverage of the archaeology of the Caddo Area, a major post-AD 900 cultural area in North America, I came away disappointed. With few exceptions, their perspectives on Caddo archaeology are heavily based on their view of the Spiro site and what they understand of the archaeology of the Arkansas River basin in eastern Oklahoma (Pauketat and Sassaman 2020:94, 391, 399, 401, 414, 438), with only a few mentions of sites like Crenshaw along the Red River in southwest Arkansas, house patterns at the George C. Davis site in East Texas, linkages between Cahokia and Caddo complexes, and an 1850s drawing of a mound site in Caddo Parish, Louisiana (Pauketat and Sassaman 2020:310, 387–388, 390). They do note that the earliest Caddo cultures in the Trans-Mississippi South or West were between AD 900 and the eleventh century AD (Pauketat and Sassaman 2020:391), but Early Caddo sites are strangely dubbed Early Mississippian in their Table 10.2. They never present any coherent perspectives on Caddo archaeology, which can be traced continuously from at least AD 900 to modern-day Caddos of the nineteenth century. Caddo archaeology is known by its impressive mound building among all Caddo societies, complex religious and political practices, the development of agricultural economies, dispersed settlement systems, no evidence of warfare or fortifications, and the development of sophisticated fine ware and utility ware ceramics. They do comment that unlike at the Spiro site, they see no evidence of a Mesoamerican trading network in the Caddo Area (Pauketat and Sassaman 2020:415).

Pauketat and Sassaman (2020:94) describe Spiro as a "Mississippianized Caddo" community, but they do not linger long on explaining what that means; apparently most Caddo communities are not Mississippianized and Mississippian beliefs and practices did not extend into much if any of the Caddo Area (Pauketat and Sassaman 2020:411). This is an interesting juxtaposition of words in that there is little taxonomic unity by archaeologists in how the Spiro site, and other contemporaneous sites in the Arkansas River basin, are viewed: either as Caddo, as Mississippian, or as some other tradition. Doubt may be certainly cast on one or the other taxonomic identification based on what we know about the archaeology of the Spiro site, the Trans-Mississippi South, and Cahokia.

The Spiro site and surrounding cultural area may be the most taxonomically tangled of any archaeological culture in the region, but Pauketat and Sassaman just further entangle the archaeology in its current taxonomic confusion. For example, these terms have been used when discussing the place of Spiro peoples: Late Precontact (Regnier et al. 2019); Caddoan-Mississippian (Regnier et al. 2020:37;

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Singleton and Reilly 2020:xviii–xix [and Spiro and related sites are included by them in the Mississippian region]; Wilson et al. 2020:Figure 1); Caddoan traditions (Wilson and Sullivan 2017:14); and Caddoan (Boles 2020:78, 84; Dye 2020:224, 237, 240; Henning and Schirmer 2020:139, 157–158; Jeter et al. 2020:190, 202; Livingood et al. 2020:42–43, 45, and 51; Singleton and Reilly 2020:8, 11, 15). There are also the terms Northern Caddoan (Brown et al. 2020:95, 111; Burnette et al. 2020:87; Dye 2020:218, 222–223, 225, 228, 230–231, 234, and 239) and Northern Caddo area (Green et al. 2021; Lambert 2021:159, 163, 172 and Figure 8.1; Livingood et al. 2020:37; Perttula et al. 2021:Figure 1.1). There is also the older Arkansas Valley Tradition label (Livingood et al. 2020:49–53), and now more recently the term Spiroan area (see Hammerstedt and Savage 2021:99, 111, 114). I prefer this term for the area of the Spiro site and related sites in the Arkansas River basin (Figure 1) because it does not conflate Spiroan archaeology with the Caddo archaeological record in the Ouachita Mountains and to the south primarily in the Red River basin. I consider the Spiroan Area and Caddo Area terms to mean they are culturally separate from at least ca. AD 900, if not earlier.

Lastly, the text does not consistently separate what is labeled as Caddo or Caddoan, either archaeologically or linguistically. Archaeologically, the Caddo Archaeological Area concerns the area settled since ca. AD 900, if not earlier, by Caddo speakers such as the Hasinai and Kadohadacho, and has nothing to do with Caddoan speakers. Caddoan archaeology, if such a term is to be used, concerns the archaeological record of only the Wichita, Pawnee, and Arikara. In a linguistic sense, Caddo is one of four families in the Caddoan language family (Chafe 1979): Caddo, Wichita, Pawnee, and Arikara. Pauketat and Sassaman (2020:387, 430, 448) incorrectly mention the Caddo-speaking [sic] Wichita and Pawnee as well as the Caddo-speaking [sic] Wichita, Pawnee, and Arikara, and refer to the Caddo speakers [sic] of the Central Plains when they were referring to the Pawnee and Arikara, not the Caddo of the Trans-Mississippi South.

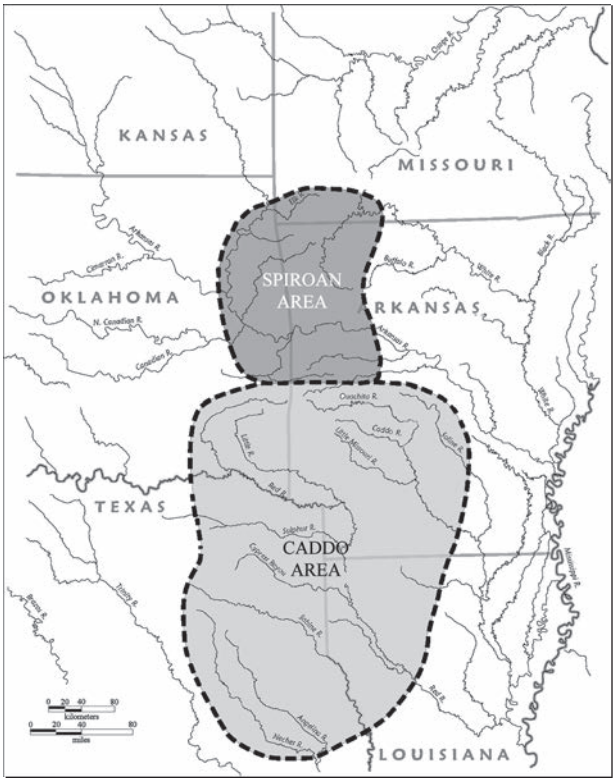

Figure 1. Caddo Area and Spiroan Area in the Trans-Mississippi South. Figure prepared by Lance K. Trask.

Acknowledgments

Thanks to Duncan P. McKinnon, Carl Drexler, and Drew Sitters for reviewing an earlier draft of the manuscript. Lance Trask prepared Figure 1.

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Current Research:
Excavations of the Woodland and Caddo Occupations at the Honey Locust Site (41SM476) in the Sabine River Watershed, Smith County, Texas

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The Honey Locust site (41SM476) provided a unique opportunity to examine multiple Woodland and Caddo features on the same site. Shovel testing, test units, and backhoe trenching found Middle Archaic to Caddo artifacts while a magnetometer survey identified 11 distinct anomalies but no discernible Caddo structures. Block excavations at six of the anomalies found burnt rock clusters alongside a variety of Archaic and Woodland period dart points. Mechanical stripping of the site revealed an additional 17 burned rock features and 13 post/pit and soil stain features scattered across the site along with 13 Middle Caddo period burials in distinct clusters. The burials are thought to date to the Middle Caddo period based on the character of the associated burial vessels (Perttula 2017).

The Honey Locust site is on an upland finger overlooking the convergence of Duck Creek with Hubbard and Stephenson branches (Figure 1) in an area rich with archaeological sites spanning Paleoindian to Historic periods (Haefner et al. 2014; Haefner et al. 2015; Hicks & Company 2017). The site is midway between the Sabine River valley and the river's watershed boundary with the Neches River watershed. Vegetation over most of the site consists of shin-high grasses, scattered bushes, and several honey locust trees in the remains of a terraced pasture. The site itself is one of the many within the surveyed area. Sites 41SM479–41SM481, all discovered during a re-survey component of the data recovery at the Honey Locust site, are all located to the north, on a similar landform rise located across the low flat relief of a broad floodplain (Hicks & Company 2017).

The site was originally discovered by Perennial Environmental Services (PES) as an open campsite extending on the North East Texas Regional Mobility Authority's (NET RMA's) US 69/Toll 49 right-of-way. The size, location, and artifact collection led the Texas Historical Commission (THC) to request additional work at the newly discovered site. The Texas Department of Transportation (TxDOT) Archeology Division of Environmental Affairs required data recovery as the lead agency for the U.S. 69/Toll 49 project. Due to time constraints, and at TxDOT's recommendation, this site was treated as a Post Review Discovery, declaring the portion of the site within the NET RMA ROW as eligible for listing on the National Register of Historic Places and requiring mitigation through staged data recovery. Hicks & Company Environmental Consultants (Hicks) was contracted to do the investigation. Staged work on the Honey Locust site included intensive shovel testing for site delineation, backhoe trenching with geoarcheological investigations, 1x1 m test units, magnetometry survey, block excavations, systematic artifact sampling of a Caddo Area, mechanical scraping, burial exhumations, and a final mechanical scraping of the entire site area to ensure that all cultural features were recorded.

Investigations

Hicks initiated investigations with 67 shovel tests in 2016 to refine the site boundary recorded by PES, and to identify areas with higher artifact concentrations that would provide data to better define the nature and extent of the site's occupations within the project area. Shovel testing found the site boundary is defined to the north

Caddo Archeology Journal Vol. 32, pp. 32–42, 2022. http://www.caddoconference.org

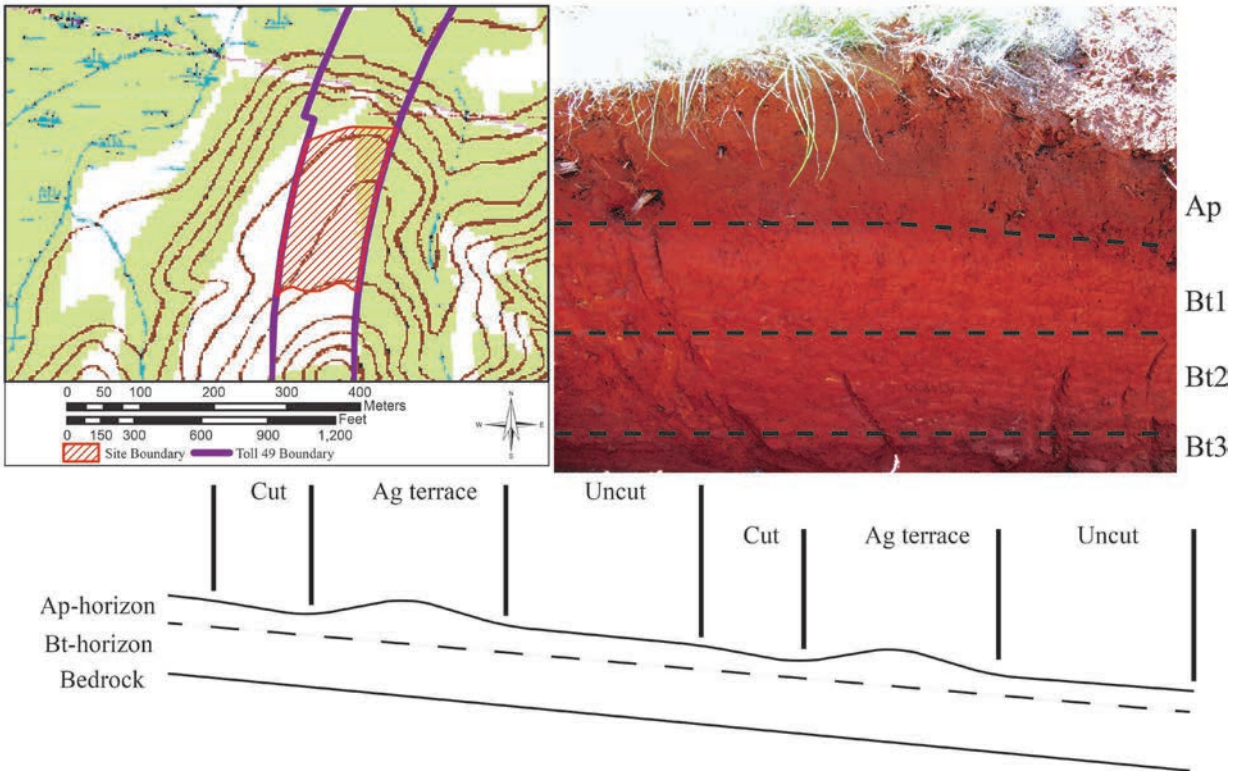


Figure 1. Site topography, soil profile, and site formation processes.

and south by steep slopes and extends past the eastern and western boundaries outside of the Toll 49 corridor. The area of highest artifact concentration is located near the central portion of the Toll 49 corridor and midway between the steep slopes defining the northern and southern boundaries of the site.

Following shovel tests, 15 backhoe trenches were excavated across the site to understand the local geomorphology and soils and to look for intact cultural features. Geologic maps show the landform is Eocene age Queen City Sand with ferruginous ledges and rubble (BEG 1965). Soils are described as Elrose (ErD) (NCSS 2021). Historical maps (see Schoenmann et al. 1917) and aerial imagery suggest the site may have been terraced in the early twentieth century and was a maintained pasture until the late part of the same century. Trenching revealed isolated low agricultural terraces in an Ap-horizon of dark reddish-brown sandy loam 20–50 cm thick with a clear unbroken boundary over a Bt-horizon of clay loam with clay and pebble-size iron-rich sandstone increasing with depth (see Figure 1). No E-horizon was observed in the backhoe trenching. The agricultural terracing affected isolated linear areas of the upper 20 cm of the Ap-horizon leaving the boundary between the A and B-horizons undisturbed beyond normal bioturbidity. As is typical across the region, the shallow A-horizon contains artifacts from multiple occupations at the site. Feature preservation is limited to the top of the B-horizon where bioturbidity is lower (Johnson 1993:69, Figure 5.1). Larger artifacts, e.g., rocks, nutting stones, and other site furniture, become buried through the same bioturbation (Johnson and Watson-Steger 1990:555 and Figure 14).

A total of 44 1x1 m units were excavated across the site area with the majority of these units in the greatest artifact concentration, as determined from shovel testing, in the central portion of the site with a few additional units exploring the site boundaries. Units ranged from 20–70 cm deep with most units between 40 and 50 cm deep. Artifact counts ranged from no artifacts near the boundary of the site to 209 items found in Unit 20 near the center of the site. Test units found two possible post holes (Features 1 and 3), two burned rock features (Features 2 and 4), and Burial 1. Later analysis revealed testing found two pipe fragments in Unit 6 near Burial 1 and a third pipe fragment in Unit 41 near

Burials 3 and 7.

Backhoe trenching and testing found a total of 1688 lithic debitage and 1183 ceramic sherds (1.4:1 lithic/ceramic ratio) with 27 projectile points and fragments. Arrow points (*n*=7) have straight to concave lateral edges creating pronounced to flared shoulders over rectangular stems. Potential types include Alba, Catahoula, Colbert, Scallorn, and Steiner, which are common in the area from the Late Woodland into the Early Caddo period (AD 800–1100) (see Turner et al. 2011). Dart points (*n*=20) have straight edges, prominent to weak shoulders, and a wide variety of stems ranging from contracting on Gary to expanding on Ellis, Godley, and Yarborough as described by Turner and colleagues (2011). Dates for dart points range from the Late Archaic to Woodland period. Gary (*n*=6) is the most common of any dart point type. Perttula (2016:72 and Figure 4) has suggested that the corner notched types Godley and Motley with Dawson and Epps, date from 3000–2500 BP at the end of the Late Archaic and the beginning of the Woodland period, with contracting stem Gary points dating between 2500–2000 BP during the Woodland period. Other lithic tools include eight bifaces, four nutting stones, three cores, and one hammerstone. The collection of 20 dart points indicates occupations from Late Archaic to the Woodland period.

Late prehistoric artifacts include six arrow points, three ceramic pipe fragments, and vessels in Burial 1; they point to a clear Caddo occupation. The variety of projectile points and a lithic/ceramic ratio of 1.4:1 suggests a strong pre-Caddo occupation. However, later ceramic analysis found only one Late Woodland Goose Creek Punctated sherd decorated with small circular punctations (Perttula 2017 and Appendix 2) in Test Unit 36 east of the high artifact concentration.

Walker (2017) conducted a gradiometer survey at 50 cm traverse intervals sampling at 10 readings/sec and GPR data at 60 cm traverse intervals at 64 readings/m to identify magnetic anomalies, e.g., hearths and post hole features potentially outlining Caddo houses. The survey identified 11 dense anomalies less than 2 m in size with no apparent house patterns or other structures.

Identified anomalies were sampled with 1x1 m units in excavation blocks. Excavation Blocks 1–8 revealed rock features in Blocks 3–8 (Figure 2, Table 1). Block 9 explored the area between a small rock cluster and a high artifact concentration found during testing. Block 10 encompasses a 5 m area west and south of Burial 1. No features were found in association with the anomalies in Block 11; therefore, it was abandoned. Blocks 14 and 15 were excavated around burials found during mechanical stripping and were not excavated from the ground surface. Excavations of the rock features focused on mapping, exploring for other features underneath or nearby, and collecting artifacts by 1 m excavation units to look for diagnostic artifacts and trends in artifact counts. Soil samples were collected underneath the features, radiocarbon samples were collected when found, and individual rocks from the larger burned rock features were collected for later archaeomagnetic analysis.

Excavations around rock features revealed either compact or loose distributions of fist-size, local material with no rocks overlapping but resting on the Bt-horizon. Compact features were generally less than 2 m in diameter. Loosely compact features have rocks

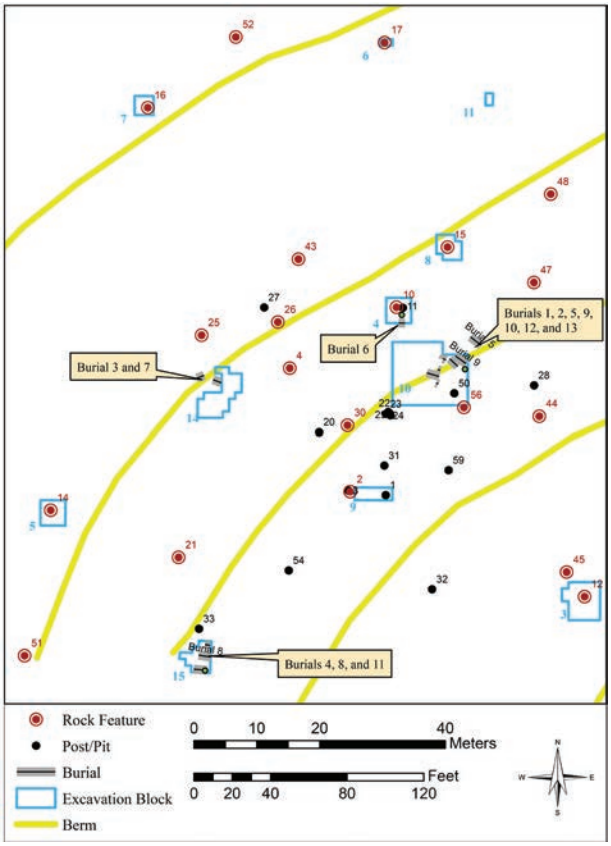


Figure 2. Excavation blocks and features.

distributed over a 4 m area. No evidence of burning, i.e., reddening of the underlying clay or charcoal, was observed after the rocks were removed.

Lithic debitage counts range between 569 and 636 artifacts with 23 to 262 ceramic sherds. No Woodland (sandy paste) ceramics were found in block excavations around rock features. Instead, seven of the Woodland sherds were found in Block 10 closer to the Caddo burials than excavated rock features. Likewise Blocks 4, 8, 9, and 10 are closer to the Caddo burials and have lithic/ceramic ratios between 1.4 and 5.7:1. Block 3, 5–7, and 11 are further from the Caddo burials with lithic/ceramic ratios greater than 10.8:1. Diagnostic projectile points and bifaces were generally found within or adjacent to rock features. Preliminary projectile point analysis shows a collection of Gary and Kent points with tools in 1x1 m units around loosely distributed rocks in Feature 12 in Block 3 versus an Evans-like dart point and three bifaces found near compact rock Feature 10 along with the base of a post (Feature 11) in Block 4 (Figure 3).

Table 1. Block excavation totals.

Block	Square meters	Cubic meters	Mag feature/ anomaly	Feature No. (type)	Projectile points	Lithic debitage	Ceramic sherds	Lithic/ Ceramic
1	1	0.4	5			0	0	
2	2	1.6	4		Dart 1	39	10	3.9
3	22	154	2	12 (rock)	Dart 4, biface 1, scraper 1	596	23	25.9
4	16	118.4	0	10 (rock), 11 (post)	Dart 1	569	262	2.2
5	16	86.4	6	14 (rock)	Biface 1	598	30	19.9
6	2	2	7	17 (rock)	Arrow 3	93	1	93.0
7	9	27	10	6 (rock)		173	16	10.8
8	14	82.6	1	13 (rock)	Dart 1	636	111	5.7
9	10	45		3 (rock)	Dart 6, arrow 1	414	278	1.5
10	169	2132.2		Burials = 7	Dart 57, arrow 22, 4 biface, 3 scraper	8025	5572	1.4
11	2	0.8	13, 14, 15, 16		Dart 2, arrow 1	74	0	
14*	33	422.4		Burials = 2	Dart 5, arrow 3	602	650	0.9
15*	37	185.6		Burials = 3	Dart 9, arrow 2, biface 4	466	120	3.9
				Totals		11217	6303	
*Not excavated from ground surface								

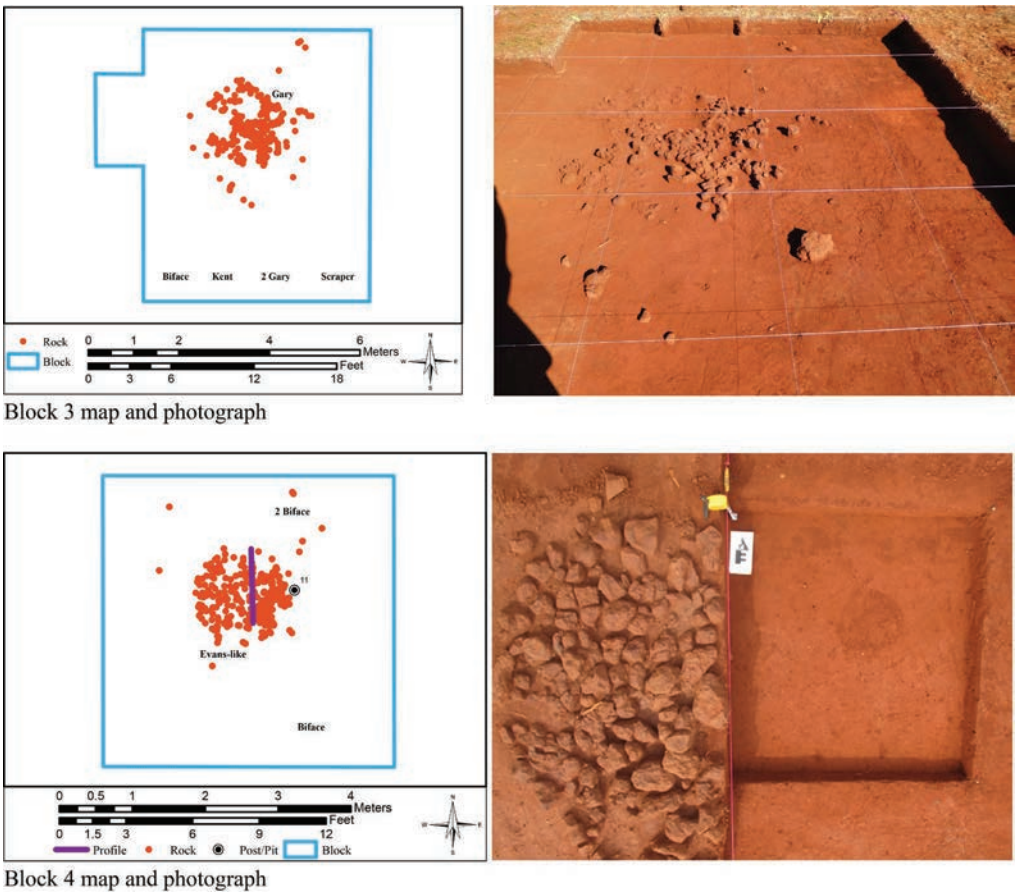


Figure 3. Blocks 3 and 4 photographs and maps.

Mechanical stripping of the site began in a 60 m² area labeled the "Caddo area" determined by TxDOT based on the higher number of ceramic sherds (see Figure 2). The Caddo area was divided into 10 m² (107.6 ft.²) units. Stripping included a Grade-All that exposed the Bt-horizon in the north-south trenches roughly 2 m wide spaced 5 m apart. Mechanical stripping was monitored, potential features were flagged, and the exposed Bt-horizon was troweled at twilight and the following morning to look for cultural features. Documented features were mapped, photographed, and sampled for later analysis. No structure patterns or a midden were observed.

Matrix from individual trenches of the Grade-All within the Caddo area were screened at 2 to 3 m intervals through 1.27 cm (½ inch) mesh wire collecting only ceramic sherds and diagnostic lithic artifacts with the purpose of finding more decorated sherds. Screening within the Caddo area found a large sample of sherds with one plain Woodland sherd roughly 10 m southeast of Block 10. Mechanical stripping continued across the site with the same method of monitoring and documenting features. The removed matrix was not screened. Combined, mechanical stripping was successful in finding 17 additional rock features, 13 post/pit features, two soil stains, and uncovering several of the 13 Middle Caddo burials (see Figure 2).

Seventeen rock features were recorded during mechanical stripping. These features ranged in size from 30 x 40 cm to 220 x 145 cm in diameter. Observed rock features were similar to those of excavated in that they have fist-sized local material in a single layer on top of the Bt-horizon. Combined, a total of 272 lithic debris, 104 sherds, 7 Archaic/Woodland projectile points, and 12 other tools were found in association with these features. Feature 25 contained the only Woodland sherd based on the ceramic analysis by Perttula (2017:Appendix 1).

A total of 13 post and two pit features were recorded as dark soil stains 20 to 30 cm in diameter

and less than 25 cm deep in profile during mechanical stripping. There were no apparent post hole lines or arcs to suggest Caddo structures were present. Noteworthy features included the following.

- Feature 11 was a circular stain 20 cm in diameter exposed during hand excavation in Block 4 adjacent to rock Feature 10 (see Figure 3). This was the only post feature found in close association with a rock feature.
- Feature 29 was a pit 27 cm in diameter and 17 cm deep with mussel shell in the soil matrix. It was recorded in a cluster with shallow post/pit Features 22–24 near the center of the site, roughly 8 m from the nearest rock feature and 12 m to the nearest Caddo burial.
- Feature 31 was 45 x 80 cm in plan and 40 cm deep with an irregular outline. It was also recorded in the center of the site but not in association with the Features 22–24 or 29 cluster or in association with any rock features.

In summary, 25 rock features were recorded; 20 features were plotted on the map as the remaining features were missing feature forms or coordinate data. Seventeen post/pit features were recorded with 15 features plotted on the map as two were missing feature forms or coordinates.

The rock features align with Black and Thoms (2014:210) description of earth ovens on upland settings with a single layer of burned rocks in a circular or oval pattern. Nearby steep slopes along drainages most likely contain "ferruginous ledges and rubble" (BEG 1965) that served as the source of the rock found in features. The lack of a charcoal lens beneath the rocks matches Black and Thoms's (2014:210) prediction of poor organic preservation as a product of bioturbation on upland surfaces. Evidence of reuse/borrowing of rocks for new oven construction is also possible according to Black and Thoms (2014:210); however, none of the mapped rock features are in close proximity with either compact/intact (new) or scattered/scavenged feature (old) to suggest reuse. With rocks that appeared to have been either largely intact or, at least, fractured in place, the provenience of these features is assumed to be representative of their use-location horizontally; displacement vertically is likely as the feature, over time, deflated downward through East Texas sands.

The post/pit features are generally found in the central portion of the site. There is no clear association with either the Middle Caddo burials or the rock features and no discernible patterning that would allow for the identification of individual habitation units or Caddo structures.

Woodland Occupation

The Woodland period (ca. 500 BC–AD 800) in Northeast Texas is described by Ellis (2013:23) as hunter/gatherers with limited horticulture, often staying or re-occupying a single site near a significant plant resource. Features include burned rock concentrations, storage pits, middens, and earth ovens found with artifacts associated with the 1300-year period. Following Black and Thoms (2014), Perttula (2016:76) described Woodland sites within the Sabine River watershed as containing burned rock features from bulk food processing in earth ovens. This period also represents the advent of the bow/arrow with contracting stem dart points, e.g., Gary and Kent, prior to AD 700, followed by expanding stem arrow points, e.g., Friley and Steiner, and the spread of ceramic technology (Shafer and Walters 2010). To the north and east of the Honey Locust site, the Fourche Maline culture is expressed by sites with middens with abundant Williams Plain and other ceramics. To the south, the Goose Creek culture is expressed by sites with few to no midden and Goose Creek Plain ceramics. Sites within the Sabine River and Big Sandy Creek drainages are considered to belong with the Mill Creek culture with few but diverse ceramics (Ellis and Smith 2013: 27 and Figure 6). Perttula (2004:376) describes indigenous ceramic vessels as bowls and flowerpot-shaped jars with thick walls. Black and Story (2003) describe the Mill Creek culture with few sites, few ceramics, and an absence of midden deposits. While an abundance of burned rock features appears to be unique to the Mill Creek cultural area, there are no definitive traits, e.g., ceramic manufacture or decoration, separating Mill Creek sites from Goose Creek sites to the south. Perttula (2013:8) contends the Herman Ballew (41RK222) site is the best example of the Mill Creek culture with three fire cracked rock scatters, seven rock lined hearths/earth ovens, and storage or cooking pits with charcoal remnants. No midden deposits were found. Paleoindian

to Caddo-aged artifacts were found as well, including Gary (67%) dart points and Friley (62%) of the 45 arrow points (Ellis 2013:31), along with a large number of pitted mano and nutting stones.

The rock features at the Honey Locust site are the remains of earth ovens similar to other upland sites with Woodland components in the region. The abundance of earth ovens and projectile points suggest Woodland and earlier occupations frequented the site most likely to process bulk foods harvested from the adjacent wetlands. Diagnostic projectile points across the site included Archaic to Caddo periods. Gary (*n*=59) and Kent (*n*=42) account for 67% of the 151 dart points while Catahoula (*n*=4) and Friley (*n*= 6) account for 23% of the 43 arrow points. Perttula (2017, 2022) describes 10 Woodland period sandy paste Goose Creek Plain, *var. Goose Creek*, Goose Creek Incised, and Goose Creek Punctated sherds on the site suggesting a small/short Late Woodland Mossy Grove (ca. AD 700–900) occupation. Finally, no middens or artifacts connecting the site to the Fourche Maline culture were identified during the excavations.

The Woodland component of the Honey Locust site includes multiple earth ovens from several visits to the location. As described in Johnson (1993) bioturbation moves rocks from the ground surface to the top of the Bt-horizon relatively close to their original position (in a shallow pit?) where they were protected from the creation, terracing, and maintenance of the twentieth-century pasture. Mapping rock features across the Honey Locust site shows more features clustered in the center of the site with fewer near the margins of the investigated area. Likewise, the Woodland collection of sandy paste sherds centers on Block 10 where the ceramic analysis by Perttula (2017, 2022) identified four plain sherds, one sherd with incised parallel lines, and two sherds with incised broad parallel lines; they were found unassociated with any features. As noted earlier, one plain sandy paste sherd was found in Test Unit 36 roughly 20 m east of Block 10, one plain sherd was found screening in the Caddo area roughly 10 m southeast of Block 10, and one plain sandy paste sherd was found in Feature 25 roughly 30 m west of Block 10 during mechanical stripping. Excavations across the site and screening of the Caddo area in the 60 m² area showed that the majority of the rock features are generally outside of the area of most Woodland ceramics in Block 10 (see Figure 2). This suggests the earth ovens were located outside of the habitation areas away from other tasks (Binford 1983; Thoms and Clabaugh 2011) and without the likelihood of injury from the ovens (Clabaugh 2002).

Caddo Occupation

Excavations revealed artifacts from the Caddo occupation at the Honey Locust site are intermixed with the rock features across the site with more sherds found in block excavations within the Caddo area than in those block excavations outside of the Caddo area (Table 1). The Caddo occupation is expressed by the 13 burials and possibly the post/pit features. Burials 1, 2, 9–10, 12 and 13 were found during hand excavation while Burials 3–8, and 11 were found during mechanical stripping and hand excavation within a 5 m block of mechanical stripping. A total of three excavation Blocks (10, 14, and 15) were established around 12 of the burials. One additional interment (Burial 6) was not found in association with any other graves. All 13 burials were individual interments, extended, supine, with heads to the east/southeast within the upper 20 cm of the Bt-horizon.

Combined, the interments contained 32 whole vessels and fragments from an additional four vessels. The 36 ceramic vessels and fragments were analyzed for 16 stylistic and technological attributes (Figures 4–6). Identified vessel shapes were used to make comparisons between groups. Perttula (2017) compared Honey Locust data to known vessel varieties across the region to determine the temporal (in the absence of any radiocarbon dates) and spatial association of the burials. Perttula's (2017) analysis shows burials at Honey Locust are most likely Middle Caddo period (ca. AD 1300–1400) in age with notable differences:

- Fine wares are more common (58%).
- Brushed decorations are more common (50%).
- The absence of pinched, punctated-pitched, and roughened vessels.
- The absence of red slip on the exterior of vessels (one engraved vessel has red pigment rubbed into the decoration) which is more common in the

Neches River basin.

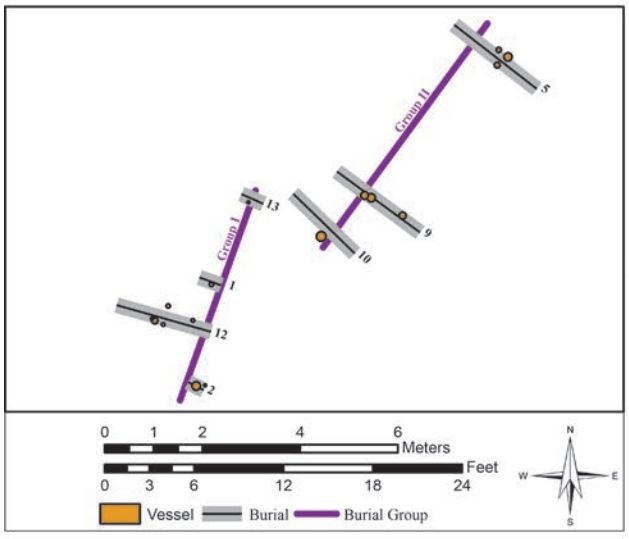
• All the fine wear ceramic vessels are engraved.

Additionally, the analysis identified one shell-tempered vessel from the Red River McCurtain phase (after ca. AD 1300) suggesting trade or travel north of the Sabine River floodplain.

Mapping the burials suggest three Groups (I, II, and III) with parallel, roughly evenly spaced, interments and an additional three graves with no parallel association. Similarities in vessel shape within groups and differences between groups emphasize the associations. Grave depth, length, and orientation were determined by soil staining and vessel alignment.

Group I has four individuals in one row (Burials 1, 2, 12, and 13) in the central portion of Block 10 (see Figure 4). Burials 1, 2, and 12 are evenly spaced 1 m apart while Burial 13 is roughly 1.8 m from the others. The east end of Burial 13 is about 0.6 m from the west end of Burial 10 in Group II. Burials 1, 2, and 13 are roughly 0.4 m in length and have between one and two vessels each; they most likely represent children. The Burial 12 soil stain is 1.5 m in length and contains five vessels suggesting an adult individual. The Nash Neck Banded jar in Burial 12 made with shell temper, and is a ceramic type closely associated with the McCurtain phase (post-AD 1300) along the Red River and north into Oklahoma (Perttula 2017).

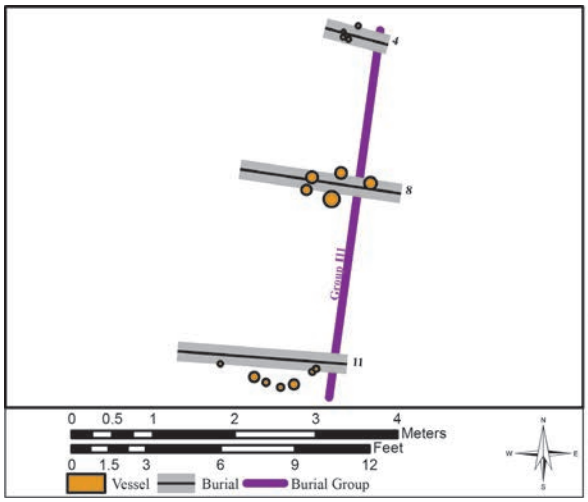
Group II contains three individuals (Burials 5, 9, and 10) northeast of Block 10 (see Figure 4). All three burials have soil stains between 1.5 and 1.75 m in length. Burials 5 and 9 have the same alignment and the same vessel counts (three each) with similar styles and shapes. Burial 10 has only one vessel, is slightly off alignment with the other burials, and is located roughly 0.6 m from the end of Burial 13 in Group I. The vessel shapes are comparable to Group I. However, the number of vessels per adult grave in Group II is between one and three vessels per interment whereas the adult in Group I has five vessels. Vessel shapes have similar ratios.



Index		Group I					
		1	2	12	13	Count	Percent
Bowl	Carranated	Utility		Poyner		2	20%
	Compound					0	0%
	Undefined		Plain	Plain		2	20%
Bottle			Poyner	Fine	Fine	3	30%
Jar				Nash, Utility		2	20%
Unknown					Bullard	1	10%
Total		1	2	5	2	10	100%
Age		Child	Child	Adult	Child		

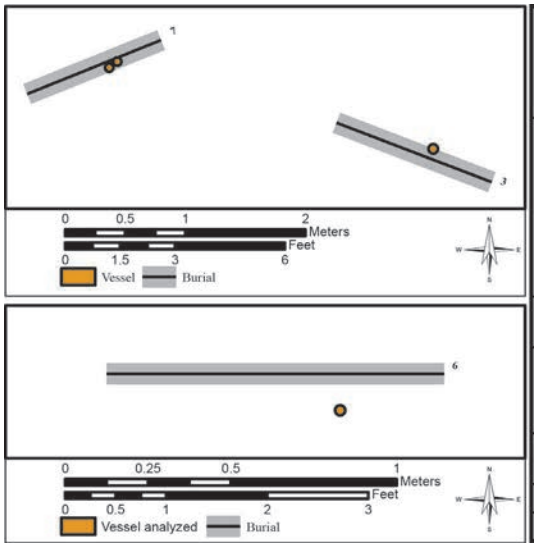
Index		Group II				
		5	9	10	Count	Percent
Bowl	Carranated	Poyner, Fine	Poyner		2	33%
	Compound				0	0%
	Undefined				0	0%
Bottle		Engraved	Fine	Fine	3	50%
Jar			Fine		1	17%
Unknown					0	0%
Total		3	3	1	6	100%
Age		Adult	Adult	Adult		

Figure 4. Groups I and II map and vessel tables.



Index		Separate				
		3	7	6	Count	Percent
Bowl	Carranated	Plain		Plain	2	50%
	Compound				0	0%
	Undefined		Poyner		1	25%
Bottle			Engraved		1	25%
Jar					0	0%
Unknown					0	0%
Total		1	2	1	4	100%
Age		Sub-adult	Sub-adult	Sub-adult		

Figure 5. Group III map and vessel table.



Index		Separate				
		3	7	6	Count	Percent
Bowl	Carranated	Plain		Plain	2	50%
	Compound				0	0%
	Undefined		Poyner		1	25%
Bottle			Engraved		1	25%
Jar					0	0%
Unknown					0	0%
Total		1	2	1	4	100%
Age		Sub-adult	Sub-adult	Sub-adult		

Figure 6. Separate interment maps and vessel table.

Identified vessel decorations are fairly limited within each group. The placement between the groups, similar vessel shapes, and similar decoration types suggest a strong association between Groups I and II.

Group III contains three individuals (Burials 4, 8, and 11) on the extreme southern portion of the site. The burials parallel each other and are evenly spaced 2 m apart (see Figure 5). The burials are between 0.8 m long (Burial 4, child) and roughly 1.5 m long for Burials 8 and 11 (adult). Burial 11 has a Perdiz projectile point under the right side of the cranium. Interments in Group III contain between four and seven vessels each. Group III is unique from the other groups spatially because of its location on the southern portion of the site, its even parallel spacing between interments, and because of the large number and variety of vessels and identified decoration types per grave compared to the other groups.

Separate interments include Burials 3, 6, and 7. Burials 3 and 7 were found during mechanical stripping in the western portion of the site. Block 14

was excavated in the immediate area beginning just above the Bt-horizon; no features were documented. The distance between Burials 3 and 7 and their orientation suggests, they are not grouped like the others. Likewise, Burial 6 was found in the central portion of the site distant from any other Caddo interment. Burials 3 and 7 are roughly 1.2 m in length. Burial 6 is 1 m in length. Burials 3 and 6 each contain one plain carinated bowl while Burial 7 has a Poynor Engraved bowl and an engraved bottle. The similarities in decoration and the number of vessels suggest the individuals were children or sub-adults.

Conclusions

The Honey Locust site (41SM476) has multiple burned rock features associated with Archaic and Woodland period earth oven use to process bulk food items from the adjacent wetlands. These burned rock features represent a departure from the smaller hearths, defined by Black and Thoms (2014:204) as small surface features used for "short-term dry-heat cooking, warmth, and light," typically recorded in Late Woodland/Caddo period sites of Northeast Texas. Instead, they are reminiscent of the bedded heating element associated with earth oven technology more typical of other regions of Texas. Site wide, Gary and Kent projectile points account for 67% of the dart points while Catahoula and Friley account for 23% of the arrow points. These percentages are comparable to those from Herman Ballew (41RK222). However, the Woodland ceramic collection is limited to only 10 sandy paste Goose Creek sherds. None of the mapped rocks features are in close proximity with one compact/intact (newer) and one scattered/scavenged (older) feature to suggest reuse. The excavations show remains of intact earth ovens can be found on upland sites in Northeast Texas. These features are poorly documented in the region's archeological record and undescribed for Smith County and the upper Sabine River drainage area. Earth oven excavation and mapping in the region on other sites may provide more information on the Woodland and earlier use of the environment.

The Caddo occupation includes Formative to Early Caddo arrow points and Middle Caddo burials with a wide distribution of Caddo sherds. Ten of the 13 Middle Caddo burials appear to be placed in three groups based on their relative positions parallel to each other, their being roughly evenly spaced, and with unique assemblages of various vessel types that reinforce the groupings. The presence of a McCurtain phase vessel in a burial and Red River pipe stems shows trade with, or travel to, the area north of the Sabine River floodplain during two different periods of time. There is no obvious association between the burials and the numerous post/pit features. No evidence of Caddo structures or middens were found despite a magnetometer survey, block excavations, and mechanical stripping of the site into the B-horizon.

Acknowledgments

This work was conducted for Hicks & Company Environmental Consultants. At that time, authors' affiliations were Deep East Texas Archaeological Consultants (Galan) and Hicks & Company (Haefner).

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Current Research:
Analytical Findings of the Honey Locust Site (41SM476) Caddo Ceramic Vessel Sherds, Sabine River Basin, Smith County, Texas

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The Honey Locust site (41SM476) in northern Smith County and the Sabine River basin (Figure 1) was excavated by Hicks & Company in 2016 and 2017 in advance of planned development of the North East Texas Regional Mobility Authority's US 69/Toll 49 Segment 4 project right-of-way. The excavations recovered a substantial assemblage of plain and decorated ceramic vessel sherds and four long-stemmed Red River style ceramic pipe sherds from an ancestral Caddo occupation pre-dating ca. AD 1400. There are also a few Woodland period sandy paste Goose Creek Plain, *var. Goose Creek*, Goose Creek Incised, and Goose Creek Punctated sherds, perhaps from a Late Woodland Mossy Grove low intensity use (ca. AD 700–900). The ceramic sherd assemblage I examined includes 1000 decorated sherds from excavated units, blocks, features, and a mechanically-scraped Caddo Locus and 500 plain sherds from excavated units, several blocks, and features.

Utility ware sherds comprise 72.7% of the decorated sherds in the assemblage, and the fine wares (engraved, engraved-lip notched, engraved-excised punctated, and red-slipped) the remaining 27.3%; fine ware sherds are most abundant in the southern block excavations. Key decorative methods and elements on the utility ware and fine ware rim and body sherds indicate that utility wares most commonly have elements characteristic of Maydelle Incised jars with diagonal lines, cross-hatched lines, diagonal opposed lines, and horizontal-diagonal lines (Figure 2*c*–*d*), and diagonal incised lines on the rim and a row of tool punctations at the rim-body juncture (Figure 2*f*). Brushed, brushed-incised, and brushed-punctated sherds are a common body treatment, and the rarity of brushed rims suggests that these sherds are also from Maydelle Incised vessels

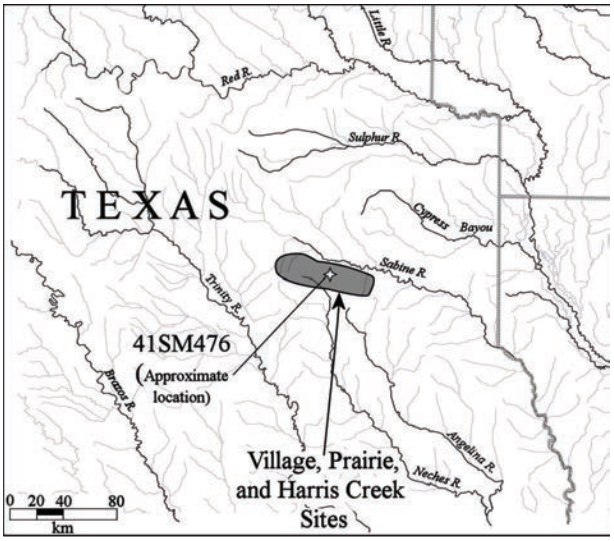

Figure 1. The location of the Honey Locust site (41SM476) in East Texas and the distribution of Middle Caddo period site ceramic vessel sherd and vessel assemblages in northern Smith County, Texas. Figure prepared by Lance K. Trask.

(Figure 2*a*–*b*), an unidentified utility ware, or Bullard Brushed jars. Rim and body sherds with incised panels or triangular incised zones filled with tool punctations are probably also examples of Maydelle Incised (Figure 2*e*), but an incised-punctated rim sherd with a curvilinear incised zone has not been identified to a ca. post-AD 1300 defined type. Rows of fingernail and tool punctated rows on sherds are well represented on rim and body sherds (Figure 2*g*–*h*), but they have not been identified to a utility ware type. An uncommon utility ware are a few sherds from Killough Pinched vessels.

Decorative elements on engraved rim sherds in the Honey Locust site fine wares feature combinations of horizontal, diagonal, and vertical engraved lines, open or hatched triangle and circle elements, narrow

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Figure 2. Key decorative elements on utility ware sherds from the Honey Locust site: *a,* parallel brushed; *b*, horizontal brushed with overlying diagonal incised lines; *c*, cross-hatched incised lines; *d*, diagonal opposed incised lines; *e*, incised triangle element filled with tool punctations; *f*, diagonal incised lines and tool punctated row at rim-body junction; *g*, fingernail punctated rows; *h*, triangle-shaped tool punctated rim. Photograph taken by Brian Wootan.

diagonal hatched zones, and curvilinear zones and lines (Figure 3*b, d*). These are common Middle Caddo fine ware elements in East Texas ceramic assemblages. The triangle elements—hatched or open—are a distinctive element on both Sanders Engraved and Spoonbill Engraved types identified in a number of upper and mid-Sabine River basin ceramic assemblages. The absence of zones, panels, or columns filled with cross-hatched lines is a notable feature in the rims and body sherds of the Honey Locust fine wares.

Engraved body sherds show much the same pattern, especially in the numbers of sherds with hatched zones and triangle elements. Body sherds are also represented by closely-spaced curvilinear engraved lines, as well as curvilinear engraved lines that sometimes end in hooked arms or curvilinear hatched lines (see Figure 3*c, f*), and these are mostly from the bodies of bottles. Rims and body sherds tend to have horizontal lines at the top and bottom of rim panels of carinated bowls. Fine ware sherds with engraved circle elements and excised punctations (see Figure 3*g*) are represented only in the body sherds from the site; these have tentatively been identified as Poynor Engraved, *var. Lang*, a fourteenth-century fine ware in the Upper Neches River basin (Perttula 2011); perhaps these are sherds from imported vessels. One of the 15 fine ware vessels in the Honey Locust cemetery has been compared favorably to a Poynor Engraved, *var. Lang* carinated bowl (Perttula 2020:Table 5). The red-slipped sherds in the Honey Locust assemblage are unique to the body sherds in the main excavation areas. These represent almost 20% of the primary fine ware body sherds. That no engraved sherds have been recovered that also have a red-slipped surface suggest these sherds are from vessels decorated only with a red slip; they have been identified as Sanders Slipped sherds (see Perttula et al. 2016).

The assemblage from the Honey Locust site is dominated by utility ware jars and fine ware carinated bowls and bottles; plain wares are from jars, bowls, and

Figure 3. Key decorative elements on fine ware sherds from the Honey Locust site: *a*, horizontal-diagonal engraved; *b*, curvilinear engraved lines; *c*, curvilinear engraved lines and hooked arm element; *d*, horizontal and curvilinear engraved lines; *e*, oval engraved element; *f*, engraved bracket element; *g*, engraved-punctated element (Poynor Engraved, *var. Lang*). Photograph taken by Brian Wootan.

carinated bowls; orifice diameters could be determined on only a very few sherds, and these seem to indicate that vessels had small to only medium-sized volumes. These vessels are made with silty clay or clay pastes tempered with grog, either as the sole temper or in combination with crushed pieces of hematite and some burned bone inclusions; the low use of bone temper is generally consistent with other upper and mid-Sabine River Middle Caddo period sites, although there are localized exceptions, and the significant use of bone is noted only downstream from the Honey Locust site, in present day Harrison and Rusk counties. The practice of firing vessels was done in an open fire and mainly in a reducing or low oxygen environment; the vessels were commonly pulled from the fire to cool in the open air, leaving lens of oxidized paste on one or both vessel surfaces a lighter color (brown, tan, and orange) than the darker cores. This is a common East Texas Caddo firing practice (Perttula 2013). The frequency of smoothed or burnished surfaces on the vessel sherds is low, primarily because of the poor preservation of sherd surfaces, but utility ware sherds tend to have smoothed interior surfaces, bowls and carinated bowls have smoothed or burnished interior and exterior sherd surfaces, while bottles are smoothed or burnished on sherd exterior surfaces.

Lastly, the use of a red hematite-rich clay pigment was used to decorate the engraved lines on some of the fine ware vessels, most notably carinated bowls and bottles; one engraved vessel with a red pigment was recovered from a burial feature in the cemetery (Perttula 2020). These sherds are from vessels believed to symbolize life and its sacredness to the Caddo peoples who lived at the Honey Locust site.

Other than ceramic vessel sherds, the remainder of the studied ceramic assemblage from the Honey Locust site includes ceramic pipe sherds, a spindle whorl, and a shaped ceramic disk fragment. The pipe sherds are from grog-tempered long-stemmed Red River pipes, including one Haley variety long-stemmed pipe,

that were made between ca. AD 1200–1400. Only after ca. AD 1400 were ceramic elbow pipes made by East Texas Caddo peoples, and this pipe form is not present in the Honey Locust assemblage.

The occurrence of Red River style pipes, the moderate proportions of brushed wares in the tempered ancestral Caddo ceramic assemblage (33.1%, including sherds with brushed-incised, brushed-incised-punctated, and brushed-punctated elements), and the variety of distinctive engraved motifs and red-slipped fine ware sherds, all indicate that the ceramics from the Honey Locust are from a Middle Caddo period component that is estimated to date from ca. AD 1300–1400. Radiocarbon-dated northern Smith County Caddo sites in the Sabine River basin support this temporal assessment, particularly the radiocarbon dates and ceramic sherds from the Redwine (41SM193, Walters and Haskins 1998) and Bryan Hardy (41SM55, Walters and Haskins 2000) sites, as do the vessels from the ancestral Caddo burial features from the Honey Locust site (Perttula 2020) and other upper and mid-Sabine River cemetery sites (see Figure 1).

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Current Research:
Architecture within a Caddo Mound in Hot Spring County, Arkansas

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At the Arkansas Archeological Survey (ARAS) we have begun a new research program of archaeogeophysical surveying and mapping at 3HS22 where a large two or three-stage "temple mound" was recorded in 1967. Pottery attributed to this place suggests its use at least to the Mid-Ouachita and Social Hill phases, ca. AD 1350–1600. When the mound was partially leveled in 1976, Ann Early, then the ARAS research station archaeologist at Henderson State University (HSU), observed a series of construction stages and burned structures in both its higher and lower levels. We have now radiocarbon dated two of these structures. Our preliminary gradiometry survey results from 2021 fieldwork at the site shows anomalies we interpret as structures and other features within or below the mound remnant.

The earthen mounds constructed in Arkansas and other locations across eastern North America in the past are considered to be important historical places and significant cultural landmarks for Native people. Some mounds were used as cemeteries (as was also the case with 3HS22) and should be treated with caution and respect. We started this archaeological project by obtaining permissions from the landowning family and from the chairman and the tribal historic preservation officer of the Caddo Nation of Oklahoma. The Caddo people are the living descendants of the people who built this and other mounds in Hot Spring County during the last millennium.

The National Register of Historic Places (NRHP) records numerous standing buildings as significant locations to our shared history, but few mounds are so designated. The impact of this is that the history of Indigenous societies may be ignored or devalued. At present, 3HS22 has not been nominated to the NRHP, but it should be considered eligible. Earthen mounds across Arkansas are monuments that stand as testament to the long and enduring Native presence here. Yet many have been destroyed in the past. In 2014, Preserve Arkansas highlighted mounds across the state as a category of "Arkansas's Most Endangered Places" (Historic Preservation Alliance of Arkansas 2021). In the case of 3HS22, we credit the farming family that now owns this land with the preservation of the mound and environs that was once home to a thriving Caddo community.

Varying Functions of Mounds

The earliest mound in Arkansas was constructed about 3500 years ago (Early 2020), and mound building continued until about 400 years ago. During these different eras, mounds had varying forms and purposes, and they were created and maintained by distinct Native societies, each with its own cultural tradition. Mounds were built as part of community rituals, as territorial or astronomical markers, for burials of important people, and as platforms for significant buildings or housing for the leadership. Over the last century, looters have dug into mounds, desecrating graves to get pots and other grave goods, destroying mounds in the process. Farmers have bulldozed mounds to level fields for agriculture, and mounds have eroded and washed into rivers during floods. Archaeological excavation can also be destructive, so professional archaeologists balance research interests with preservation and obey federal and state burial protection legislation. Nowadays, archaeologists focus on minimally-invasive techniques to document mounds that are not otherwise threatened.

Many of the mounds that remain are architectural mounds that incorporated buildings,

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often burned and covered with earth. There are several examples of these from the Caddo area in southwest Arkansas. In 1939, prior to the inundation of Lake Ouachita, a Works Progress Administration crew cut a trench through the main mound at Adair (3GA1), revealing a series of at least nine building floors in profile (Starr 2017; Trubitt 2015). In 1972, Frank Schambach (1972, 1996) led an ARAS and Arkansas Archeological Society (AAS) team in salvage excavations at the Ferguson site (3HE63) in Hempstead County. They documented a series of burned buildings on the upper and lower platforms of Mound A before it was leveled. Here, each burned structure was collapsed in and "buried" with a layer of sand before another structure was built on top. Similarly, Cynthia Weber (1971, 1973) from the ARAS-HSU Research Station led excavations at Hays (3CL6) after it was partially leveled, documenting circular structures that she argued were used for ritual and for residence on upper and lower stages of the mound. Superimposed circular and rectangular buildings were exposed in another Clark County mound (3CL593) after burned structural debris was uncovered by bulldozing in 2006 (Reynolds 2007; Trubitt 2009).

These examples of architectural mounds were documented as salvage operations as the ancient earthen constructions were being leveled for farming or development. If the mound is not threatened, we want to investigate it using modern archaeological technology that gives us a view with minimal disturbance to the site and its architecture.

Remote Sensing on Caddo Mounds

Jami Lockhart, who heads the ARAS Computer Services Program in Fayetteville, has used a suite of archaeogeophysical techniques to survey sites across the state, including Caddo mounds in southwest Arkansas. During his dissertation research at the Tom Jones site (3HE40), he showed how multiple techniques could be successfully employed to detect variation in soil moisture, texture, compaction, and magnetism, revealing ancient architectural features (Lockhart 2007, 2010). Gradiometry can be used over large areas to measure differences in soil magnetism, revealing not only historic metal but also thermoremanence indicating burned buildings and burned soil. Resistivity surveying can be used to detect differences in soil moisture, typically indicating past disturbances or compaction. Ground-penetrating radar can be used to detect changes in soil compaction and other elements of the prehistoric built environment within earthen mounds, indicating earlier stages or surfaces and construction features. Electromagnetic conductivity and magnetic susceptibility surveys detect cultural alterations and anthropogenic soil enrichment. By using multiple techniques over the same area, Lockhart showed how ancient cultural features—such as burned structures and hearths—can display different and identifiable patterns. In several cases, the "anomalies" that he identified in the archaeogeophysical surveying were "ground-truthed" by excavations, corroborating their identifications as cultural constructions. The ARAS's remote sensing capabilities have become so successful that few ARAS/AAS Training Program excavations are done without initial remote sensing work (Lockhart 2016).

These techniques can be applied to large areas to both document archaeological sites and allow land managers to better preserve them. Duncan McKinnon's (2017) survey of a large portion of the Battle Mound site (3LA1) resulted in a picture of this important Caddo community, including near-mound architecture and borrow pits and more distant habitation areas and cemeteries. While he summarized the results of previous excavations, he did no additional archaeological excavations at the site. Using archaeogeophysical surveying, he showed the layout of the Battle community beyond the mound, set in the cultural landscape of its neighborhood and outlying region.

The 3HS22 Project

When recorded in 1967, 3HS22 was described as a large mound about 20 feet (6 m) high and 150 yards (137 m) long, covered in trees and brush in a cultivated field. There was a brief mention of the mound (described as 90 m long, 40 m wide, irregular in shape but higher on the east end) even earlier by Harvard University archaeologist Philip Phillips during his Ouachita River valley survey in 1939. Several pieces of pottery attributed to the site in the collections of Judge Harry Lemley and Dr. Thomas Hodges are

now at the Gilcrease Museum in Tulsa and at HSU in Arkadelphia. The ARAS-HSU Research Station has photographs of pottery vessels that were exposed by flooding in 1968 several hundred meters north of the mound. In the early 1970s, several local men looted cemeteries around the mound but one also gave notes and a sketch map to ARAS-HSU that show the mound as having three platforms or stages. Based on the styles of the pottery said to have come from 3HS22 (including archaeological types such as Friendship Engraved, Military Road Incised, Garland Engraved, Means Engraved, Cook Engraved, Foster Trailed-Incised, Keno Trailed, and Hodges Engraved), we estimate that its main use was during the Mid-Ouachita and Social Hill phases (ca. AD 1350–1600; Early and Trubitt 2021).

In March 1976, Ann Early (then the ARAS-HSU Research Station archeologist) recorded her observations as the farmer bulldozed the upper portion of the mound, removing an estimated 10–15 feet (3–4.6 m) and spreading it around the edges. Based on her description, the mound had a series of structures on both its higher eastern and lower western ends. She observed the destruction of two graves in the upper stratum on the east side (human remains of three individuals were later donated to ARAS-HSU, transferred to Fayetteville for Native American Graves Protection and Repatriation Act documentation, published in the Federal Register, and have been repatriated to the Caddo Nation). Early was able to collect fragments of burned logs from two superimposed structures near the center of the mound.

With a small grant from ARAS Hester Davis Fund, we have submitted two charred wood samples from those mound structures to Beta Analytic, Inc., for radiocarbon dating using the accelerator mass spectrometry (AMS) technique. The results are presented in Table 1. Beta Analytic, Inc. provided measured radiocarbon ages, the isotopic ratios, and the conventional radiocarbon ages (corrected using δ13C). Calibrating the conventional radiocarbon ages using CALIB Rev8.2 (Stuiver et al. 2021) results in an age range of cal. AD 1294–1397 at the 2-sigma (95.4%) confidence level for the sample from the lower structure (Acc. 1976-663-4). At the 2-sigma level, the sample from the upper structure (Acc. 1976-663-3) has two age ranges of cal. AD 1320–1359 and AD 1389–1434, with the higher probability of the actual date of tree cutting for the structure timber falling in that later range. These results make sense in terms of the stratigraphic position described for the two structures, that is, the lower structure has an older age. The calibrated dates fall at the beginning of the Mid-Ouachita phase. Since the only samples collected and dated were charred wood from long-lived trees rather than seeds from annual plants, these dates could be older than the structures themselves.

In 1990 and 1992, archaeologists from the Arkansas Highway and Transportation Department (now ArDOT), surveyed and tested an area near the mound in advance of road construction (AMASDA Project 1010). Their work included mechanical stripping of several

Table 1. Radiocarbon (AMS) dating results from 3HS22.

Sample/Context	Measured / Conventional Radiocarbon Age	IRMS δ13C	% area enclosed	Calibrated AD age ranges	Relative area under probability distribution	Median probability cal AD
Beta-606048, Acc. 1976-663-3, charred log fragment from upper structure	measured: 560 +/- 30 BP **conventional: 550 +/- 30 BP**	-25.9 o/oo	68.3 (1 sigma)	1327 - 1338 1395 - 1422	0.214 0.786	1398
			95.4 (2 sigma)	1320 - 1359 1389 - 1434	0.389 0.611	
Beta-606049, Acc. 1976-663-4, charred log fragment from lower structure	measured: 650 +/- 30 BP **conventional: 630 +/- 30 BP**	-26.2 o/oo	68.3 (1 sigma)	1300 - 1324 1354 - 1371 1377 - 1393	0.440 0.279 0.281	1349
			95.4 (2 sigma)	1294 - 1397	1.000	

Note: Radiocarbon dates were analyzed by Beta Analytic, Inc., and conventional radiocarbon ages were calibrated using intcal20.14c, CALIB Rev8.2 (Stuiver et al. 2021).

shallow trenches along the proposed realignment to see if there were cultural features that would be impacted by the construction. West of the mound, the team found a posthole or post mold and a cluster of pottery sherds and novaculite flakes below the plow-disturbed zone, and extended the 3HS22 site boundaries. About 300 m away, they defined a new site (3HS406) based on pits and postholes or post molds with artifacts. In his report, John Miller (1993) interpreted it as a small habitation site or farmstead dating to the East to Mid-Ouachita phase (AD 1100–1500).

Prior to our 2021 project, we had a picture of the two- or three-stage mound with burned structures within it and burials and cemetery areas in/adjacent to it, and several nearby locations with residential features and debris that may be roughly contemporaneous. With the potential for intact architectural residues in and below the mound remnant despite previous bulldozing, and areas beyond the mound that might have cultural features despite past floods and decades of farming, we began a program of archaeogeophysical surveying to document the mound and its surrounding cultural landscape without disturbing subsurface deposits.

We started with electronic total station mapping and precision GPS readings using a Trimble R2 GNSS receiver to keep accurate location during subsequent surveys. We initially set out an 80 x 200 m block (1.6 hectares or about 4 acres), staking corners of each 20 x 20 m square within it. In the process, we were able to create a new topographic map (or, more properly, a hypsographic map showing relative elevations). The truncated mound is now about 50 x 80 m and about 2 m tall with the highest point on the west end (Figure 1).

Over two days in June and July 2021, Lockhart led the gradiometry survey, walking transects back and forth across each of the 40 20 x 20 m grid squares. In October, we extended the area of gradiometry coverage to the southeast of the mound, covering an elevated area with another 20 20 x 20m grids (Figure 2).

The data were collected using a Bartington 601-2 set for 0.01 nanotesla sensitivity, and a resolution composed of 50 cm traverses with measurements taken

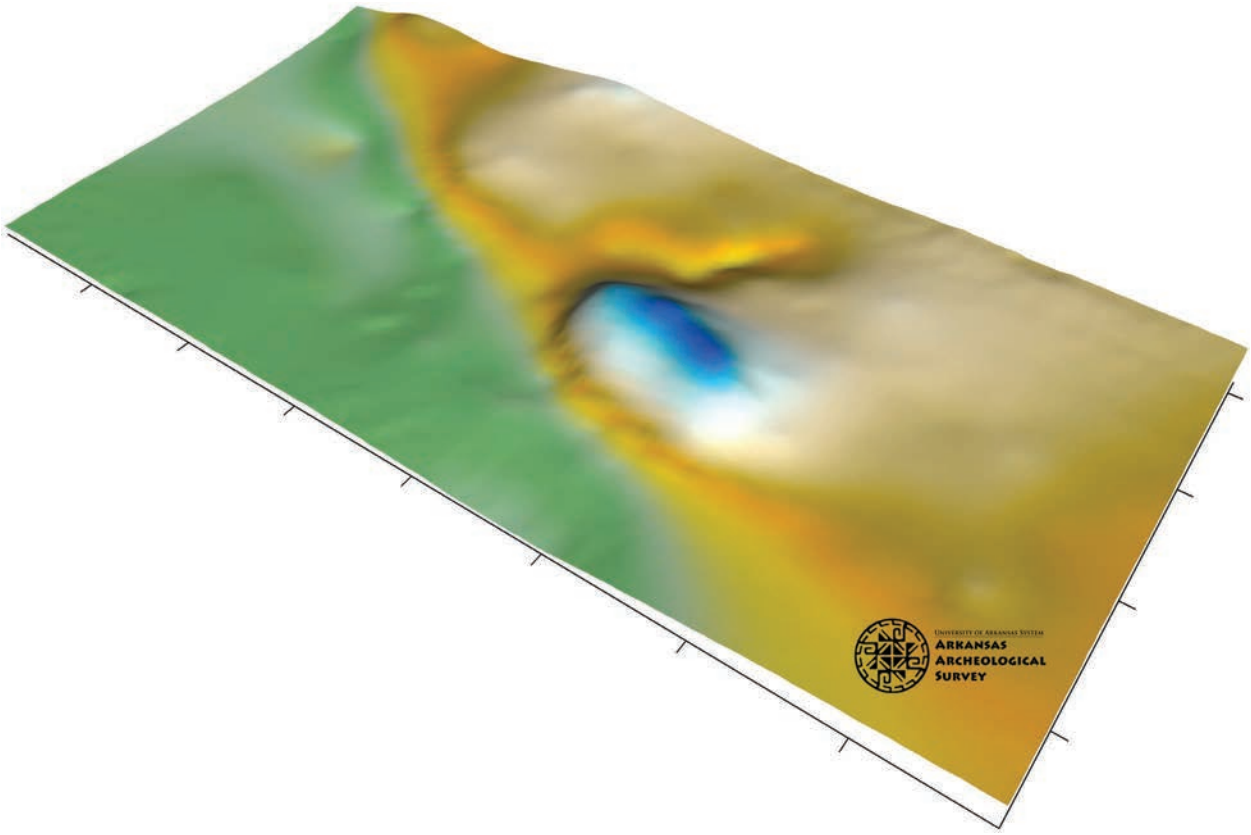

Figure 1. Three-dimensional view of 3HS22 to the southeast (tick marks are at 50 m intervals).

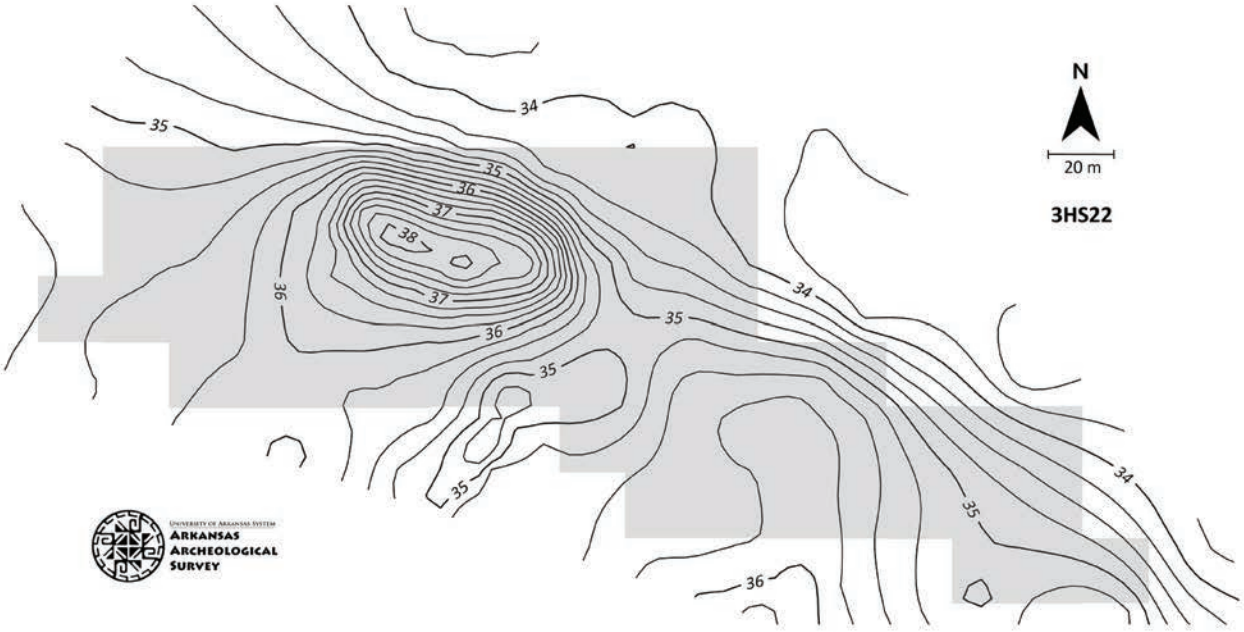

Figure 2. Map of 3HS22 showing area of 2021 gradiometry survey coverage (60 20 x 20 m grids). Note that elevation is shown as height above ellipsoid in meters; the study area has elevations ranging between 60 and 65 m above mean sea level.

every 12.5 cm along each traverse. In processing, the data were assembled (mosaic-ed), de-striped to remove heading errors, de-staggered for better alignment between traverses, and interpolated to 12.5 cm x/y resolution. The data were then georeferenced to the UTM NAD83 geographic coordinate system within GIS software, which allows the data to be clipped to accentuate anomalies for visualization, or alternatively determine the actual magnitude of each original measurement as it was collected in the field. Figure 3 shows the hypsography or relative elevation for the study area, derived from USGS lidar, and Figures 4 and 5 show the gradiometry with probable metal dipoles identified along with select interpretations.

Our initial interpretations must concede massive mechanized disturbance; Lockhart has identified and taken into account dipoles indicating metal. The red dots in Figure 4 indicate larger metal dipoles.

The processed data indicate both curvilinear and rectilinear thermoremanent patterning (Kvamme 2006). We interpret at least 12 to 15 differentially burned structures with circular or ovate patterning predominating on the mound. The most apparent of these distinctly regular circular anomalies occur along the mound's apex. If the perimeters of these anomalies represent walls (we have not yet ruled out circular activity areas), these structures would have been large—as much as 12 to 15 m in diameter—and they appear to have been constructed with central hearths. We highlight some of the anomalies in Figure 5. The data indicate some superpositioning of anomalies, indicating the potential for successive episodes. In the future, we may be able to use ground penetrating radar to clarify this. GPR has the capability to differentiate features by depth and has been used to identify buried surfaces within mounds.

Not all interpreted structures display this large size or perfectly circular pattern. There is an ovate grouping of structures that trends southward from the apex of the mound. This grouping (indicated by the red arrows and magenta oval in Figure 5) is on elevated topography that may indicate a conjoined earthen platform with structures facing inward toward a common plaza or activity area. This likely plaza area has indications of anthropogenic magnetic enrichment. The structures vary in size from 6 to 10 m, and perhaps larger. There is also one particularly well formed structure-like anomaly south of the apex and east of the ovate grouping (yellow arrow in Figure 5). Using

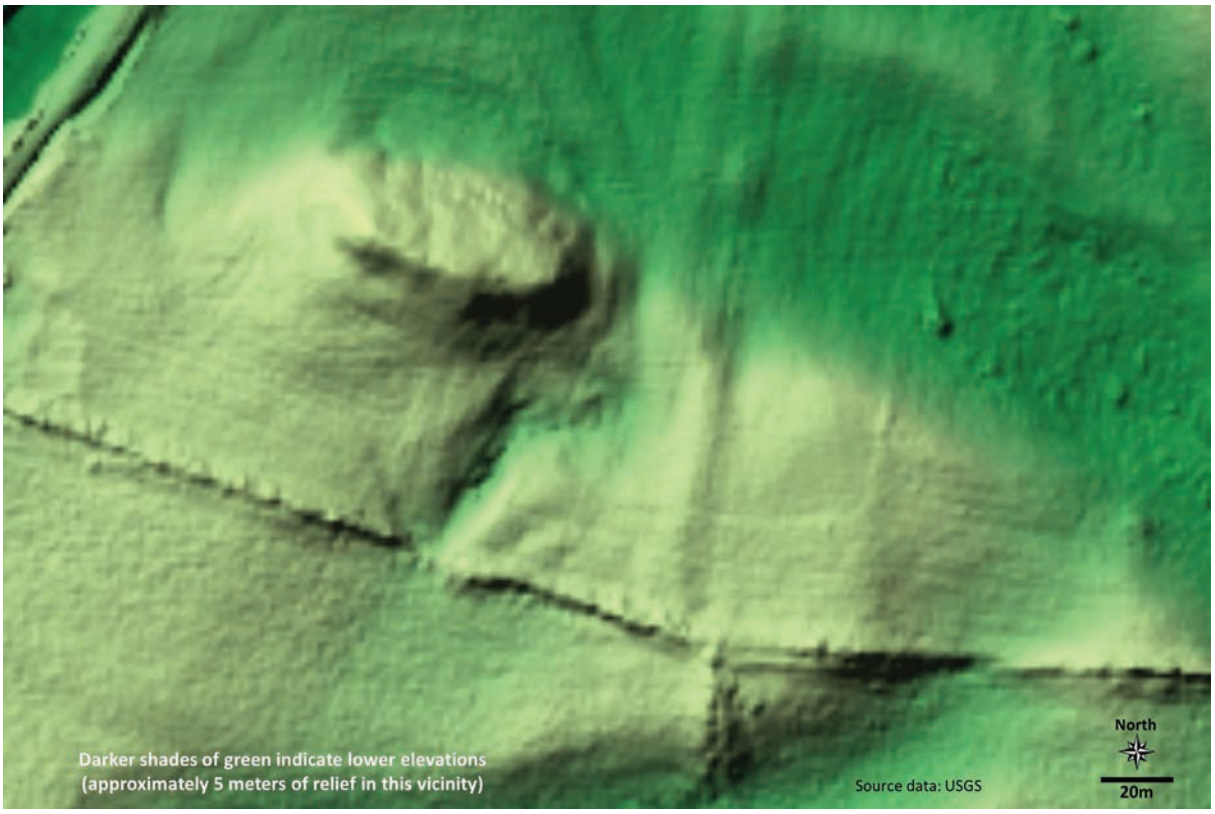

Figure 3. Hypsography for the study area.

the original unprocessed data, the interpreted structures range in magnetism from approximately 10 to 20 nanotesla. Interpreted hearths measure approximately 50 nanotesla.

In addition, the data present numerous magnetic anomalies consistent with hearths, pits, posts, and possibly burials. A very regular line of relatively large, evenly spaced, anomalies southeast of the mound (cyan blue dots in Figure 5) suggests planning. This pattern could represent a demarcation between the sacred ceremonial space and the profane "outside." There are numerous smaller discrete anomalies that compel additional quantification and interpretation.

Long linear anomalies in the central portion of our data coverage conform to a topographic low area that is largely devoid of magnetic anomalies save small bits of metal. It is not yet clear to us whether this low area is a borrow pit where earth was taken for building the mound or modern disturbance.

Based on our current information, there are notably fewer anomalies east and west of the intensively used, primary mound area. This suggests a core civil/ceremonial center set apart. The degree of separation is yet to be determined. The gradiometer data for an elevated area east of the mound and separated by a depression provide evidence of off-mound activity. We interpret this as at least one structure in the eastern area, along with a concentration of smaller as-yet unidentified cultural features (red arrow and dashed yellow oval in Figure 5).

In the future, we plan to extend the gradiometer coverage to further delineate site extents, using multi-sensor surveys to corroborate features and further elucidate activity areas.

Conclusions

Site 3HS22 features one of the largest Caddo mounds remaining in Hot Spring County, Arkansas. It is currently protected by the property owner and well-managed with a cover of pasture grass. We do not plan any archaeological excavations in the mound, especially since we know it was once used as a burial place in addition to its architecture. Arkansas now has a burial

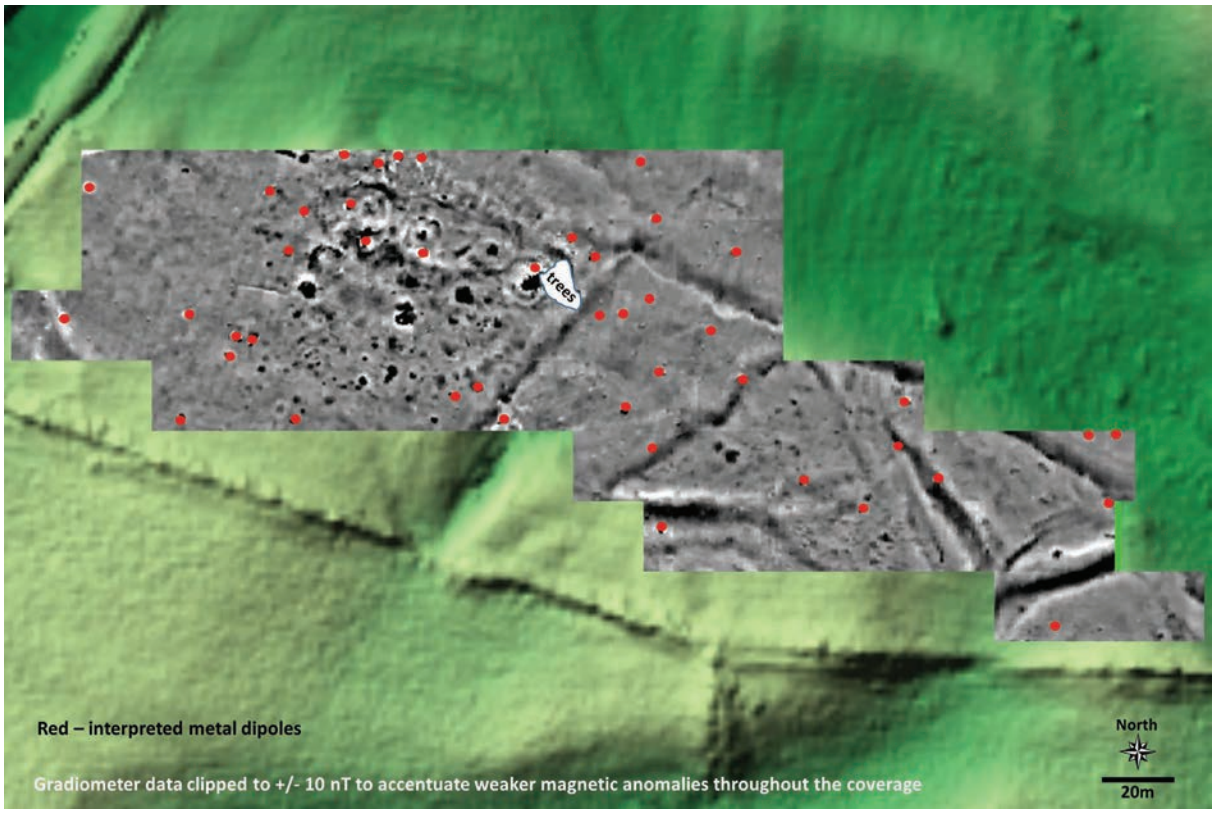

Figure 4. Gradiometry identifying probable metal dipoles. Darker shades indicate increased magnetism.

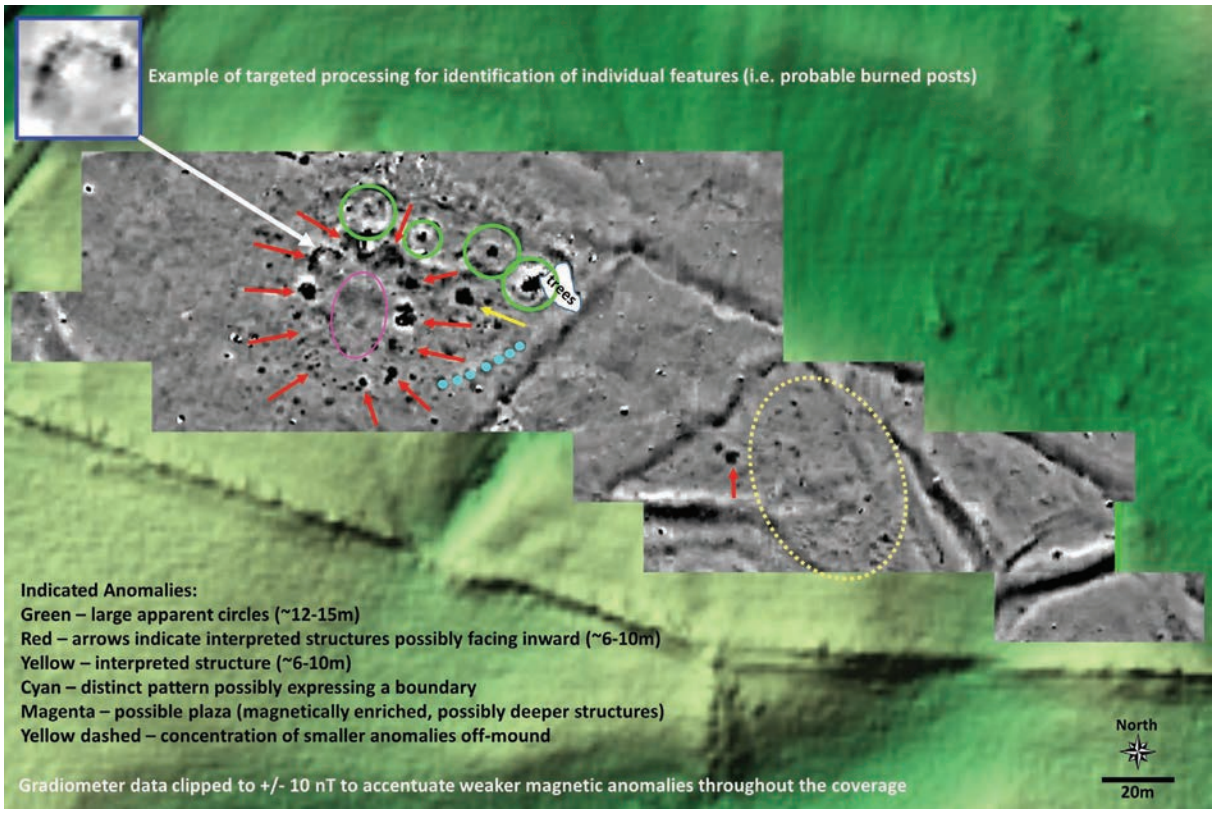

Figure 5. Gradiometry with select interpretations. Darker shades indicate increased magnetism.

law that protects graves – marked and unmarked – in cemeteries from all time periods.

With this project, we are using archaeogeophysical surveying techniques to document the spatial patterning of the mound at 3HS22 and its larger community. We have identified multiple anomalies interpreted as burned structures still present in or below the mound remnant. Two new radiocarbon dates established the age of two burned structures destroyed in 1976, placing their construction in the 1300s to early 1400s, early in the Mid-Ouachita phase of the Caddo tradition. The burned structures identified by the gradiometry survey thus date prior to that, likely during the East phase. The work has identified additional anomalies beyond the mound that may be residues of cultural constructions such as houses or pits. Further away lies 3HS406, an East to Mid-Ouachita phase farmstead.

We plan to continue documentation of the larger cultural landscape at 3HS22 using archaeogeophysical surveying. This work will help to interpret the site, enhancing its continued preservation. The information gained can bring further awareness of the history and significance of this place to contemporary Caddo people in Oklahoma and to the local community in Arkansas.

Acknowledgments

The ARAS Hester Davis Fund subsidized the AMS dating of samples by Beta Analytic, Inc., reported here. Thank you to Gunnar Shaffer for his assistance in the field during the 2021 mapping and archaeogeophysical surveying at 3HS22. The photographs and data from this project are curated at the Arkansas Archeological Survey in Fayetteville and in Arkadelphia.

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Current Research:
University of Arkansas Summer 2021 Field School at Watts Farm (3WA6), Washington County, Arkansas

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Arkansas Archeological Survey

Between June 30 and July 30, 2021, the University of Arkansas-Fayetteville Research Station of the Arkansas Archeological Survey (ARAS) directed an archeological field school for the University of Arkansas Department of Anthropology at Watts Farm (3WA6), a multi-component non-mound site located in the White River valley near Durham, Arkansas. Watts Farm was selected for the archeological field school for its potential to produce architecture and material culture related to the Woodland-to-Mississippi period transition in the Ozarks. The Ozarks of northwest Arkansas lie between major Mississippian culture areas, including the Arkansas River valley to the south and west, the Central Mississippi valley to the east, and the American Bottom to the northeast. Understanding the complex interplay between local and external cultural influences leading to culture change during the centuries around AD 1000 is an important research topic for the region, and investigations at a non-mound site dating to this period can offer data on how daily life in the Ozarks may have changed during the onset of the Mississippi period in the Southeast.

Previous Investigations and Research Design

Watts Farm is approximately 5 km south of the Collins Mounds (3WA1) on a terrace directly above the modern channel of the White River. Watts Farm was first recorded in the 1930s by Samuel Dellinger with the University of Arkansas Museum. Dellinger's crew uncovered two burials with T-shaped ground stone pipes, as well as a feature that Dellinger referred to as an "earth house" (Notes on file, University of Arkansas Museum). Beyond a rough sketch in Dellinger's notes, the basic characteristics of the earth house are unknown, including the size and shape, and if other structural features were found, such as post molds or wall trenches. Artifacts recovered from the floor of the earth house include thick-walled plain grog-tempered ceramics typical of Woodland period assemblages in northwest Arkansas (Sabo et al. 1992), fragments of large stone hoes, a single blade core made of Burlington chert, and two bone tools. A few scattered pieces of shell-tempered pottery were also recovered on the floor of the structure, including one thin shell-tempered shallow bowl sherd, a vessel form atypical of Late Woodland pottery assemblages in the region. Although the Ozarks are known for a precocious shell-tempered tradition (Sabo and Hilliard 2008), these shell-tempered ceramics appear to be good candidates for imports based on the unusual thinness and shape. Because these shell-tempered sherds were found in association with locally made, thick-walled grog-tempered pottery, the earth house is suspected to date to the Woodland-to-Mississippi period transition in the Ozarks. Furthermore, the site may be contemporaneous with the occupation at the Collins Mounds, and the Watts Farm residents may have provided mound construction labor. Wood charcoal samples from buried mound surfaces at Collins have produced radiocarbon dates with 2-sigma calibrated ranges between AD 700–1200 (Angeles 2016).

In 2008, archeologists with the ARAS revisited Watts Farm in an attempt to relocate Dellinger's excavations. Jerry Hilliard, Michael Evans, and Jared Pebworth excavated a series of shovel tests in the central portion of the site. Hilliard felt reasonably confident that Dellinger's earth house was encountered in the shovel

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testing, as some tests produced fired clay and evidence of a dense midden. Dr. Jami Lockhart conducted a magnetic gradiometer survey of 9,200 m² (close to 1 ha) across a portion of the site, and encountered anomalies in the geophysical data that could represent architecture (Notes on file, ARAS Coordinating Office) (Figure 1).

The suspected dates of occupation, the potential for encountering ancient architecture, and the possible association of Watts Farm with the Collins Mounds made the site an excellent candidate for a field school project examining the broader Mississippian settlement system in the Ozarks. Specific research questions were

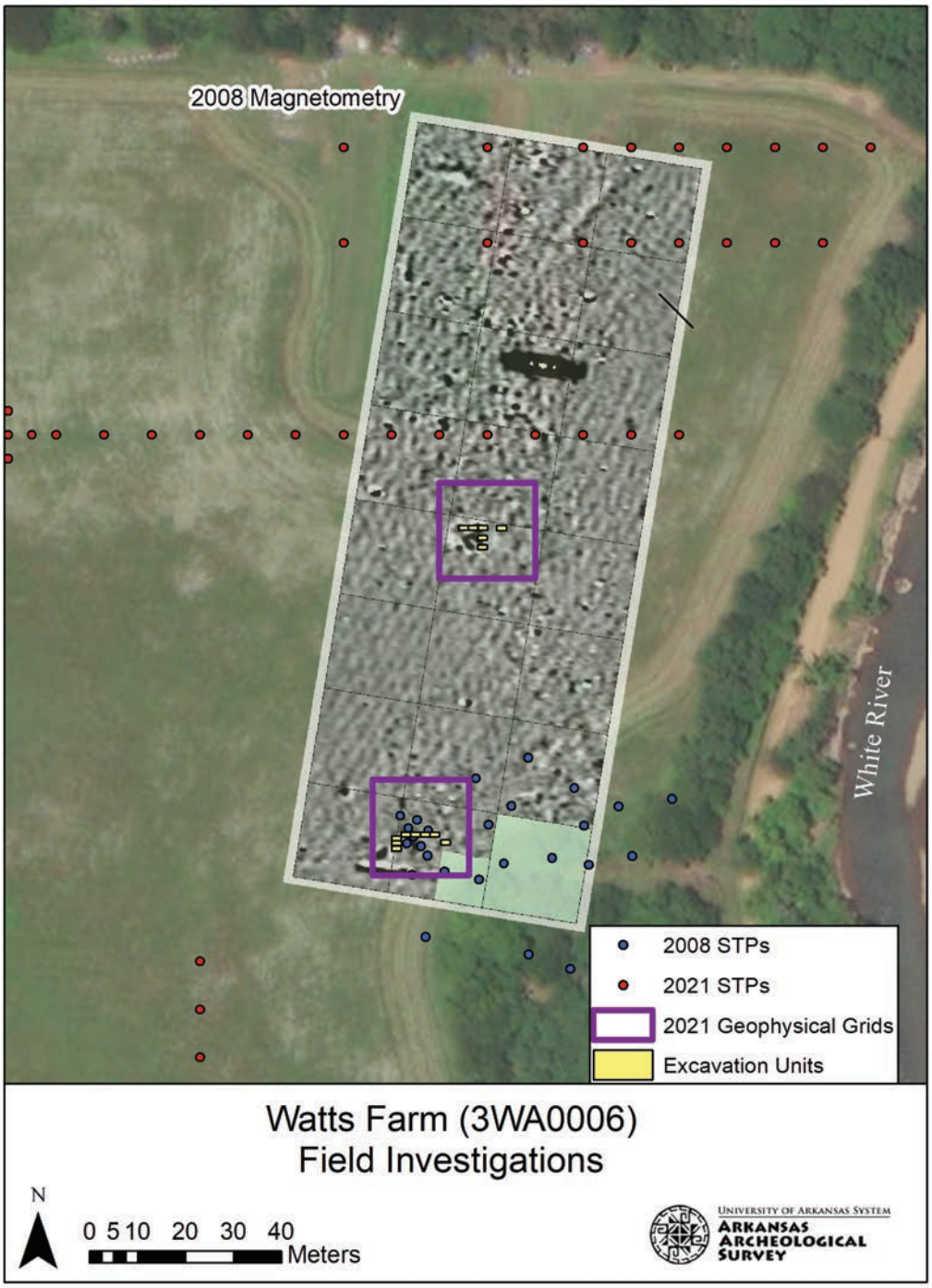

Figure 1. ARAS fieldwork to date at Watts Farm.

outlined for the Watts Farm field school including the following: Is Watts Farm a residential site and what is the density of occupation? What are the dates of occupation and was Watts Farm occupied at the same time as the nearby Collins Mounds? In other words, are Watts Farm and the Collins Mounds part of the same cultural landscape? What is the style of architecture at Watts Farm and how does that style of architecture compare with architecture found at other Ozark mound centers, including special-purpose buildings documented at Goforth-Saindon (3BE245) and Huntsville (3MA22) (Kay and Sabo 2006)? How do structures found at Watts Farm exemplify or deviate from broader styles of Woodland and Mississippi-period architecture in Arkansas? What are the range of activities associated with the Watts Farm site, and more specifically, is there evidence that residents of the site were engaged in intensive maize agriculture, horticulture, or engaged in nut and other wild food gathering? How did subsistence practices change during the Woodland-to-Mississippi period transition in the Ozarks?

Methods and Results

First, 49 shovel test pits were excavated to delineate the boundaries of the site and document artifact concentrations. Although limited in scope, the shovel test data indicates the site extends up to the property line on all sides, and likely beyond, covering at least 8 ha (see Figure 1). Most shovel tests produced between 5 and 15 pieces of debitage, and few shovel tests produced discarded projectile points, including Archaic and Woodland types. The site is multi-component, probably reflecting a series of short-term occupations over time. No ceramics were recovered in shovel tests.

To address the research questions outlined above, a field program informed by geophysics, targeted excavations of anomalies, recovery of artifacts and botanical remains, and lab analysis focused on isolating site components was proposed for the summer field school with the primary goal of targeting the earth house. The 2008 broad-area gradiometer survey was used to locate a more spatially limited multi-sensor geophysical survey for the field school (Gaffney and Gater 2003; Johnson 2006). Based on the 2008 data, two 20 x 20 m areas were selected for investigation. The dual purposes of the work were to guide the location of excavation units during the field school and to introduce students to methods and capabilities of near-surface prospection through hands-on experience.

A Bartington 601-2 gradiometer was used to locate thermoremanent and induced magnetic anomalies interpreted as burned and culturally enriched archeological features. The data were collected at 0.01 nanotesla sensitivity, using a sampling resolution of 12.5 cm along 20 m traverses spaced 50 cm apart. Using TerraSurveyor software, the data were de-striped to remove heading errors, de-staggered for better alignment between traverses, and interpolated to 12.5 cm x/y resolution. Magnetic magnitude for each reading was examined as collected in the field, as well as histogram-clipped to accentuate magnetic contrast and enhance pattern recognition. Magnetic readings for confirmed archeological features measured between 25 and 41 nanotesla.

Ground-penetrating radar was used to detect subsurface elements of the prehistoric built environment. A SIR 3000 (GSSI) instrument equipped with a 400MHz antenna was used to collect 100 samples per meter along 50 cm traverse intervals producing 40 radargrams per 20 m grid. Using Radan software, the radargrams were examined individually, combined for 3D representations, and viewed as time slice (time-depth) windows.

Finally, electrical resistance was used to detect differences in soil moisture and composition indicating past anthropogenic disturbances, such as past digging, piling, differential compaction, and buried stone constructions. A Geoscan RM15 with multiplexer was used to collect these data at 50 cm sample and traverse intervals, and then processed using Geoplot software to despike, filter, and interpolate. Resistance readings ranged from 63 to 265 ohms.

The resulting data corroborated previous work and enhanced interpretations by providing additional information as exemplified in Figure 2. Ground penetrating radar delineated a contiguous 64 m² hard target at approximately 50 cm below surface in the northernmost geophysical grid. Additional anomalies, or an anomaly cluster, were interpreted in the southernmost 20 x 20 m geophysical grid. Gradiometry and electrical resistance data indicated a north-south trending 1 x 2 m anomaly that proved to be a prehistoric hearth feature,

discussed below. Additional magnetic anomalies in the cluster guided excavations east of the hearth, revealing an east-west trending midden.

Based on the results of the geophysical data, anomalies in both grids were targeted for excavations. The northern anomaly, or Feature 1, was partially exposed with 12 m² of horizontal excavations. Feature 1 was encountered just beneath the plow zone and consisted of a dense concentration of fire-cracked rock (FCR). This dense concentration of FCR was approximately 8 x 8 m in size, and extended to a depth of 50 cm below the ground surface at its central point. The feature appears to be slightly basin-shaped and thins towards the outer edges. FCR ranged in size from

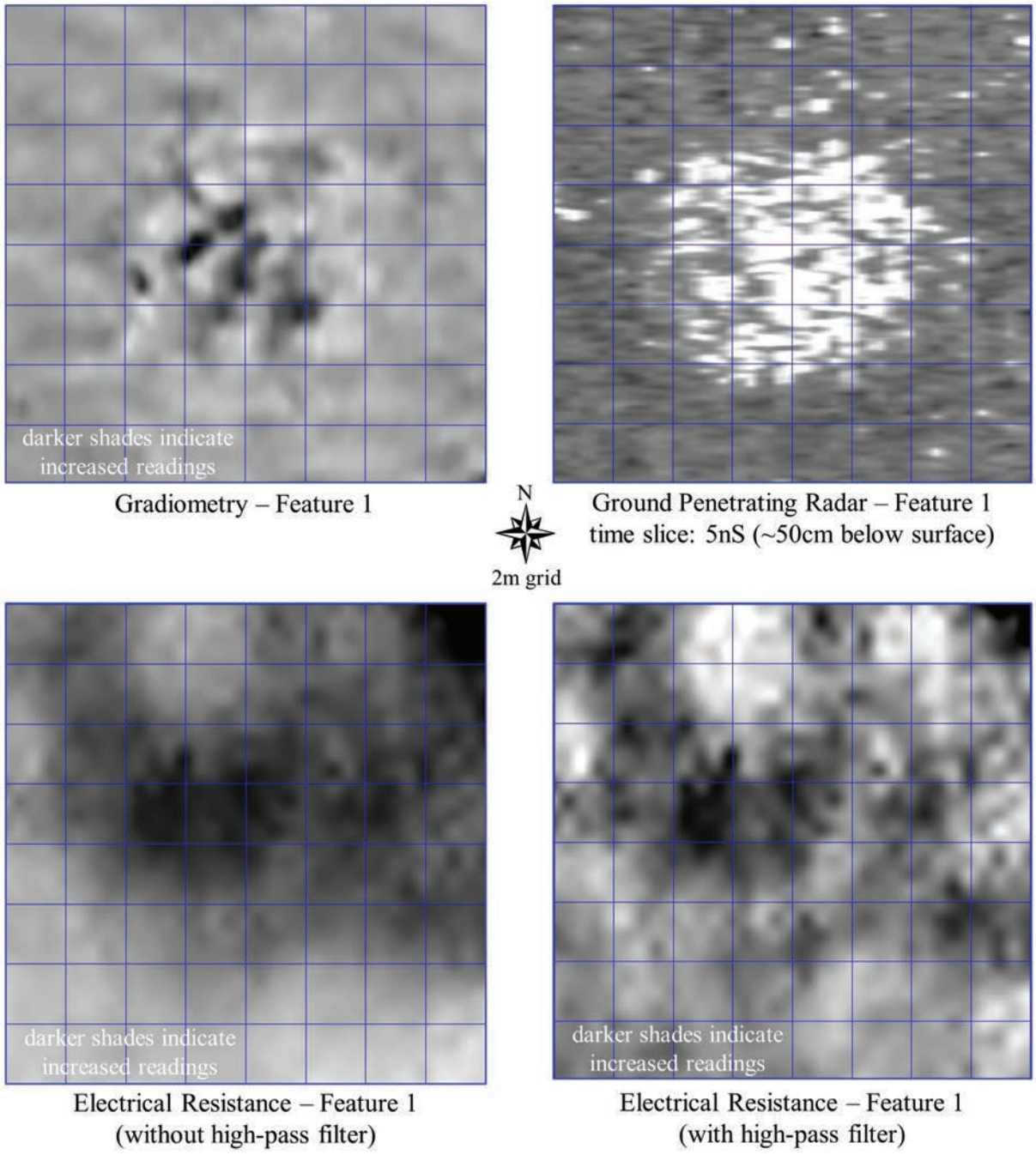

Figure 2. Multi-sensor geophysics for 3WA6 Feature 1.

small pebbles to softball and brick-sized pieces, clearly brought onto the terrace surface. Artifacts recovered from the feature include primarily late-stage debitage. One tool was recovered from a thin layer of cultural material beneath the feature, an Archaic Jackie point. However, a single radiocarbon date on wood charcoal recovered in association with the feature returned a 2-sigma calibrated range of AD 1025–1159. Although the analysis of the artifacts is on-going, this feature likely represents a large cooking feature. Organic preservation was poor, and no faunal or botanical remains were recovered from this area of the site.

The southernmost series of anomalies were tested with 16 m² of horizontal excavations. At the west end of the investigations, the remains of a small prepared clay surface or hearth, about 80 x 50 cm in size and heavily damaged by plowing, were exposed. No structure walls were encountered. Immediately to the east of this hearth a midden deposit was encountered that extended for approximately 8 m, reaching depths of 80 cm below the ground surface. This midden appears to have filled in an ancient paleochannel, and produced late-stage debitage, thick heavy-walled grog-tempered pottery, fragments of stone hoes, low-fired clay fragments, nutshell, and fragmentary bits of bone. Three radiocarbon dates on carbonized nutshell from between 40 and 80 cm below the ground surface returned virtually identical 2-sigma calibrated age ranges between AD 670–880, suggesting quick deposition.

Although the site is multi-component, there is substantial occupation at the site between AD 700–1200 as exemplified by the midden deposit. However, these Woodland and transitional components are not particularly dense or spatially expansive, nor does the archeology indicate the site functioned as a residential village. Rather, the site appears to be a special-purpose extraction locale, primarily used for harvesting and processing nut-mast. Architectural elements were not encountered during the field season, indicating the site may have not have been occupied permanently, but instead represents a series of discrete occupations over time. Dellinger's earth house may represent single-family use of the site during the Woodland-to-Mississippi transition. A dispersed pattern of settlement may characterize the Ozarks for much, if not all, of its ancient history. At this point, evidence of regional consolidation more typical of the Mississippian heartland is lacking for the Ozarks based on work at Watts Farm.

Acknowledgments

This field school project was supported with a Teaching Improvement Grant from the University of Arkansas and an Arkansas Archeological Society Research Fund Grant.

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Current Research:
The Potential Horizon Astronomy at Caddo Mounds

Gordon L. Houston
Independent Scholar

Evidence of the astronomical practices and sun watching of Native Americans have been reported and recorded all across North America. While doing research at Paint Rock (41CC1), a pictograph site in West Texas, there was evidence of cultural contact with the Caddo peoples. There are reports of possible astronomical practices at Caddo Mound State Historic Site, a Caddo cultural site (41CE19). There are similar reports of possible astronomical practices at Cahokia (11MS2/11S34), the largest Mississippian mound complex. This led to performing an archeoastronomy survey at Caddo Mounds, and the findings of that archeoastronomy survey are reported.

The Caddo Mound State Historic Site, or George C. Davis site, is in Cherokee County in East Texas. There are three mounds at the site, the central temple mound (B), a burial mound to the north (C), and a high temple mound (A) to the south. It covers 112 ha, and is one of the largest Native American site in Texas (Story 1981). According to Perttula (2004) the site was established around the beginning of the Formative Caddo period (ca. AD 800–1000), and was inhabited into the Middle Caddo (ca. AD 1200–1400) period. It is bordered to the west and southwest by Bowles Creek and to the southeast by Foreman Lake; both drain into the Neches River (Fields 1978). The Caddo Mound complex came to my attention while doing an archeoastronomy investigation at the largest pictograph site in Texas, Paint Rock, and the primary research site for my PhD studies (Houston 2020).

There was evidence of cultural contact at the site as there was Caddo pottery found in the middens at Paint Rock (Turpin et al. 2002). Jackson (1938) indicated there were several pieces of pottery from graves in northeast Texas with an exact design of a Paint Rock pictograph. The design was a hatched concentric circle sun emblem. Cahokia, the largest Mississippian mound complex, has evidence of sun watching (Foster 2008; Young and Fowler 2000). There are reported cultural similarities between the Caddo Indians and the Mississippians of Cahokia (Foster 2008), including mound building, sun worship, cultivated crops, and sun watching. I decided to do a formal archeoastronomy site survey at Caddo Mounds.

Native American Astronomy

Evidence of Native American astronomy is widespread across the continent (Aveni 1975; McCluskey 1977, 1993; Eddy 1978, 2008; Williamson 1987; Zeilik 1984, 1985a, 1985b, 1989). This evidence takes many forms. Many sites have elaborate structures built to make astronomical observations, including Cahokia, Casas Grande, Chaco Canyon, and the Caddo Mounds State Historic Site (Foster 2008). Young and Fowler (2000) discuss an earlier earthwork site in northeast Louisiana, Poverty Point (16WC5), which they state has alignments to the solstices.

At Cahokia, there was speculation that there existed possible "woodhenges" that were named as such after Stonehenge in England, and reported in many books and articles (Eddy 1978; Foster 2008; Taylor 2012; Young and Fowler 2000). Then Creel (2001), following up on the identification of post holes by Fields (1978), suggested a possible "woodhenge" at the Davis site. These circular structures have since been disregarded as astronomical observatories, and are considered a result of simply chance alignments (Taylor 2012).

However, Melvin Fowler discovered an

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important aspect of the layout of Cahokia, which shows the layout of the city along cardinal directions. He noted that the city has a north-south axis that runs along the massive Monks Mound, through the Central Plaza, and in between the "Twin Mounds" on the south side of the plaza (Young and Fowler 2000). It is interesting to note that offset from this axis is Mound 48, west of the plaza. It will be shown that the Caddo Mounds site has a very similar layout.

Horizon Astronomy at Caddo Mounds

The evidence of Native American astronomy is sufficient to say that most cultural groups had some form of sun watching priest, shaman, or a designated sun watcher. Sun watching along the horizon provided important subsistence information for hunter-gathers, as well as agricultural societies. Sun watching along the horizon provided cultures their first temporal framework, long before any structures would have been built to assist and record the sun's movement. Hence, the decision to do an archeoastronomy field survey at Caddo Mounds to determine the potential horizon astronomy there.

Methodology

Using standard archeoastronomy field methods, tools, and equipment, as outlined in Houston and Simonia (2017), fieldwork was performed on six separate visits to the site. The tools and equipment included a Brunton transit, a Suunto combination sighting compass and clinometers, a Canon 40D camera, a Casio atomic watch, a stopwatch, and a Nikon NE-103 electronic theodolite. Prior to the first visit, a preliminary survey using on line tools provided the information to plan the field survey.

First, the web-based surveys consisted of examining both a satellite image and topographic map of Caddo Mounds (Figures 1 and 2). Figure 1 is a satellite

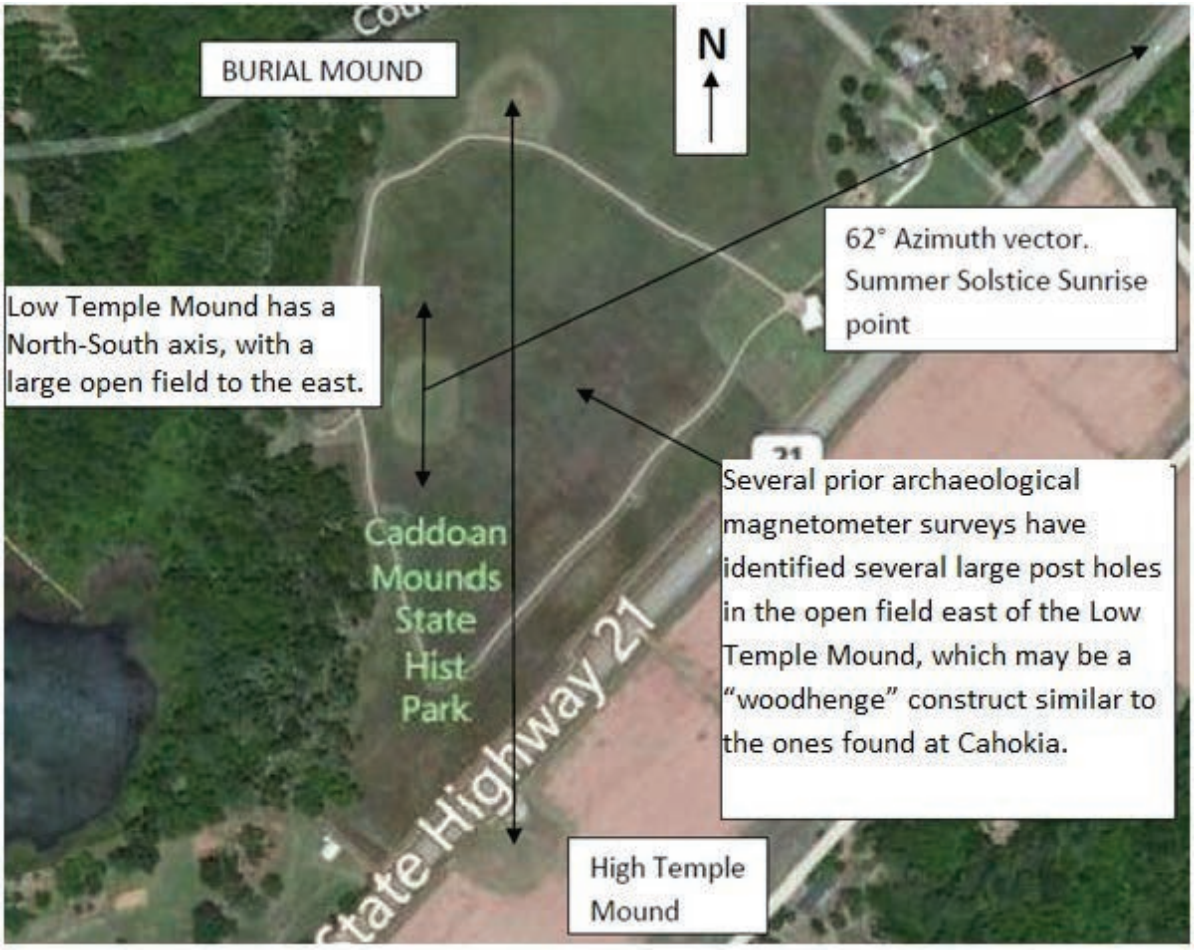

Figure 1. Satellite view of Caddo Mounds State Historic Site (ACMEweb 2020, adapted from Houston 2020).

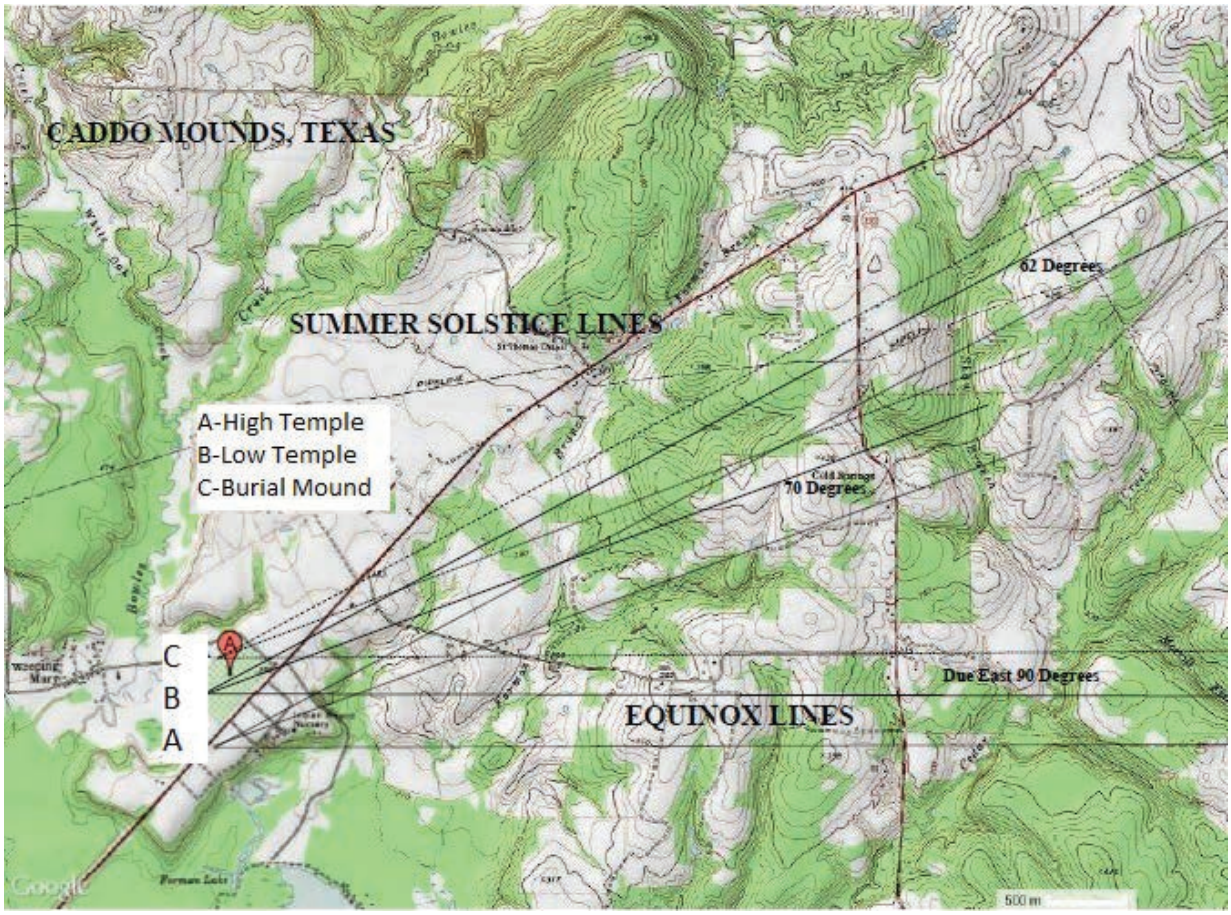

Figure 2. Horizon lines extending from the three mounds (map from ACMEweb, adapted from Houston 2020).

view of Caddo Mounds from the ACMEweb. Using the online image, moving to align the tallest point on the Burial Mound and the High Temple Mound, the longitude readings were almost identical. The change in readings was only 0.00073 thousandths of a degree, which means these two mounds appear to have been aligned to each other on cardinal directions, north and south. Additionally, the Low Temple mound was checked, and although it was offset from the north/south line of the two other mounds, it was oriented north to south. Thus, the general layout of the site suggested astronomical knowledge of the builders because they are oriented to the local north-south meridian (Houston 2020). This layout has similar characteristics as at Cahokia.

The second view used from the ACMEweb was the topographic map. Figure 2 shows Caddo Mounds and potential horizon lines extending towards the Summer Solstice and both equinox rise points. The horizon arc was calculated using the following formula:

$$\alpha = 2 \times 23° 26' 29"/ \cos \varphi$$

The horizon arc at Caddo Mounds is 55.284°, the travel distance along the horizon of the sun from Summer Solstice (SS) to Winter Solstice (WS). The topographic map (Figure 2) was used to attempt to determine potential sunrise and set points against the horizon terrain. The eastern horizon offered the best irregular topography. The eastern solar arc extends from 62° 21' 29" to 117° 38' 31". The two directions that offered the most promising possibilities of the sun rising against a significant horizon point were the Summer Solstice (SS) and the Vernal and Autumnal Equinoxes (VE, AE). Having done the preliminary survey, it was time to proceed to the site for field surveys.

Archeoastronomy Field Survey

On the first of four trips to evaluate, measure, and photograph the horizon from various potential points of observation, the challenge was obvious. Caddo Mounds

is located in the East Texas Piney Woods ecoregion. Hence, the horizon contained within the solar arc was not visible. Significant banks of trees and hedges obscured the horizon sight lines. Photographs were taken of the east and west horizon for further study. One trip was taken in late March, with the maximum amount of foliage off the trees from the winter. However, some trees such as pines and live oaks, do not lose their leaves.

As shown in Figure 2, the east equinox rise point, and the Summer Solstice rise point, had some potential horizon features that the sun would interact with on those dates. The best points of observation were from the Low Temple Mound and High Temple Mound. There was no evidence to suggest a sun watcher would have watched from the Burial Mound. Study of the horizon and the photographs taken suggested that it would be difficult to confirm the equinox sunrise by ground truthing; ground truthing is making observations and taking photographs confirming the horizon astronomy. The discussion of the "woodhenges" at Cahokia stated that they had watched the Summer Solstice sunrise and the observers central post was offset specifically to observe this sunrise. The observation of the northeast topography suggested that the Summer Solstice sunrise may be visible against the horizon. The height of the High Temple mound suggested that it may allow a ground truth photograph on the Summer Solstice.

The photographs taken before the start of spring produced the best view of the northeast horizon. There is a bluff that rises about 23 m (75 ft) as the sun would travel to its furthest point north at the Summer Solstice (SS). Several trips were taken to do theodolite measurements of the horizon; the theodolite is used to convert geographic azimuths to celestial declinations. Figure 3 (see Houston 2020) shows the horizon points for the Summer Solstice sunrise. The theodolite is calibrated by taking sightings of the sun with a solar filter attached (Table 1 and Figure 3). The sun sights correct the setting of the theodolite so that horizon azimuths are corrected when converting to celestial declinations (Table 2 and Figure 3).

The declination at the top of the bluff was determined to be 23° 25' 30.6", almost exactly the declination of the sun's farthest travel north, which is 23° 26' 29". Having measured that point, it is clear that this would be a sun rise confirmation for the Caddo on the Summer Solstice. Point #2 on the horizon is at the base of the bluff. The declination was determined to

TABLE 1. Caddo Mound-High Temple Mound-March 12, 2014

	TIME	VA	HA	USNO-MICA	Δ-HA
LF #1	14:31:11.8	52 24' 10"	204 49' 50"	205 27' 248"	0 37' 34.8"
LF #2	14:32:35.9	52 16' 15"	205 21' 40"	205 59' 20.4"	0 37' 40.4"
RF #1	14:34:42.4	52 04' 20"	206 09' 45"	206 47' 00.3"	0 37' 15.3"
RF #2	14:36:24.2	51 54' 35"	206 47' 55"	207 25' 02.6"	0 37' 27.6"
				STD Error	0 37' 29.5"

TABLE 2 CADDO MOUNDS-SUMMER SUNRISE HORIZON

	HA (*A*)	VA (*h*)	Refraction	VA (h) corrected	Declination
#1	62 28' 45"	00 51' 10"	00 27' 00"	00 24' 10"	23 25' 30.6"
#2	62 47' 28"	00 31' 35"	00 29' 00"	00 02' 35"	22 57' 51.2"

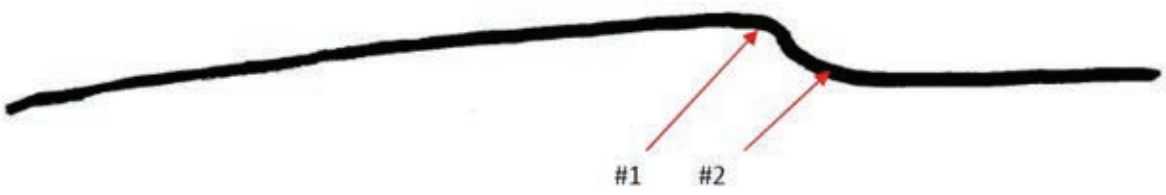

Figure 3. Horizon survey of the northeast SS sunrise points (Houston 2020).

Figure 4. SS sunrise confirmation photo showing the sun at the top of the bluff (Houston 2020).

be 22° 57’ 51.2”. Using a celestial planetary program, SkyWatch, the sun would reach the base of the bluff, point #2, 12 days before the Summer Solstice sunrise. This would be an anticipatory point for the preparations of any rituals or ceremonies held at the summer solstice. Having performed the archeoastronomy investigation and survey and determined the horizon astronomy, the last thing to perform was a ground truth of the data. A trip on the morning of the Summer Solstice 2014 was clouded out. The trip on the Summer Solstice 2015 produced the photograph of the sun at the top of the bluff shown in Figure 4. Hence, this is a confirmation of the potential horizon astronomy at Caddo Mounds.

Conclusions

Evidence of the astronomical practices by Caddo peoples at Caddo Mounds is supported by this archeoastronomy investigation. The layout of the mounds along a north-south cardinal meridian and the confirmation of the potential horizon astronomy suggests the sun watching skill of the Caddo people. It is hoped that this study will lead to further investigation of astronomical practices at Caddo Mounds State Historical Site and other Caddo mound centers.

Acknowledgments

I want to thank the Texas Historical Commission for allowing this archeoastronomy survey to happen. I also want to thank the Site Manager, Anthony Souther, for his input and valuable assistance at the site. Thanks to Timothy K. Perttula for his valuable comments and review of the initial draft, and Mary Beth D. Trubitt for her help and patience with this paper.

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Book Review:

Two Caddo Mound Sites in Arkansas, by Mary Beth Trubitt, with a contribution by Lucretia S. Kelly. Research Series No. 70, Arkansas Archeological Survey, Fayetteville, 2021, x + 205 pp. ISBN 978-1-56349-112-2.

Timothy K. Perttula
Archeological & Environmental Consultants, LLC

This monograph by Mary Beth Trubitt represents a significant contribution to the understanding of the native history of the Caddo peoples that lived in Arkansas between the thirteenth and seventeenth centuries AD. It concerns the archaeological study of two Caddo mound sites in southwestern Arkansas—Hedges (3HS60) in the middle Ouachita River valley and Hughes (3SA11) in the upper Saline River valley—excavated by the Henderson State University Research Station of the Arkansas Archeological Survey in 1973–1974 and 2002, directed by Ann Early in the earlier years and Mary Beth Trubitt in 2002.

This research has provided an excellent opportunity, realized in this publication, to compare and contrast the use of the two sites in terms of the construction of buildings next to the main mound at both sites (Chapters 2 and 3), along with a detailed analysis of the character of both the utility and fine ware ceramics (Chapter 4) and lithic tools and debris (Chapter 5) recovered in the archaeological deposits; almost all of the lithic artifacts were made from locally available novaculite. Also discussed in the monograph is the analysis of the faunal materials recovered at the Hughes site, the worked bone, anther, and shell artifacts from both sites, and the floral remains at both sites (Chapter 6). The final chapter, Chapter 7, summarizes the activity patterning and community structure detected at both the Hedges and Hughes sites, and then looks at wider connections between the two sites and Caddo sites to the west and Mississippian sites to the east.

Of particular interest in the excavations were the uncovering of near mound structures that had been covered by artifact-laden midden deposits after being burned. Trubitt (p. 126) suggests "that activities in these structures were linked with activities that took place on the mounds, but these buildings were not treated in the same ritual fashion at termination as were structures buried by mounds." Based on the range of artifacts recovered in these building deposits, Trubitt further suggests that these buildings may have been where foods were prepared for feasts and rituals that were taking place on the mounds and mound buildings; they were nor ordinary buildings.

At the Hughes site, there were superimposed buildings marked by burned soil, ash, daub, and charcoal (including burned timbers), as well as post molds and many artifacts, especially ceramic vessel sherds, chipped stone tools and debris, animal bones and charred plant remains. Two of the three radiocarbon dates from the excavations were earlier than thought (calibrated age intercepts of AD 1290 and AD 1300), based on the Late Caddo period ceramics and arrow points recovered, and may reflect the use of charred log timbers for dating that may have been from old wood rather than the dating of charred annuals such as maize or nutshells. The third date has a calibrated median probability of AD 1503. More radiocarbon dates on charred annuals may be warranted from the Hughes site to clearly establish the ages and temporal span of these near mound buildings. A similar set of stratified buildings were encountered in near-mound contexts at the Hedges site, with burned clay and structural debris, daub, charred cane, thatch, bark, post molds, as well as midden deposits; two crushed ceramic vessels were found on the floor of one

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of the burned structures. The one calibrated radiocarbon date on maize kernels from the excavations at the Hedges site has a calibrated median probability of AD 1663. An archaeomagnetic date of AD 1450–1535+ was returned from the baked clay floor in Feature 5, an upper strcture in the deposit.

Faunal remains in the deposits from the Hughes site are dominated by mammals, especially deer, but some fish (gar) and birds (such as turkey and passenger pigeon) had also been procured along with box turtle. The Hedges site faunal assemblage remains to be studied in detail. Both sites have bone/antler projectile points, antler tine flakers, bone ornaments, and modified bone (including a bone earspool and a hair pin), turtle shell, and mussel shell (perforated hoe) artifacts. The studied floral remains from the two sites include maize, beans, hickory and acorn shells, wild grape and plum, persimmon, and hackberry and gromwell seeds. Maize was a principal component of the diet of the agricultural Caddo populations that lived at the two sites.

Trubitt's conclusions to the report focus on activity patterning and community structure at the Hedges and Hughes sites. In the case of activity patterning in and near the off-mound structures, this included food preparation and consumption, construction, farming or digging, hunting and/or warfare, crafting tools or clothing, and body ornamentation. Community structure at the two sites centered on the principal mounds at each, oriented north-south or northeast-southeast, with associated burned structures and middens near the main mounds, along with cemeteries; there is a borrow pit east of the main mound at the Hedges site (see Figure 95). The occupations of these two mound sites are important parts of both the Social Hill (AD 1500–1600) and Deceiper (AD 1600–1700) phase communities in the Ouachita River and Saline River valleys.

This publication is a data-rich monograph of the findings from the excavations of near mound burned structures and midden deposits at two generally contemporaneous Caddo mound centers. The sites have well-preserved features, along with abundant assemblages of ceramic vessel sherds, lithic tools and manufacturing debris, animal bones and tools, and both domesticated and wild plant foods procured, processed, and consumed by the Caddo populations of southwest Arkansas. It is a valuable and substantial publication that will be of considerable interest to archeologists (both professional and avocational), the Caddo peoples of the Caddo Nation of Oklahoma, and members of the public that want to know more about the Native history of this part of the Caddo area. I highly recommend it.

Index:
Caddoan Archeology Newsletter, *Caddoan Archeology*, *Caddoan Archeology Journal*, and *Caddo Archeology Journal* (1989–2021)

Duncan P. McKinnon
Jamie C. Brandon Center for Archeological Research and University of Central Arkansas

This index includes articles, current research reports, book reviews, Caddo Conference reports, Caddo Culture Club reports, and reprints from *The Oklahoma Prehistorian* that have been published in the *Caddoan Archeology Newsletter* (1989–1996), *Caddoan Archeology* (1996–2002), the *Caddoan Archeology Journal* (2003–2005), and the *Caddo Archeology Journal* (2006–2021). It expands upon indices published in 1996, 2001, and 2008.

The journal began as the *Caddoan Archeology Newsletter* in 1989 and in 1996 the name changed to *Caddoan Archeology*. In 2003 the name was changed again to *Caddoan Archeology Journal,* and in 2006 the name was changed to *Caddo Archeology Journal.* Tim Perttula was founder and editor from 1989 until 1993 when Lois Albert became editor. Tim Perttula resumed his editorial role in 2002 until 2008. In 2009 George Avery began as editor and served in that role until 2015. Beginning in 2016 Duncan McKinnon was editor for five volumes. In 2021 Mary Beth Trubitt became editor and currently serves in that role.

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