

# **The Andy Kyle Archeological Collection**



# **The Andy Kyle Archeological Collection**

**Sam Houston Regional Library  
and Research Center,  
Liberty, Texas**

*Wilson W. Crook, III, Editor*

**Houston Archeological Society**

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*Front Cover:*

*Top: Sam Houston Regional Library and Research Center, Liberty, Texas*

*Bottom (left to right):*

*(1) Louis F. Aulbach and Bob Sewell examining ceramic sherds at the Sam Houston Regional Library and Research Center,*

*(2) Andy Kyle,*

*(3) Ms. Alana Inman, Manager of the Sam Houston Regional Library and Research Center,*

*(4) Bob Sewell, Linda Gorski and Dub Crook working on the Kyle Collection in the archives at the Sam Houston Regional Library and Research Center.*

## Editor's Foreword

The *Houston Archeological Society Report No. 29* is a publication of the Society. Our Mission is to foster enthusiastic interest and active participation in the discovery, documentation, and preservation of cultural resources (prehistoric and historic properties) of the city of Houston, the Houston metropolitan area, and the Upper Texas Gulf Coast Region.

The Houston Archeological Society holds monthly membership meetings with invited lecturers who speak on various topics of archeology and history. All meetings are free and open to the public.

Membership is easy! As a nonprofit organization, membership in the Houston Archeological Society is open to all persons who are interested in the diverse cultural history of Houston and surrounding areas, as well as the unique cultural heritage of the Upper Texas Gulf Coast Region. To become a member, you must agree with the mission and ethics set forth by the Society, pay annual dues and sign a Code of Ethics agreement and Release and Waiver of Liability Form.

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## THE ANDY KYLE ARCHEOLOGICAL COLLECTION PROJECT HISTORY AND WORK

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*Linda C. Gorski and Wilson W. Crook, III*

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### Introduction

The Andy Kyle Archeological Collection was an important public outreach project undertaken by the Houston Archeological Society (HAS) at the Sam Houston Regional Library and Research Center in Liberty, Texas, from February 2017 through August 2017. In the process of renovating its entire museum display, the Sam Houston Regional Library decided to create a new interactive exhibit highlighting the prehistory of the ten county region of Southeast Texas that it serves. At the center of new display is the extensive Andy Kyle Archeological Collection which had been given to the Library by the late Mr. Kyle, a long-time resident of Liberty County, avid avocational archeologist, and supporter of the Center. The HAS was called in to assess the magnitude and importance of the Kyle Collection, at the request of the Texas Historical Commission. Members of the HAS spent three months going through over 40 large framed boards of mounted projectile points and dozens of boxes containing other lithic artifacts, debitage and ceramic sherds. Every artifact in this monumental collection was viewed and assessed regarding its quality and importance to be included in the new exhibit. Diagnostic artifacts of each archeological period represented in the collection were assembled, identified and catalogued for use in the new exhibit. A number of hitherto unrecorded discoveries were made during this process which will be the subject of a several future publications from the HAS. Given the importance of the collection relative to Southeast Texas archeology and prehistory, it was decided to highlight the collection in a Special Report of the Society which is contained in this volume.

### The Sam Houston Regional Library and Research Center

The Sam Houston Regional Library and Research Center is a part of the Archives and Information Services Division within the Texas State Library and Archives Commission. The Center serves as the

official regional historical resource depository for ten counties in Southeast Texas including Chambers, Hardin, Jasper, Jefferson, Liberty, Newton, Orange, Polk, San Jacinto and Tyler Counties. The primary mission of the Center is to collect, curate, preserve, and provide public access to historically significant State and local government materials from the above ten county region. It also serves as a library of both Texana and genealogical resources. Through its historical buildings and educational exhibits, the Center also honors the service of distinguished citizens of the Atascosito District.

The Center was established in 1973 due to the generosity of former Texas Governor Price Daniel and his wife Jean who donated 117 acres of land to the Texas State Library and Archives Commission for the construction of a regional historical repository. An additional 10 acres of land was donated by the Price family in 1985 to create the current 127 acre complex. Local and State-wide fundraising was organized by a number of local groups including the Board of regents of Lamar University. Construction on the Center was started in 1975 and the building was dedicated on May 14, 1977 (Figure 1). The current facility contains 17, 600 square feet which is divided into exhibit areas, the archive, the library, a large meeting room and offices. Its holdings contain over 12,000 cubic feet of records, manuscripts, books, maps and microfilm. Notable collections include the papers of Price Daniel (Texas Governor, U.S. Senator and State Attorney General), the papers of Congressman Martin Dies, and the purported journal of the infamous pirate Jean Lafitte. The Center takes its name from Texas war hero, General, Senator and later Governor, Sam Houston, who was Jean Daniel's great-great grandfather. After Texas' independence, Sam Houston maintained two homes in the area and owned over 20,000 acres in what is today Liberty County.

### The Kyle Collection Archeological Project

As mentioned above, the Sam Houston Regional Library and Research Center is currently in the



*Figure 1. The Sam Houston Regional Library and Research Center located on FM1011 two miles north of Liberty, Texas.*

process of renovating its museum display with one of the objectives being to better utilize the extensive Andy Kyle Archeological Collection. The Kyle Collection comprises well over 30,000 artifacts from 95 archeological sites from nine counties in Southeast Texas. The material collected from these sites represents an area that is essentially between the Trinity and Sabine Rivers. The collection also contains artifacts which are characteristic of Southwest Louisiana as well as Southeast Texas.

In the mid-1980's, the Center commissioned the Houston Archeological Society to make a preliminary assessment of the Kyle Collection. This work included a general identification of the projectile point types present, a listing of the sites and counties represented in the collection, and the registering of all sites then not on file with the Texas Archeological Research Laboratory (TARL) in Austin. A summary of this work was published in *The Journal* of the HAS (Kindall and Patterson 1987). Identification of the projectile point types was hampered by the fact that most of the points were mounted (glued) on wooden boards which were then covered in glass display cases. No projectile points could be directly handled. The numerous boxes of debitage and ceramic artifacts received only a cursory examination.

In January of 2017, members of the Center contacted Brett Cruse and Laura DeNormandie of the Historic Sites Division of the Texas Historical Commission (THC) about help in identifying and selecting diagnostic artifacts from the Kyle Collection for the new prehistory exhibit. Due to the desire to complete the exhibit by the fall of 2017, immediate assistance was needed. The request was forwarded to the

Archeology Division of the THC, which then recommended that the Center contact the Houston Archeological Society for help. Over the course of the next several months, HAS members Wilson "Dub" Crook, Linda Gorski, Bob Sewell, Louis Aulbach, Beth Kennedy and John Lumb spent time going through the entire Kyle Collection, including all pottery and lithic debitage. As part of this work, the Center allowed us to remove artifacts from their mounted cases and additionally clean any glue backing material.

Our key contact during this work was the Manager of the Sam Houston Regional Library and Research Center, Ms. Alana Inman (Figure 2). Alana not only greatly facilitated our work by providing access to the entire collection (even on days when the Center was closed to the public), but also allowed for short-term loans of selective artifacts so we could better study and analyze them using high power microscopes and X-ray Fluorescence technology. The nature of our requests was greatly facilitated by the fact that Ms. Inman had more than a basic understanding of archeology and laboratory techniques, having spent time working on an archeological excavation at Caesarea Philippi in the Holy Land.

Artifacts from the Kyle Collection range in age from early Paleo-Indian (Clovis) to Late Prehistoric, with a few Historic artifacts from the 19<sup>th</sup> Century as well. In discussing the project with Ms. Inman and the outside consultants hired to construct the exhibits, their desire was to set up glass display cases containing diagnostic artifacts from each of the chronological periods represented in the Kyle Collection. The exhibits would contain a series of explanatory descriptions to aid visitors in understanding the types



*Figure 2. Ms. Alana Inman, Manager of the Sam Houston Regional Library and Research Center.*

of artifacts present and their various functions. In addition to these readily visible displays, the Center wanted to create a secondary system of cabinet drawers which could be accessed by visitors in order to see more examples of the various artifacts. Thus our work not only selected and identified key artifacts for the glass displays but also a number of like artifacts which will then populate the additional cabinet drawers. While the majority of the lithic artifacts Mr. Kyle collected were projectile points, we made sure that other utilitarian tools such as cutting and scraping tools, drills, grinding stones and pottery were also present in the display. The Kyle Collection is notable for the large percentage of artifacts constructed from local petrified wood, especially from the Middle Archaic period on. Due to the inherent low quality of petrified wood as a toolstone, many of the artifacts in the collection have undergone extensive heat-treating and thus are characterized by a dull luster and bright yellow, orange and reddish colors.

Visitors to the Center will now be able to see and study the prehistory of Southeast Texas in five basic periods: (1) Paleo-Indian (ca. 13,500-8,000 BP), (2) Early Archaic (8,000-5,000 BP), (3) Middle Archaic

(5,000-3,000 BP), (4) Late Archaic (3,000-1,400 BP), and (5) Late Prehistoric (1,400-500 BP). Moreover, the remainder of the Kyle Collection not on active display will be made available by the Center for future research projects. Some potential areas for further study are highlighted at the end of the following paper.



## THE ANDY KYLE ARCHEOLOGICAL COLLECTION

*Wilson W. Crook, III, Robert J. Sewell, Linda C. Gorski and Louis F. Aulbach*

### Introduction

The Sam Houston Regional Library and Research Center in Liberty, Texas is currently in the process of renovating its entire museum display. A major component of their future exhibits will be the prehistory of Southeast Texas utilizing the extensive Andy Kyle Archeological Collection. This priceless collection of prehistoric artifacts was a gift to the museum by the late Mr. Andy Kyle, long-time resident of Liberty County and avid avocational archeologist (Figure 1).

The collection comprises well over 30,000 artifacts from 95 archeological sites from nine counties in Southeast Texas. These include 36 sites in Liberty County, 21 sites in Polk County, 13 sites in Jasper County, 8 in Sabine County, 7 in Tyler

County, 5 in Hardin County, 3 in Angelina County, 1 in San Augustine County and 1 site in Newton County. The sites present in the collection represent an area that is essentially between the Trinity and Sabine Rivers (Figure 2). As such, they contain artifacts not only characteristic of Southeast Texas archeology but also represent influences from Louisiana as well.

Southeast Texas generally lies in the West Gulf section of the Coastal Plain physiographic Province (Fenneman 1938). The area consists of very low rolling hills of sandy to sandy-clay rich soils that gradually dip toward the Gulf. The surface geology ranges from Eocene (members of the Claiborne and Jackson Groups) to Holocene in age and consists of sandstones, clays, and unconsolidated sandy clays and sands (Sellards et.al. 1932). The nine counties



Figure 1. The late Andrew (“Andy”) James Kyle (1915-2014), noted Southeast Texas avocational archeologist and donor to the Sam Houston Regional Library.

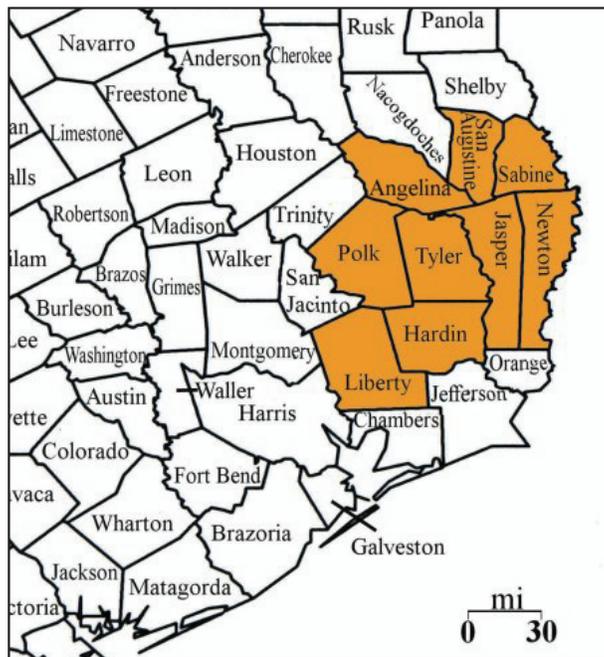


Figure 2. Map of Southeast Texas showing the nine counties (orange) represented in the Andy Kyle Archeological Collection.

included in the Kyle Collection are located on the western edge of the Austroriparian Biotic Province which supports dense forests of pines and hardwoods, both in the river valleys as well as on the uplands (Blair 1950). These woods are composed of several types of oak trees, various predominantly longleaf pines, pecans and sweetgums. Common animals inhabiting the region today include whitetail deer, coyotes, raccoons, opossums, foxes, skunks, squirrels, rabbits, gophers, rats and mice. Numerous species of birds (including Wild Turkey), reptiles and fish also abound, especially in and near the Trinity River. The climate today is considered temperate and average rainfall is between 45-50 inches per year.

Mr. Kyle collected these artifacts from surface sites over the course of his lifetime. Surface collections constitute a large portion of the prehistoric archeological record in much of Texas. Due to erosion and subsequent deflation, or damage from modern construction activities, information from stratified or buried sites is frequently not available. As a result, data from surface collecting is often the only remaining record of prehistoric human occupation. While data from surface collections is less complete than that from excavations of stratified sites, the information gained from surface collections can still yield significant results, especially if the collection is well recorded and the artifacts curated by site as is the case with the Andy Kyle Archeological Collection.

In the mid-1980's, the Center commissioned the Houston Archeological Society (HAS) to make a preliminary assessment of the Kyle Collection which included a general identification of the projectile point types present, a listing of the sites and counties represented in the collection, and the registering of all sites then not on file with the Texas Archeological Research Laboratory (TARL) in Austin. A summary of this work was published in *The Journal* of the HAS (Kindall and Patterson 1987). This effort was hampered somewhat by the fact that most of the projectile points and other key artifacts were mounted (glued) on wooden boards and encased in glass display cases. The artifacts could not be handled to see the reverse face, check for edge grinding, etc. No geochemical tests or reaction to Ultra-Violet (UV) fluorescence was conducted on any of the framed artifacts. Similarly, a cursory examination was made on the numerous boxes of debitage and ceramic artifacts, but a complete check of all materials present was not undertaken.

Recently, the Center again engaged members of the Houston Archeological Society to go through the Kyle Collection and identify and select diagnostic artifacts to be used in the new, interactive exhibit. This process allowed us to remove artifacts from their mounted cases and additionally clean any glue

backing material. During this process, HAS members Wilson "Dub" Crook, Bob Sewell, Linda Gorski, and Louis Aulbach have made a number of discoveries which will help in the understanding of Southeast Texas archeology. In general, many of the sites collected by Mr. Kyle have long occupation sequences, ranging from the Paleoindian period (13,500 years BP) to the Late Prehistoric period (500 years BP). Five major archeological occupational periods are represented in the collection. These include:

Paleoindian	ca. 13,500-8,000 BP
Early Archaic	ca. 8,000-5,000 BP
Middle Archaic	ca. 5,000-3,500 BP
Late Archaic	ca. 3,500-1,400 BP
Late Prehistoric	ca. 1,400-500 BP

The majority of the Andy Kyle Archeological Collection comes from the Late Archaic and Late Prehistoric periods when the aboriginal inhabitants of the region were becoming more sedentary and living for longer periods of time in specific campsites. Prior to this time, the inhabitants of the Southeast Texas region were more nomadic hunter-gatherers, moving from campsite to campsite based on the seasons and food and water availability.

The displays in the Sam Houston Regional Library and Research Center cover each of the above listed five prehistoric time periods with artifacts characteristic of each period highlighted by their type and function. The majority of the artifacts are projectile points but other utilitarian tools such as cutting and scraping tools, drills, grinding stones and pottery are also present. With the exception of pottery, which is made from clay, the artifacts are constructed from various types of silica-rich stone, including chert, jasper, novaculite, quartzite and petrified wood. The collection is notable for the large percentage of artifacts constructed from petrified wood, especially from the Middle Archaic period on. Due to the inherent low quality of petrified wood as a toolstone, many of the artifacts in the collection have undergone extensive heat-treating and thus are characterized by a dull luster and bright yellow, orange and reddish colors.

A summary of the artifacts present in each of the five archeological periods represented in the collection follows.

#### **Paleoindian Period (ca. 13,500-8,000 BP)**

In the initial review of the Andy Kyle Archeological Collection conducted by HAS members in the 1980's, several projectile point types corresponding to the latter part of the Paleoindian



Figure 3. Dalton points from the Knight's Bayou site (41LB61).



Figure 4. Meserve points from Left-to-Right: Easy Side Dam (Liberty County), Ayish Bayou (41SA151), and Wood Springs (41LB15).

period were identified. These included several Meserve points, a single Scottsbluff point, and a number of San Patrice points. In total, 44 Paleoindian points were noted by Kindall and Patterson (1987). They also noted that while looked for, no earlier Paleoindian artifacts (Clovis, Folsom, Dalton) were observed.

Our study of the Kyle Collection revealed the presence of 58 Paleoindian projectile points including two Clovis bases, two Dalton points, three Meserve points, one Scottsbluff point, four Angostura points, 40 San Patrice points, one Pelican point, and five Keithville points. In general with a few exceptions, the majority of the paleo points are constructed from various types of chert, jasper, or other types of high quality toolstone that is not native to Southeast Texas. Several of the points, including the two Clovis bases, the two Dalton points, one Meserve, the four Angostura points, and two San Patrice points,

fluorescence a lemon-yellow to yellow-orange color under UV radiation (short and long wave) suggesting they may be constructed from Edwards chert. If so, this shows long distance contact (200-250 miles) between Central Texas and Southeast Texas. Most of the San Patrice points show no fluorescence under UV light and probably source from a closer region, either East Texas and/or western Louisiana. These projectile points have a dull, waxy luster and show traces of yellow, orange and red coloration indicative of extensive heat-treating of the toolstone prior to knapping. Representative examples of Paleoindian point types present in the collection are shown in Figures 3-8.

In addition to the projectile points, several small "thumbnail" end-scrapers, also characteristic of Paleoindian occupations, were identified. All were made from flakes of high quality chert (likely Edwards chert), show fine retouch on one edge, and



Figure 5. San Patrice points from Easy Side Dam, Liberty County.



Figure 6. San Patrice points from the Wood Springs site (41LB15).



Figure 7. San Patrice points from the Moss Hill site (41LB65).

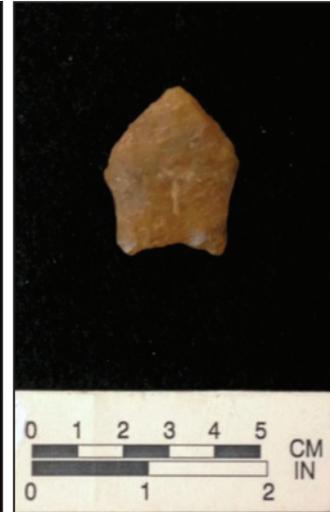


Figure 8. Pelican point from the Wood Springs site (41LB15).

were found at the Wood Springs site (41LB15). A total of eight were identified from the site and five examples are shown in Figure 9. Several larger pieces of gray Edwards chert were worked into side scrapers and are shown in Figure 10.

One of the more spectacular finds by the HAS volunteers has been the broken bases of two fluted projectile points (Figure 11). The two points come from the Wood Springs site (41LB15), which is located only 0.4 of a mile to the south and east of the Sam Houston Regional Library and Research Center. These two points mark the first reported occurrence of Clovis people in Liberty County and push the date for the first occupation of the area back to at least 13,000 years ago (Bever and Meltzer 2007; David Meltzer, personal communication, 2017).

A total of 9 artifacts of probable Clovis affinity were identified from the Kyle Collection at the Wood Springs site. These include the bases of two fluted

points, two large blades, two overshot flakes, two small (<50 mm) prismatic blades, and a side-scraper / perforator made from a broken blade. The artifacts have been studied in detail including physical measurements, high power microscopic examination, and trace element geochemical analysis using X-Ray Fluorescence (XRF). Each artifact is described in detail below.

Both Clovis points are represented by basal fragments, the points having been broken due to fracture (see Figure 11). Comparative measurements versus the State mean as reported in the most recent Texas Clovis Fluted Point Survey of 408 specimens (Bever and Meltzer 2007) are shown in Table 1. In general, point #2 is slightly wider at the base than the State average, but other measurements including width of fluting, thickness of the point at the flute, etc. are in general agreement with the range reported from other Clovis points across the State.



Figure 9. Thumbnail end-scrapers from the Wood Springs site (41LB15).



Figure 10. Side-scrapers made from Edwards chert from the Wood Springs site (41LB15).



Figure 11. Two fluted bases from the Wood Springs site (41LB15).

Examination of both bases by the staff at the Gault School of Archeological Research at Texas State University confirmed that Point #1 was of Clovis manufacture and Point #2 may represent Clovis although its basal thinning technique was more akin to that seen in some western Clovis points.

The first Clovis point is constructed from a brownish-yellow chert (10YR 6/6) (Figures 12 and 13). Prominent fluting scars are present on both faces and the lateral edges of the point are heavily ground from the base up to the point of breakage. The base of the point is only weakly ground. The break appears to be due to a bending fracture rather than from impact which could have occurred either during use or

sometime after its discard. The point fluoresces a dull dark orange color under long-wave UV radiation. The point has a relatively deep basal depth (4.8 mm) but it is within the range of known Clovis points from Texas (Bever and Meltzer 2007). After discovery of this point, all the boxes containing material from the Wood Springs site were thoroughly searched but no other parts of this point or of point #2 were found.

The second fluted point (Figures 14 and 15) is constructed from a gray-colored chert (2.5YR 5/1). Prominent basal thinning is present on both the obverse and reverse faces and the lateral edges and base are heavily ground from the base of the point to the point of breakage. The break appears to be ancient and, like point #1, is from a bending fracture and not from impact. The chert fluoresces a strong yellow-orange color under both short and long-wave UV radiation indicating it is likely made of material from the Edwards Plateau of Central Texas.

While the examination of the many boxes of recovered materials from the Wood Springs site did not reveal any additional Clovis points, several other artifacts of potential Clovis affinity from the site were identified. The first are two blades; one is made from dark greenish-gray chert (GLE Y1 4/1) and is snapped at a distance of roughly 49 mm from the bulb of percussion (Figure 16). Given the width of the blade, its original length could have been in excess of 100 mm. The lack of cortex, coupled with two small flake scars on the dorsal surface, suggests it was an interior blade struck from a prepared core. One lateral edge has been retouched into use as a side scraper. While

**Table 1**  
Comparative Measurements of Wood Springs Clovis Points to State Average  
(Texas Fluted Point Survey, Bever and Meltzer 2007).

Characteristic	Clovis Point 1	Clovis Point 2	State Mean <sup>2</sup>
Maximum Length (mm)	18.5 <sup>1</sup>	16.5 <sup>1</sup>	65
Maximum Width (mm)	25	33.8	28
Width at Base (mm)	22.2	31.9	23.9
Maximum Thickness (mm)	5.5	4.8	7.4
Length of Flute (mm)	0	0	25.2
Ave. Width of Flute (mm)	14.1	17.7	13.5
Max. Thickness of Flute (mm)	3.8	3	5.7
Basal Depth (mm)	4.8	4.1	3.1
Length Basal Grinding (L)	15.0 <sup>1</sup>	11.9 <sup>1</sup>	26.2
Length Basal Grinding (R)	18.5 <sup>1</sup>	16.5 <sup>1</sup>	26.2

<sup>1</sup> Point is broken near the base.

<sup>2</sup> Based on 408 Clovis points recorded in Texas Clovis Fluted Point Survey (2007).



Figure 12. Obverse face, Clovis Point #1, Wood Springs site, Liberty County, Texas.

the blade has affinities with Clovis technology, the small flake scars seen on the dorsal surface are not Clovis-like (Collins 1999; Collins and Lohse 2004; Bradley et al. 2010), thus the artifact may have been picked up and re-used by later people occupying the Wood Springs site (Tom Williams, personal communication, 2017).



Figure 13. Reverse face, Clovis Point #1, Wood Springs site, Liberty County, Texas.

The second blade is complete and appears to be made from a reddish-gray-white material that is similar in coloration to Alibates dolomite (reddish gray (2.5YR6/1) to pinkish gray (7.5 YR6/2) to light brownish-gray (10YR6/2) to reddish brown (2.5 YR5/3). However, both blades fluoresce yellow-orange under UV radiation which suggests an Edwards Plateau origin for the chert (Hofman et al.



Figure 14. Obverse face, Clovis Point #2, Wood Springs site, Liberty County, Texas.



Figure 15. Reverse face, Clovis Point #2, Wood Springs site, Liberty County, Texas.



Figure 16. Blade #1, Wood Springs site, Liberty County, Texas.



Figure 17. Blade #2, Wood Springs site, Liberty County, Texas.

1991; Hillsman 1992) and the mottled coloration on Blade #2 is likely due to heat treating rather than it being Alibates material; Alibates dolomite typically does not strongly fluoresce under UV light (Figure 17). The heat treating appears to be post-creation of the blade and was thus done to possibly aid in affixing the blade to a hafted material.

Measurement of the two blades using the comparative methodology developed by Collins (1999) and Collins and Lohse (2004) for the Gault project are shown in Table 2. These are compared to the mean data from the three complete Clovis blades recovered from the Timber Fawn Clovis site (41HR1165), located 45 km to the west in northeastern Harris County. Because of the breakage in Blade #1, the data cannot be plotted against other Clovis blades. However, Blade #2, when plotted on a triangular configuration diagram, is similar in terms of length, width and thickness ratios to Clovis blades from the Timber Fawn (41HR1165) site, as well as blades from the Gault (41BL323) and Keven Davis (41NV659) sites. This relationship supports the observation that at least Blade #2, and most likely Blade #1 as well, are of Clovis affinity.

Other artifacts of definite Clovis affinity are two overshot flakes (Figures 18-19). The first overshot flake is constructed from a green-gray chert (GLEY1 6/1 – GLEY2 5/1) and is highly fluorescent (deep

yellow-orange) under UV radiation. The flake is 40 mm in length with a prominent bulb of percussion as well as a diving distal edge. The length of the flake is terminated by the presence of cortex along the distal edge. Overshot flakes exhibit characteristic distal curvature that is the result of a plunging termination that removes a portion of the opposite side of a biface (Collins 1990; Collins and Hemmings 2005; Bradley et al. 2011; Waters et al. 2011). While this flake is smaller than most Clovis overshot flakes, its length is likely affected by the presence of the cortex on the edge of the biface – the removal of which appears to have been the purpose of the flake. The second overshot flake is a larger, more classic Clovis biface thinning flake in that it is longer (thus a wider biface), and has a very prominent distal curvature (Figure 19). Length of the flake is 59 mm and it is constructed from a light gray colored chert (10YR 7/1) with prominent white patination on its dorsal surface.

Other potential Clovis artifacts are two relatively small, narrow prismatic blades with relatively small bulbs of percussion and a very low index of curvature. Dimensions of the blades are 45.5 x 13.1 x 4.0 mm and 42.5 x 11.5 x 3.0 mm, in length, width, and thickness, respectively. When viewed from the side, both flakes are almost flat. The dorsal surface of both blades shows a rippling effect from the production of the blade. These features are characteristic of indirect

**Table 2.**  
**Comparative Measurements of Clovis Blades to**  
**Blades from the Timber Fawn site (41HR1165).**

Blade Number	1	2	Timber Fawn Large Blade Mean
Maximum Length (mm)	48.9*	68.3	83.6
Maximum Width (mm)	33.5	22.7	22.6
Max. Thickness (mm)	7.1	6.1	9.3
Platform Angle (°)	111°	113°	112°
Platform Width (mm)	9.1	5.1	6.5
Platform Depth (mm)	5.1	3	3.1
Index of Curvature	N/A	10.2	12
Ratio Length:Width	1.46*	3	3.42
L + W + T (mm)	89.5*	97.1	117
Ratio L/L + W + T	0.55*	0.7	0.71
Ratio W/L + W + T	0.37*	0.23	0.21
Ratio T/L + W + T	0.08*	0.06	0.09
Approximate % Cortex	None	None	N/A
Blade Material	Gray Chert	Reddish-Gray Chert	
Comments	* Blade Snapped	Complete	



Figure 18. Overshot flake #1 recovered from the Wood Springs site, Liberty County, Texas. The bulb of percussion is at the bottom end of the flake.



Figure 19. Overshot flake #2 recovered from the Wood Springs site, Liberty County, Texas. The bulb of percussion is on the right hand side (small end) of the flake.



Figure 20. Small prismatic blade of possible Clovis affinity recovered from the Wood Springs site, Liberty County, Texas.



Figure 21. Second small prismatic blade of possible Clovis affinity recovered from the Wood Springs site, Liberty County, Texas.

percussion, which is not typical of most Clovis blades (Collins 1999; Collins and Lohse 2004; Williams 2014). However, small prismatic blades have been found at the Gault site and other Clovis occupations so their possible affinity to Clovis cannot be ruled out (Tom Williams, personal communication, 2017). Moreover, the distal end of prismatic blade #1 has been reworked into a finely pointed graver, a Clovis trait (Figure 20). The first blade is made of a gray-brown mottled chert (5Y 6/1-2.5Y 5/3-5/4) and fluoresces a strong yellow-orange color under both short and long-waver UV light. This is very similar to the so-called “Gray-Brown-Green Mottled” variety of Edwards chert as described by Dickens (1995) from the Fort Hood Military Reservation in Bell and Coryell counties. The flake has an overall waxy sheen and there are areas of reddish coloration near the distal end that could be signs of heat treatment (see Figure 20). The second flake is a dark greenish-gray chert (GLEY1 4/1) and appears to be made of the same material as Blade #1 described above (Figure 21). It too fluoresces a yellow-orange color under UV light. It should be noted that Mr. Kyle literally collected every piece of debitage from each site he visited. Thus, there are hundreds of flakes in the collection from the Wood Springs site but only two display the prismatic characteristics seen in these two small blades. Therefore, while it cannot be unambiguously

determined that these two artifacts are of Clovis affinity, they are clearly unique, not only in the Wood Springs material but in all the studied lithic material from the entire Kyle collection.

The last tool of possible Clovis affinity from the Wood Springs site is an elongate side scraper which appears to have been made from a blade that subsequently broke during use and was then was re-purposed (Figure 22). The artifact is 70.0 mm in length and 13.4 mm in maximum width. Maximum thickness near the proximal end is 12.0 mm. Examination of the artifact shows that the blade was originally much wider when it was used as an end scraper. This tool then broke during use and subsequent to this break, a fine retouch was done on the left lateral edge. At the same time, the tip of the tool was re-shaped into a perforator. Study of the tip under a Dino-Lite AM4111-T digital microscope at 40-60X shows extensive circular polish on the perforator tip. The artifact is made from a light greenish-gray chert (GLEY1 7/1-8/1) that fluoresces a strong yellow-orange color under UV light.

In addition to the eight chert artifacts of probable Clovis affinity, two small fragments of a proboscidean tooth from either a mastodon (*Mammut sp.*) or a mammoth (*Mammuthus sp.*) were also found in the collections from the Wood Springs site. The larger of the two fragments displays part of a cusp which is



Figure 22. Side-scraper and perforator made from a blade of possible Clovis affinity recovered from the Wood Springs site, Liberty County, Texas.

characteristic of mastodon molars (Figure 23). This larger fragment is extremely polished and may have even been used as a tool.

All nine of the lithic artifacts of probable Clovis affinity are made from high quality chert that is not native to the Southeast Texas area. The artifacts also display a strong yellow to yellow-orange fluorescence under both short and long-wave UV radiation, characteristic of Edwards Plateau chert. Based on these results, it was assumed that the Edwards Plateau was the potential source for the chert in the Wood Springs artifacts. It was therefore decided to analyze each chert artifact for its trace element geochemistry using X-Ray Fluorescence (XRF) technology in order to see if the exact provenance of the chert could be determined. The Sam Houston Regional Library and Research Center graciously gave the author permission to conduct research using XRF technology on the two points, the two blades, the two overshot flakes, the two small prismatic blades, and the side

scraper/perforator to see if the chert used can be sourced to known outcrops in Texas.

Historically, archeologists have been challenged in sourcing chert due to the combination of the mineral's microcrystalline character, the destructive nature of many geochemical analytical techniques (wet chemistry, X-Ray powder diffraction, Neutron Activation analysis, etc.), and the complex trace element chemistry of cherts (Gauthier et al. 2012). Cherts are cryptocrystalline rocks that frequently contain sub-microscopic minerals that are difficult to determine in polarized light microscopy, even for experienced sedimentary petrographers. UV fluorescence, both short-wave and long-wave, has historically been used to make some preliminary determinations. This is especially true for Edwards chert, which has traditionally been identified by its strong yellow to yellow-orange fluorescence under short-wave and particularly long-wave UV radiation (Hofman et al. 1991; Hillsman 1992). However, other non-Edwards Plateau cherts also fluoresce under UV radiation and thus UV light alone cannot be considered a reliable tool for absolute chert source identification. Moreover, within the Edwards Plateau, UV light alone cannot distinguish amongst the many individual sources of chert. These facts argue strongly that a geochemical analysis remains the best technique available to archeologists for potentially sourcing cherts.

Within the spectrum of geochemical analytical techniques currently available, the best non-destructive methods are X-Ray Fluorescence (XRF) and Laser Ablation analysis (Laser Ablation Inductively Coupled Plasma Mass Spectroscopy or



Figure 23. Proboscidean tooth fragments recovered from the Wood Springs site, Liberty County, Texas.

LA-ICP-MS). Of these two techniques, the latter requires access to highly specialized equipment typically not available to most archeologists. Thus, XRF would appear to be the ideal choice for non-destructive sourcing. In this regard, archeologists have had considerable success in sourcing obsidians using a basic seven to nine trace element profile (Glasscock et al. 1998; Jenkins et al. 1995; Shackley 2011). However, when the same technique has been applied to the more complex geochemistry present in cherts, XRF analyses have had mixed success (Gautier et al. 2012; Kendall 2010; Luedtke 1978, 1979; Tykot 2004). As a result, Williams and Crook (2013; Crook and Williams 2013) adopted a much larger, multi-element approach based on the techniques for Laser Ablation analysis as developed by Speer (2014).

The nine Wood Springs chert artifacts were subjected to a trace element geochemical analysis using a portable X-Ray Fluorescence spectrometer (pXRF) in order to attempt to determine their provenance. The analyses were conducted using a Bruker Tracer III-SD handheld energy-dispersive X-Ray Fluorescence spectrometer equipped with a rhodium target X-Ray tube and a silicon drift detector with a resolution of ca. 145 eV FWHM (Full Width at Half Maximum) at 100,000 cps over an area of 10 mm<sup>2</sup>. Data was collected using a suite of Bruker pXRF software and processed running Bruker's empirical calibration software add-on. Sample area on each artifact analyzed was carefully selected to specifically avoid any inclusions within the chert and, where possible, only on flat surfaces such as a flake scar to reduce the scattering effects due to surface topography. Analyses were conducted in April, 2017 at the laboratory of the Gault School of Archeological Research (GSAR) located within the Prehistory Project at Texas State University in San Marcos.

All artifacts were measured using operating parameters of 40keV, 36.2µA, using a 0.12 mm aluminum/0.01 mm titanium filter in the X-Ray path, and a 300 second live-count time. Multiple measurements were taken on both the obverse and reverse faces of each artifact and the measurements then averaged for each sample. Peak intensities for K $\alpha$  and L $\alpha$  peaks were measured for a suite of 22 elements including calcium, titanium, chromium, manganese, iron, cobalt, nickel, copper, zinc, arsenic, rubidium, strontium, yttrium, zirconium, niobium, molybdenum, tin, antimony, barium, lead, thorium, and uranium. From these measurements, the peak intensities for each element were calculated as ratios to the Compton peak of rhodium and converted to parts-per-million (ppm).

All the raw data was processed using a multivariate discriminant analysis ("Fishers

Discriminant Analysis") (Fisher 1936; Krzanowski 1977; Friedman 1989; Rencher 1992). This statistical method was utilized as, unlike principle component analysis, it allows data to be analyzed by individual region. By using this type of statistics, a discrete variance in geochemical signatures can be analyzed and compared. A complete table of all raw data collected (in parts-per-million) is presented in Appendix I at the end of this paper.

Provenance analysis of the trace element data collected from the artifacts was conducted using an Edwards Plateau chert data base initially constructed by Williams and Crook (2013) and subsequently augmented by Williams. Based on the results of the XRF analysis, the nine chert artifacts from the Wood Springs site could not be unambiguously sourced to any specific Edwards Plateau cherts within the current database. This leaves two possibilities: (1) all nine of the chert artifacts from the Wood Springs site were made from non-Edwards chert, or (2) the current small database used at the GSAR does not reflect the many different cherts and their geochemistry that occur all across the Edwards Plateau. Examination of the measurements of the Wood Springs artifacts in Appendix I shows that they share a very similar trace element geochemistry, especially for elements such as cobalt, nickel, copper, zinc, arsenic, rubidium, strontium, yttrium, zirconium, niobium, molybdenum, tin, antimony, lead, thorium and uranium. Based on this high degree of similarity, it would seem that many of the artifacts are from cherts from the same general location. Given the fact that all nine artifacts strongly fluoresce a yellow to yellow-orange color under UV light, something which almost all cherts from East Texas and Louisiana have been found not to do (Hillsman 1992; Williams and Crook 2013), it is likely that they are from the Edwards Plateau, just from areas which are currently not in the GSAR database.

### **Early Archaic Period (ca. 8,000-5,000 BP)**

Much of Texas prehistory falls within a long time span of hunting and gathering cultural pattern known collectively as the Archaic period. The Archaic period in Texas begins around 8,000 BP and is notable for a number of changes in the lithic assemblages of sites, most prominent being the advent of stemmed (not lanceolate) projectile points. Point types (styles) proliferate during the Archaic and there is the introduction of multiple new types of cutting and scraping tools as well as ground stone implements. All of these reflect a gradually increasing population that becomes less and less nomadic and more sedentary over time as they exploited the plant and

animal resources across environments not terribly dissimilar to that of today.

The details of the Archaic occupation vary from region to region across Texas but can be generally broken up into at least three distinct sub-periods or phases usually on the basis of the occurrence of distinctive projectile point types. These include the Early Archaic, the Middle Archaic and the Late Archaic. The latter is sometimes additionally divided into a phase known as the Transitional Archaic to reflect the extensive changes that led to the Late Prehistoric period. Of all these, the Early Archaic is by far the poorest defined and seems to have been the most spread out with loose ties between regions.

The Early Archaic is sparsely represented in the Andy Kyle Archeological Collection. A total of 9 sites out of the 95 in the collection (9 percent) were found to contain at least some diagnostic Early Archaic material. These include five sites in Liberty County (Wood Springs – 41LB15, Knight’s Bayou – 41LB61, Moss Hill – 41LB65, Clark – 41LB71, and Long King Creek – 41LB175), one site in Polk County (Mill Creek – 41PK172), one site in Jasper County (Sheffield Ferry – 41JP31), one site in San Augustine County (Ayish Bayou – 41SA151), and one site in Sabine County (Brookeland – 41SB73). Of these, Ayish Bayou only had two Bell points and the collection from the Brookeland site only had five Dallas points; Sheffield Ferry and Mill Creek only had Bulverde points. None of the other features of the Carrollton Phase Archaic were present in the artifact assemblage from these four sites. Thus, only the sites in Liberty County had more complete suites of Carrollton Phase materials.

While individual sites may or may not contain all the elements associated with the Carrollton Phase Archaic, when taken collectively, such as studying a large assemblage like the Andy Kyle Archeological Collection, a composite pattern can clearly be delineated. In the Andy Kyle Archeological Collection, the Early Archaic is marked by a number of distinctive lithic traits including the following:

- Stemmed dart points (Carrollton, Trinity, Dallas, Big Sandy, Bell, Bulverde and Wheeler Leaf)
- Large leaf-shaped bifaces / knives
- Concavo-convex side-scrapers
- Flake side-scrapers
- Unifacial Clear Fork gouges
- “Waco” net sinkers
- Gravers, typically made on flakes
- Hammerstones
- Fired clayballs
- Red ochre

The above collection of traits are diagnostic of the Carrollton Phase of the Early Archaic as originally described by Crook (1952), Crook and Harris (1952, 1953, 1954, 1955), and Crook (2007c, 2008a, 2008b) from sites in the Upper Trinity watershed in Denton, Dallas and Kaufman Counties. Later discoveries by Crook (2007a, 2007b) expanded the range of the Carrollton Phase Archaic to also include sites along the East Fork of the Trinity River and its tributaries in Collin County. Patterson (1982, 1983, 1991, 2001), McClure and Patterson (1988) and Patterson and Huggins (1987) described parts of the Carrollton Phase Archaic from a number of sites (41HR185, 41HR290, 41HR571, 41FB37 and others) in Southeast Texas along the Trinity River drainage and elsewhere including Harris, Fort Bend, Wharton, Austin, Gaines, Washington, Liberty, Polk, and Tyler Counties. While individual sites may or may not contain all the above listed traits associated with the Carrollton Phase Archaic, when taken collectively, such as studying a large assemblage like the Andy Kyle Archeological Collection, a composite pattern can clearly be delineated.

In the Upper Trinity watershed, Crook and Harris (1952, 1954) found that dart points from the Early Archaic tend to be larger (>50 mm on average) and constructed from a higher percentage (approximately 60-70 percent) of chert as compared to later Archaic periods. Lower quality local toolstones, such as quartzite and petrified wood, tended to be used more in the construction of utilitarian tools (scrapers, gouges, net sinkers, etc.) whereas chert is preferentially used in the manufacture of projectile points. The same observation can be made for the Carrollton Archaic in Southeast Texas as chert comprises 67 percent of the total lithic tool assemblage and 69 percent of the dart points.

Much of the chert used in the construction of Early Archaic dart points in the Kyle Collection fluoresces a strong yellow-orange color under UV light and is thought to have originated from the Edwards Plateau in Central Texas. UV fluorescence, both short-wave and long-wave, has long been used to make some preliminary source determinations for chert. This is especially true for Edwards chert, which has traditionally been identified by its strong lemon-yellow to yellow-orange fluorescence under short-wave and particularly long-wave UV radiation (Hofman et al. 1991; Hillsman 1992). The correlation between UV fluorescence and chert source has been borne out in some Clovis contexts where highly fluorescent cherts have been shown via trace element geochemistry to have originated from the Edwards Plateau (Williams and Crook 2013; Crook 2013; Crook et al. 2016).



Figure 24. Carrollton dart points from Left-to-Right: Moss Hill (41LB65) (4), Wood Springs (41LB15) (2).

While the preferential use of chert for dart points is seen in the Southeast Texas material, the observation that Early Archaic dart points tend to be slightly longer than those from later periods cannot be supported by the artifacts in the Kyle Collection. In fact, the average length for all the Carrollton Phase dart points is about 45 mm, with only Trinity (51.7 mm) and Bulverde (56.9 mm) points averaging greater than 50 mm. The reason for this difference between Southeast Texas and the Upper Trinity watershed appears to be due to the availability of high quality chert which seems to be a much rarer commodity in the sites represented in the Kyle Collection. While a local source of high quality chert was not readily available to aboriginal inhabitants of the Upper Trinity, they appear to have had a stronger regional link to Central Texas where Edwards chert could be obtained. The lack of regular access to Edwards chert for the Early Archaic inhabitants of Southeast Texas is supported by the fact that almost every dart point in the collection has been broken and resharpened at least once and some apparently several times. Additionally, almost every piece of chert debitage in the collection has been re-used to make expedient tools such as small flake side-scrapers, graters and the like.

The Carrollton Phase Archaic is distinguished by two distinctive dart point types, the Carrollton and Trinity (Figures 24-25). Carrollton points are “Christmas tree” shaped with a triangular blade and rectangular stems. Barbs, such as are seen on Bulverde points, are generally absent. Edge grinding to facilitate hafting can be found on the lateral edges of the stem on all true Carrollton points. This is a key diagnostic feature and distinguishes Carrollton points from other similar shaped dart points such as Bulverde and Dawson.

Blades on non-resharpened points are broad, much more so than seen on Dawson or other triangular-shaped point types. This broad outline diminishes with use and resharpening. As can be seen in Figure 24, almost all of the 13 Carrollton points present in the Andy Kyle Collection are constructed from chert and are relatively small (average length = 41.1 mm), having been resharpened extensively with use. This is a common characteristic of areas where high quality cherts are not common and the aboriginal inhabitants wish to extend the life of the point for as long as possible.

Trinity points (Figure 25) are a medium-sized to small (with use and resharpening) dart point that is generally sub-triangular in outline. The blade is

Figure 25. Trinity dart points from Left-to-Right: Moss Hill (41LB65) (2), Wood Springs site (41LB15) (2), Knight's Bayou (41LB61) (3).



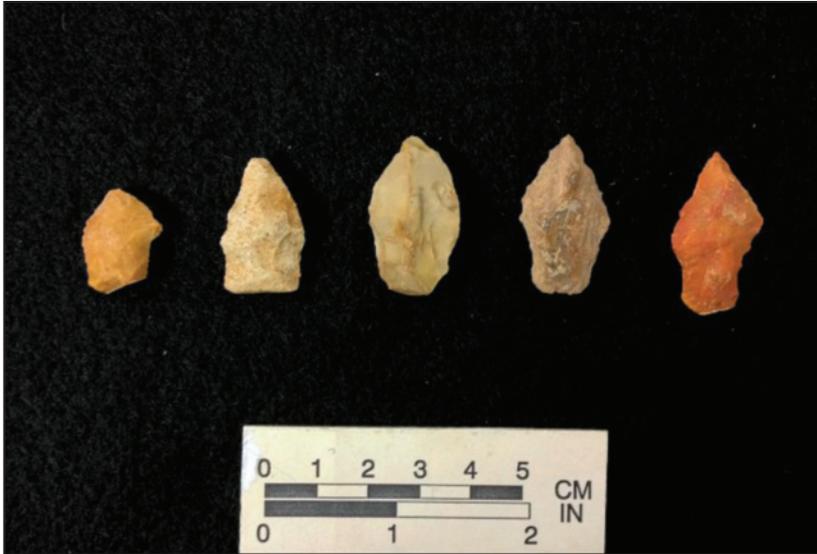


Figure 26. Dallas dart points from the Brookeland site (41SB73).

triangular with weak shoulders forming shallow notches. In all true Trinity points the notches have been ground smooth to facilitate hafting. The base is prominently convex and can occasionally also be ground. The edge grinding in the notches is what distinguishes this point from other similar dart point types such as Godley and Ellis. Trinity points are relatively thick and crudely chipped and are larger than similarly-shaped Elam points. Size of the point is usually well in excess of 50 mm in length (Kyle Collection average = 51.7 mm) but does decrease with use and resharpening (see Figure 25).

Other Early Archaic dart point forms present in the Andy Kyle Archeological Collection include Dallas, Big Sandy, Bell and Bulverde points. Jelks (2017) found abundant Woden dart points in the Early Archaic assemblages of sites in and around Sam Rayburn Reservoir. Woden points are very crudely manufactured and come in a variety of forms (Turner

and Hester 1985, 1993, 1999). They are most readily recognized by the presence of a flat, unworked base at the end of a rectangular or semi-rectangular stem. No similar points were readily identified from the Kyle Collection although the difficulty in shaping projectile points from petrified wood (a primary material for Woden points) makes absolute point type identification for many of the points in the collection difficult to impossible.

Dallas points are a small to medium-sized dart point that is generally pentagonal in outline (they were originally described by Crook and Harris (1952, 1954) as “Dallas Pentagonal” points but the name has been shortened to just Dallas by Suhm et al. (1954) and Suhm and Jelks (1962). The blade is triangular with weak shoulders. The stem tapers slightly to a straight to slightly concave base thus creating an overall pentagonal shape. Edge grinding to facilitate hafting is present on the stems of some but not all specimens.



Figure 27. Big Sandy dart points from the Knight's Bayou site (41LB61).



Figure 28. Resharpened Bell points from the Ayish Bayou site (41SA151).

Dallas points are relatively thick and crudely chipped (Figure 26).

Big Sandy points are generally triangular in outline with distinctive small side notches near the base of the point (Figure 27). As can be seen in the figure, the examples in the Andy Kyle Collection are made from high quality chert and tend to be fairly small, having been re-worked after breakage in an attempt to extend the effective life of the point. Two examples of probable Bell points were observed in the collection. Bell points, like Andice and Calf Creek types, have prominent barbs with deep notches adjacent to a rectangular stem. The barbs are frequently broken and resharpened with use and, as a result, they seldom resemble their origin design shape (Figure 28). Bulverde points tend to be medium to large, with a triangular blade and prominent

shoulders. The shoulders end in barb which distinguishes them from similarly-shaped Carrollton points. The stem is rectangular but unlike Carrollton points, is never ground. Bulverde points are usually thicker than other similar points (Carrollton, Dawson). While primarily a Central Texas point, Bulverde points have been found in North Central Texas, in East Texas, and now along the Trinity River drainage system in Southeast Texas (Figure 29).

Another component of the projectile point assemblage was a leaf-shaped point which Crook and Harris called the “Wheeler Leaf” point, named for the site of its original discovery and one of the two type sites for the Carrollton Phase Archaic. Wheeler Leaf points have now been recognized from at least 15 sites across four counties in the Upper Trinity River watershed. While other point types described by Crook and Harris, such as the Trinity, Dallas and Elam points, were subsequently recognized as valid point types and have been further characterized over the years (Suhm et al. 1954; Suhm and Jelks 1962; Turner and Hester 1985, 1993, 1999; and Turner et al. 2011), no complete description of the Wheeler Leaf point was ever made.

Wheeler Leaf points are a medium-sized dart point that is leaf-shaped in general outline. The blade is prominently triangular with an ovoid stem. Shoulders and barbs are completely absent. No edge grinding on the stem is present. The point is typically thick and crudely made, but some thinner, better made examples are known. No evidence of edge retouch is present on any of the observed specimens with the points apparently having been constructed solely from hard hammer percussion. Examples of typical Wheeler Leaf points from the Kyle Collection are shown in Figure 30.

Wheeler Leaf points resemble many forms of ovoid to leaf-shaped bifacial cutting tools including



Figure 29. Bulverde dart points from the Sheffield Ferry site (41JP31).



Figure 30. Wheeler Leaf points from the Moss Hill site (41LB65) (3) and Wood Springs (41LB15) (3).

knives. However, extensive examination of all the type specimens from the Upper Trinity watershed and those in the Kyle Collection under both a traditional binocular microscope (20x) and a high power Dino-Lite Am-411T microscope (20-200x) failed to reveal any wear patterns consistent with their use as knives. Beveling, either two or four edged, is absent which further sets Wheeler Leaf points apart from bifacial knives. Conversely, a number of the artifacts observed from both areas have prominent distal end impact fractures which are consistent with their use as projectile points.

Other Early Archaic artifacts observed in the Kyle Collection include large square-based to ovoid bifaces, probably used as knives (Figure 31), concavo-convex side-scrapers, small scrapers made from flakes (Figure 32), Clear Fork type unifacial gouges (Figure 33), Waco net sinkers (Figure 34), multi-point graters made from chert flakes (Figure 35), hammerstones

made from quartzite cobbles (Figure 36), and fired clayballs (Figure 37). The latter are believed to either be linings of fire hearths or material which was purposefully shaped, heated in a fire and then dropped into a mud-lined basket or stomach lining bag in order to indirectly heat its contents. Patterson (1986; 1989) has recorded the presence of abundant clayballs in a number of Early Archaic sites in southeast Texas. He postulated that they were used for seasonal specialized food processing and/or heat treating siliceous lithic material. Hudgins (1993) has demonstrated experimentally that clay balls retain heat significantly longer than wood coals and can be effectively used to roast plant food materials or meat without the need for ceramics.

Like many Archaic dart points in Texas, Carrollton, Trinity and Dallas points have not been precisely dated. Crook (1959) reported a date for the upper part of the Carrollton Phase occupation as ca.



Figure 31. Large biface / knives from the Clark site (41LB71) left and Long King Creek (41PK175) right.



Figure 32. Typical Early Archaic scrapers from Knight's Bayou (41LB61). From left to right: concavo-convex side scraper, flake side scraper, end-scraper, side scraper.



Figure 33. Unifacial Clear Fork gouges from Wood Springs (41LB15) (left) and Moss Hill (41LB65) (right two).



Figure 34. Large quartzite net sinker from the Moss Hill site (41LB65).

6,000 BP based on a single radiocarbon date from the Wood Pit (41DL76) in Dallas County. The majority of the Carrollton Phase including Carrollton points were found as much as 75 cm below the level where the radiocarbon date was obtained. Thus the 6,000 BP date should be seen as an absolute minimum date for the point with its origins being significantly older, possibly as old as 8,000 BP. In Southeast Texas, Patterson (1991) estimated the age of Carrollton points to be approximately 7,000 BP. In this regard, the proposed projectile point sequence of Prikryl (1990) should be modified to reflect this significantly older occurrence.

**Middle Archaic Period (ca. 5,000-3,500 BP)**

Around 5,000 years ago, there appears to have been a climate change towards wetter and milder conditions. With milder weather, food resources became more plentiful and accordingly, the populations of Archaic people in Texas expanded (Turner and Hester 1985, 1993, 1999). This change marks the beginning of the Middle Archaic period. In Southeast Texas, the Middle Archaic period lasts from about 5,000 years ago to about 3,500 years ago (ca. 3,000 B.C. to 1,500 B.C.).

The Middle Archaic people have a very similar lifestyle to that of the Early Archaic period. The people are still primarily nomadic hunter-gatherers but their campsites have become larger which has generally been attributed to a more sedentary lifestyle. There is still seasonal movement, but depending on the resources of



Figure 35. Multi-point graver on chert flake from the Moss Hill site (41LB65).



Figure 36. Quartzite hammerstone from the Wood Springs site (41LB15). Note the fracture damage on the left end which ultimately led to its discard.



Figure 37. Fired clayballs from the Moss Hill site (41LB65).

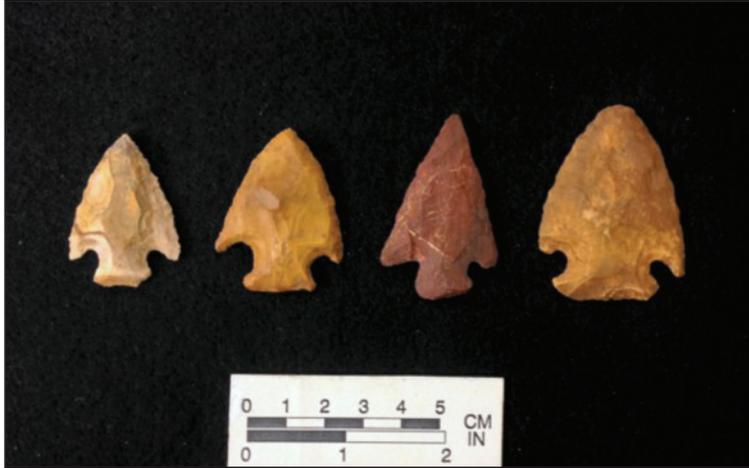


Figure 38. Williams dart points from the Moss Hill site (41LB65). Note the coloration on the chert from extensive heat-treating of the toolstone prior to knapping



Figure 39. Pedernales dart points from the Moss Hill site (41LB65).

the region, this movement could have been accomplished by smaller hunting bands which then brought food back to a main living camp. As you would expect from campsites that are occupied for longer periods of time, there is a greater density of artifacts from Middle Archaic sites than seen in those from previous periods. This is reflected in the Andy Kyle Archeological Collection where the majority of the artifacts stem from the Middle Archaic and later periods.

The atlatl spear thrower and the dart remain the principal hunting weapon, but again there are subtle differences in the way the dart points were manufactured. During the Middle Archaic, dart points tend to be slightly smaller and there is an increase in the number of types or style of points made. Moreover, there is an increasing utilization of local toolstone (quartzite and petrified wood) although high

quality chert is present, especially in dart points which are more common to Central Texas such as in Pedernales points. In the Kyle Collection, typical Middle Archaic dart point types include Williams, Pedernales, Gary and Elam. The Gary point is one of the most common dart points in Texas archeology and ranges in time from the Middle Archaic into the Late Prehistoric in some parts of Texas (Crook and Hughston 2015). Typically those which have been found in Middle Archaic contexts tend to be quite larger, often exceeding 65-70 mm in length. There are also a number of the unusual double-notched Evans points in the collection which indicates contact and influence from across the Sabine River in Louisiana where the point type originates. Examples of all of the Middle Archaic dart point types are shown in Figures 38-41 below.



Figure 40. Large Gary dart points from Left-to-Right: Moss Hill (41LB65) (2) and East Tempe (41PK66) (3). Note the evidence of heat treating, especially on the distal end of the point on the far right.



Figure 41. Distinctive double notched Evans dart points from the Sheffield Ferry site (41JP31).

Other artifacts associated with Middle Archaic occupations include large scrapers, knives and other tools associated with the butchering and processing of wild game (Figures 42-44). Many of the scrapers are circular in outline and resemble so-called “Bristol Bifaces” (see Figure 44). The Middle Archaic inhabitants lived on a diet of whitetail deer,

supplemented with smaller game, fish, shellfish and nuts, berries and wild edible seeds. Small grinding stones or “manos” are also found in Middle Archaic campsites (Figure 45). These were not used for grinding grains such as corn, as these had yet to be cultivated and introduced into Southeast Texas. Instead, they appear to have been used in the grinding



Figure 42. Large bifacial knives from the Goodrich site (41PK182).



Figure 43. Curved side-scraper made from petrified wood from the Knight's Bayou site (41LB61).



Figure 44. Small circular scrapers from the Moss Hill site (41LB65).

of edible wild seeds, nuts into a paste-like meal, and also for powdering pigments such as red and yellow ochre – a naturally occurring clay-like iron oxide. We do not know precisely what these pigments were used for but possible uses include clothing coloration or special functions associated with spiritual beliefs.

Another tool found in the Middle Archaic artifact assemblage in the Kyle Collection are so-called “nutting stones”. These are typically made from

sandstone and shaped into a rough, rectangular block shape, usually 8-15 cm (3-6 inches) on a side. The stones have small depressions worn into the upper surface which has been ascribed to holding a large nut, such as a walnut, while it was cracked (thus the term “nutting” stone). It is not unusual to find a corresponding depression on the opposite side as one hole becomes too deep for effective use. However, one such stone in the Kyle Collection from the Moss



Figure 45. Small one-hand grinding stone made from sandstone, Dam B site (41TL32).



Figure 46. Sandstone Nutting stone with multiple depressions from the Savoy site (41LB27).

Hill site (41LB65) not only had two depressions, but every single side of the artifact had been used with a total of six depressions (Figure 46).

While chert is still a common material in the artifacts of the Middle Archaic, there is a much greater percentage of local toolstone including petrified wood and quartzite present. As much of this local material is of poorer flaking quality, the indigenous inhabitants of Southeast Texas had to heat this stone prior to construction of the artifact. This accounts for much of the reddish and yellow colors present on many of the artifacts.

**Late Archaic Period (ca. 3,500-1,400 BP)**

Beginning around 3,500 years ago, there appears to have been another major cultural change with the Archaic populations across Texas becoming even more sedentary. Towards the end of this period,

around the time of the Birth of Christ, there appears to have been a major influx of new technologies and possibly new peoples into the region. The Archaic lifestyle begins to disappear and larger, more permanent occupations sprout up all across the state. As a result, the Late Archaic period is often subdivided into the Terminal Archaic or Transitional Archaic., the latter term reflecting the major changes leading into the next major cultural phase, the Late Prehistoric. The Late or Transitional Archaic period lasts from about 3,500 years ago to about 1,400 years ago (ca. 1,500 B.C. to 600 A.D.).

The Late Archaic people still live primarily by hunting and gathering, but their campsites become larger and are occupied for greater periods of time during the year. Seasonal movement becomes more restrictive, not only because of the difficulties associated with moving larger groups of people but also because of the potential for territorial conflict



Figure 47. Gary dart points from the Long King Creek site (41PK175).

Figure 48. Yarbrough dart points from the Randolph site, Liberty County (2) and from Brookeland (41SB73) (3).





Figure 49. Ellis dart points from the Moss Hill site (41LB65) (2) and from Bledsoe Creek, Liberty County (3).



Figure 50. Kent dart points from the Moss Hill site (41LB65) (2) and from the Kennific site, Liberty County (3).



Figure 51. Dawson dart points from the Moss Hill site (41LB65) and from Yellow Bayou, Newton County (3).



Figure 52. Darl dart points from the Mill Creek site (41PK172).



Figure 53. Motley point from the Moss Hill site (41LB65).



Figure 54. Pontchartrain point from the Moss Hill site (41LB65).



Figure 55. Resharpended Gary dart points into hafted end-scrapers, West Trinity (41LB69).

with other bands of people. The Andy Kyle Archeological Collection reflects this more permanent occupation in Southeast Texas as the majority of the artifacts in the collection come from the Late Archaic and Late Prehistoric periods.

The atlatl spear thrower and the dart remain the principal hunting weapon, but there is an even greater proliferation in the style and types of dart points being utilized. The size of the point also continues to diminish. Typical Late Archaic dart point types include Gary, Yarbrough, Ellis, Ensor, Kent, Dawson, Darl, and Edgewood. By far the single most common dart point type present in the Gary. Most examples are smaller than those found in the Middle Archaic

(typically less than 50mm in length) and are primarily constructed from local, heat treated quartzite. There is continued influence from east of the Sabine River which can be seen by the occasional occurrence of Motley and Pontchartrain points, both native to Louisiana. Representative examples of the various Middle Archaic dart point types can be seen in Figures 47-54.

A characteristic trait of the Late Archaic is the re-use of damaged Gary dart points by resharpener the broken distal end into a fan-shaped, hafted end-scrapers (Figure 55). Other artifacts associated with Late Archaic occupations are similar to previous Archaic periods and include scrapers, knives, drills



Figure 56. Large, ovoid-shaped bifaces the Pine Island Bayou site (41HN11) (2), the Ace site (41PK36) (1), and from the Copeland site (41PK187) (2).



Figure 57. Small, circular scrapers from the Knight's Bayou site (41LB61).

and other tools associated with the butchering and processing of wild game (Figures 56-57). The Late Archaic diet is believed to have been similar to that of the Middle Archaic including the grinding of edible wild seeds, nuts into a paste-like meal, and also for powdering pigments. Soups and stews are believed to have been common meal items.

Almost all of the artifacts from the Late Archaic period are made from local toolstones, collected as cobbles in the riverbeds such as the Trinity River. Petrified wood is the most common toolstone, the majority of which has been subjected to heat treating prior to flaking

#### **Late Prehistoric Period (ca. 1,400-500 BP)**

Toward the end of the Archaic, several major new technological developments were introduced into prehistoric Texas. The first of these is the introduction of pottery which provided the inhabitants with a stable cooking and food transportation system. Prior to the invention of pottery, the Archaic peoples used baskets, typically lined with mud or clay, or bags made from animal's stomach lining in order to hold fluid contents. As a basket or stomach bag cannot be set directly onto the fire, food was prepared by first heating and then dropping either stones or clayballs into the basket in order to indirectly heat its contents. However, with the advent of pottery, food could now be directly prepared over the fire. Most of the pottery

in the Kyle Collection is of local manufacture and of types known as Goose Creek Plain, Goose Creek Incised, Baytown Plain or San Jacinto Incised. However, some pottery of East Texas ancestral Caddo manufacture is also present and is probably present as the result of trade.

The second major innovation during the Late Prehistoric period was the adoption of a new weapons system, the bow and arrow. The bow was a more accurate mechanism of shooting a projectile at a prey animal and could fire more rapidly than the atlatl and dart. However, until the widespread use of bois d'arc wood bows, which were native only to extreme Northeast Texas, the bow lacked the penetrating power of the atlatl. So in many places across Texas, a dual weapons system was maintained at least up until about 900-1,000 A.D (Tomka 2013; Crook and Hughston 2015).

The third new innovation was the introduction of cultivated grains such as maize (corn). While not immediately prevalent across all of Texas, maize agriculture gradually became more and more widespread. With the advent of grain crops, the people now had a ready source of food that could be planted, harvested, and stored for use throughout the year. This innovation, more than anything else, helped end the Archaic lifestyle as people now became permanently located in villages. The Late Prehistoric period in Southeast Texas begins around 1,400 years ago and



Figure 58. Alba arrow points from Easy Side Dam, Liberty County (Top Row) and Bledsoe Creek, Liberty County (Bottom Row).

lasts until the coming of Europeans to Texas about 500 years ago (ca. 600 A.D. to 1500 A.D.).

Common artifacts seen in the Kyle Collection from the Late Prehistoric period include numerous small arrow points and pottery sherds. Typical arrow point types include Alba, Catahoula and Perdiz (Figures 58-60). The influence from east of the Sabine River continues in the occurrence of the unique Friley arrow point. Friley points are easily recognized as they are the only arrow point type in Texas with

upward turning barbs (Figure 61). As can be seen in the figures below, the arrow points in the Kyle Collection are constructed from a wide range of lithic materials, including chert, jasper, novaculite, quartzite and petrified wood – virtually all of which has been heat treated prior to knapping. With respect to the chert arrow points, only a few show any fluorescence under UV light. There is also a predominance of colored chert (reds, yellow, orange, brown) which is also not typical of Central Texas Edwards Plateau



Figure 59. Catahoula arrow points from Knight's Bayou (41LB61) (Top Row) and Moss Hill (41LB65) (Bottom Row).



*Figure 60. Perdiz arrow points from Moss Hill (41LB65).*

cherts. It is unknown where the source of these cherts is but it is likely that they come from river cobbles in deep East Texas and western Louisiana.

It is significant to note that we could not find any Scallorn points in the collection. Kindall and Patterson (1986) reported four Scallorn points and a single Bonham point in their review of the collection in the 1980's, but we could not find any matching those two point types. Similarly, in his study of 13 sites around Sam Rayburn Reservoir, Jelks (2017) did not report a similar Scallorn point out of 311 arrow points recovered. As Scallorn points are one of the most common and abundant arrow point types in

Texas, with a distribution that covers virtually the entire state, it is unknown why this point type is not reflected in the 95 sites covered by the Kyle Collection. Since it was also not found immediately to the north around Sam Rayburn Reservoir, it must be concluded that Scallorn points had a more western distribution.

A second observation regarding the arrow point assemblage is that there are no triangular arrow points, either simple triangles (Fresno) or side-notched (Washita, Harrell). Triangular arrow points are common to the Southern Great Plains after about 1300 A.D. and are generally associated with

*Figure 61. Friley arrow points from the Yellow Bayou site, Newton County. Note the unique upward turn to the barbs on all the examples.*





Figure 62. Harahey four-beveled knife from the Knight's Bayou site (41LB61).



Figure 63. Mineola Bifaces from the Moss Hill site (41LB65).

aboriginal groups hunting bison (Suhm et al. 1954; Suhm and Jelks 1962; Turner and Hester 1985, 1993, 1999; Crook and Hughston 2015). The complete absence of triangular arrow points in the Kyle Collection shows that there was probably very limited if any contact with people from the Southern Great Plains and as such, bison was probably never a part of the diet of the prehistoric inhabitants of southeastern Texas.

Other lithic tools present in the Late Prehistoric component of the Kyle Collection include ovoid bifaces made from quartzite or petrified wood, four-beveled "Harahey" knives (Figure 62), scrapers, large chopping tools known as "Mineola" Bifaces (Figure 63), notches (Figure 64) and drills (Figure 65). The Mineola Biface (sometimes called the "Harvey" Biface) is constructed from flat, thin slabs of petrified

wood which has been sharpened on one end. Occasionally both the distal and proximal end have been sharpened but cortex is usually present on one of more surfaces as well as the proximal (butt) end. These tools are believed to have been either hand-held or hafted chopping tools, and may have been used as adzes in wood working (Turner and Hester 1998). A large number are present in the Kyle Collection as petrified wood accounts for 75+ percent of the lithic tools in the Late Prehistoric period.

A number of notches or "spokeshaves" are present. They are all constructed on flakes of varying size, each with a distinctive concave notch created in order to shape wood or bone such as arrow shafts or bone tools (see Figure 64).

Another unique Late Archaic to Late Prehistoric tool present in small numbers in the Kyle Collection



Figure 64. Notch or "spokeshave" from the Dam B site (41TL32).



Figure 65. Drills made from petrified wood and chert flakes from the Moss Hill site (41LB65).



Figure 66. "Perkin Pike" tool from the Moss Hill site (41LB65).



Figure 67. Circular ornament made from bone from the Moss Hill site (41LB65).

is the so-called "Perkin Pike" (Figure 66). These artifacts are made from small, elongate chert or petrified wood cobbles. The distal end has been bifacially flaked into a pointed blade with the proximal end of the cobble left unmodified. It is uncertain if they functioned as knives, scrapers or small choppers. Four examples from sites in Liberty County were found in the Kyle Collection; three made from chert and one from petrified wood. Length ranges from 55 to 72 mm with widths from 26-34 mm and thickness from 20-25 mm.

Jelks (2017) recorded 121 specimens from 10 sites around the Sam Rayburn Reservoir and coined the term "Perkin Pike" to label this tool type. The term "pike" denoting not a particular function just that the tools had a pointed distal end. Similar artifacts have been recorded from the Addicks Reservoir in Harris County (Wheat 1953), from Texarkana Reservoir (Jelks 1962), and from various sites in San Augustine, Jasper and Angelina Counties (Tunnell 1961; Duffield 1963). They have been variously called choppers, "Type V Blades" and "Perkin Pikes". Their discovery from sites in Liberty County further extends the known range of the tool in Southeast Texas.

During the Late Prehistoric there seems to have been an increase in luxury items such as beads, ornaments and the like. Corresponding to this increasing demand is the occurrence of a number of very finely made drills. Almost all of these tools are made on flakes, the base of which has frequently been retained as a holding platform. The distal ends of these

drills can be quite long, some exceeding 30-40 mm in length, and frequently show a dulling from rotary wear. Drills in the Kyle Collection are made from chert, quartzite and petrified wood. Typical examples of such tools are shown in Figure 65.

Artifacts manufactured with the drills include beads made from stone, shell and bone. Bone and shell preservation is very poor throughout the Kyle Collection but a few examples of each were observed. One particularly impressive piece of ornamentation was a large circular bone pendant from the Moss Hill site (41LB65) (Figure 67). This artifact was found in three pieces and reconstructed by Mr. Kyle.

One intriguing find was the discovery of five sub-triangular bifacial tools which appear to be East Fork Bifaces as described by Crook and Hughston (2007). Three of these tools were found in the collections from the Moss Hill (41LB65) site while the other two are from the Wood Springs (41LB15) site. In Late Prehistoric sites along the East Fork of the Trinity River, Crook and Hughston (2007) found that these small artifacts probably functioned as specialized hafted woodworking tools and were used as adzes. Replication experiments showed that the striations and wear patterns found on the artifacts were likely produced when scraping green bois d'arc wood and thus the tools may have been a specialized tool used in the production of bois d'arc staves for bows (Crook and Hughston 2007, 2015). Bois d'arc is not believed to be native to Southeast Texas and it is unclear what material these artifacts from Liberty

**Table 3. Physical measurements of East Fork Bifaces from the Kyle Collection<sup>1</sup>.**

Biface Measurements	1	2	3	4	5	East Fork Mean <sup>2</sup>
Site	Wood Springs	Wood Springs	Moss Hill	Moss Hill	Moss Hill	
Length (mm)	28.5	29	37.4	40	40.3	42.4
Width (mm)	27.2	25.5	30.9	30	30	34.8
Thickness (mm)	9.1	7.9	12.2	8.4	10.9	13.8
L:W Ratio	1.05	1.14	1.2	1.33	1.39	1.22
Biface Material	Petrified Wood	Petrified Wood	Chert	Quartzite	Petrified Wood	Quartzite
Presence of Cortex	Yes	Yes	Yes	Yes	Yes	Common
Edge Crushing	Yes	Yes	Yes	Yes	Yes	Common
Bit Striations	Yes	No	Yes	Yes	Yes	Common
Hafting Polish	Yes	No	Yes	Yes	Yes	Common

1 Data corresponds to artifacts shown in Figure 68, Left to Right.

2 Based on the average of 165 bifaces.

County might have been used on. Measurements of the five artifacts in terms of length, width, thickness are similar to the East Fork Bifaces from North Central Texas (Table 3). Crook and Hughston (2007) found that the bifaces made along the East Fork and its tributaries were preferentially made from heat-treated quartzite, with only a few tools made from chert. Likewise, three of the five East Fork Bifaces in the Kyle Collection are made from petrified wood,

one is from quartzite, and only one was constructed from chert. The five East Fork Bifaces from the Kyle Collection are shown in Figure 68.

As mentioned above, there isn't a lot of bone material in the Kyle Collection. Given Mr. Kyle's tendency to collect every flake from a site, the lack of bone has to be due to poor preservation in the acidic soils of the region as opposed to selective non-collection by Mr. Kyle. Two highly weathered bone



Figure 68. East Fork Bifaces from the Wood Springs site (41LB15) (2) and the Moss Hill site (41LB65) (3).



Figure 69. Bone awl from the Menard Creek (Duke Lake site) (41LB78).

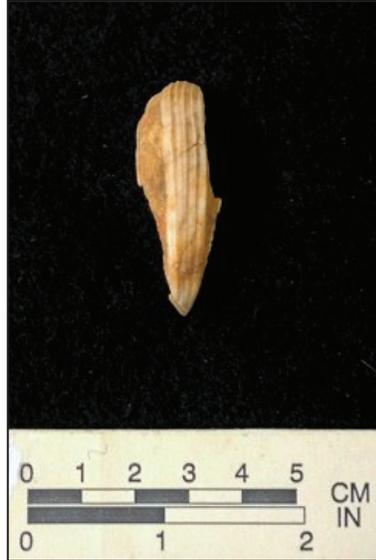


Figure 70. Large beaver incisor from Knight's Bayou site (41LB61).



Figure 71. Bear canine teeth Dam B (41TL32).

tools were found in the collection and the best preserved one is shown in Figure 69. What bone is present in the collection appears to be largely Whitetail Deer, although one large incisor was found from Menard Creek (41LB78) which can only come from a beaver (*Castor canadensis*) (Figure 70). Two large canine teeth, probably black bear (*Ursus americanus*), were also observed (Figure 71). No turtle bones are present in the collection and there are very few pieces of mussel shell.

Other unusual items in the collection include two small pieces of galena (PbS) from the Moss Hill site (41LB65) and three pieces of fossil coral from the

Brookeland site (41SB73). Both pieces of galena are in matrix and must have been obtained as a result of long-distance trade as galena is only known in Texas in very small amounts from the Central Mineral Region (Burnet County) and the matrix rock is very different than present in the collection specimens (Crook and Hughston 2014) (Figure 72). A more likely source is the Tri-State Lead-Zinc District of northeastern Oklahoma-northwestern Arkansas-southern Missouri (Crook and Hughston 2014). The coral fragments appear to be from the Eocene colonial coral *Archochelia* sp., which is a pencil-shaped coral with small calyxes scattered along a sticklike colony



Figure 72. Galena (PbS) in matrix from the Moss Hill site (41LB65).



Figure 73. Fossil coral *Archochelia* sp. from the Brookeland site (41SB73).

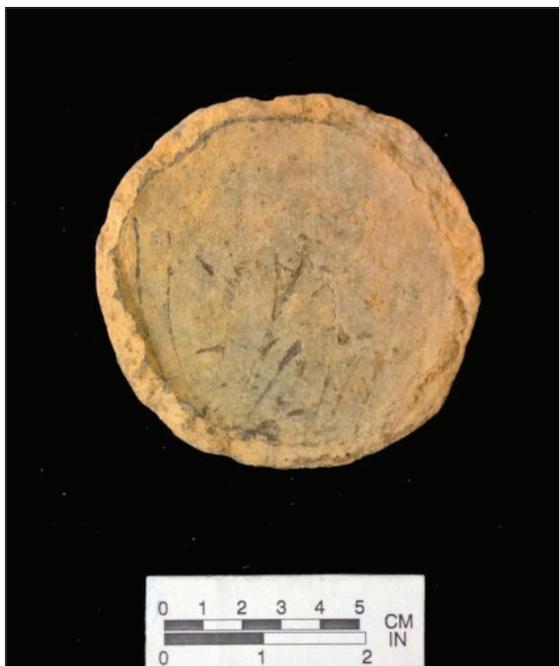


Figure 74. Base of a flat bottomed vessel of unknown plain ware type from the Moss Hill site (41LB65).



Figure 75. Fire mottled pottery sherd, probably Baytown Plain, from the Moss Hill site (41LB65).

(Figure 73). *Archochelia* sp. can be found where Eocene rocks crop out throughout East Texas and was undoubtedly either picked up by the aboriginal inhabitants and/or was traded for as a unique ornament. The discovery and bringing back to campsites of unusual rocks, crystals and/or fossils is a trait commonly found throughout Texas, especially during the Late Prehistoric period (Crook 2014).

One of the signature Late Prehistoric artifacts is pottery and the Kyle Collection literally contains thousands and thousands of ceramic sherds. The ceramic assemblage is primarily composed of undecorated utilitarian cooking ware – flat-bottomed jars and bowls of various sizes. Most of the sherds have been darkened by fire and many still retain greasy residues on their interior surface. While no complete ceramic vessels are present in the collection, there are a number of bases and rim sherds which can be used to approximate both the size and shape of the original vessel. All base sherds are flat; no rounded bases were observed anywhere in the collection (Figure 74). There is no indication of the presence of any exotic vessel shape such as water bottles, effigy vessels and the like.

Almost all of the pottery present in the collection appears to have been made from coils from the base up. Wall thicknesses of the vessels vary a great deal but are always thicker in the main part of the body and the base and thin toward the rim. This suggests that most if not all of the vessel appear to have been built from the base upwards to the rim (Krause 2007).

Temper also vary widely with sand being the most prevalent although some sherds also have a compact clay paste that contains finely-crushed grog (crushed fired clay) as well. Cores of the sherds are almost always darker than the interior or exterior surfaces, suggesting most of the vessels were fired in a low oxygen or reducing environment, and then pulled from the fire to cool, leaving lighter-colored interior and/or exterior surfaces. Some fire mottling is present over the sides of some of the sherds (Figure 75). Vessel interiors are generally more smoothed than the exteriors, although this condition is not universal throughout the collection.

Given the lack of decoration on over 95 percent of the sherds, coupled with their frequent small size (less than five centimeters per side), it is extremely difficult if not impossible to determine pottery types for most of the sherds. However, many of the sherds are highly sandy in nature, so much so that during the time since they were broken, erosion has caused an overall rounding of the edges. This is a very common trait of Goose Creek pottery, both Goose Creek Plain and Goose Creek Incised.

Goose Creek Plain and Goose Creek Incised pottery are the dominant ceramic types for much of the Upper Gulf Coast. The type is characterized by varying amounts of sand temper with sandiest sherds feeling almost like sandstone. Pulverized bone temper has been reported but is rare (Suhm et al. 1954; Suhm and Jelks 1962). Texture is fine to coarse depending on the size of the sand grains used as temper. Color



Figure 76. Typical sherds of sandy Goose Creek Plain pottery from the Wood Springs site (41LB15).

of Goose Creek sherds typically varies from gray to brown to reddish-brown to almost black, but buff, tan, yellow-brown and orange-brown have also been reported. Fire mottling is present on almost all vessels. Cores of the sherds are dark gray to black and are significantly darker than either the exterior or interior of vessels. Wall thicknesses range from as much as 10 mm or more near the base to as thin as 3 mm on the rims (Figure 76). It is assumed that virtually all of the Goose Creek pottery was produced locally in Southeast Texas.

Almost no complete Goose Creek vessels exist, but based on base and rim sherds three general vessels shapes are known. These include (1) deep bowls with

hemispherical bodies up to 45 cm in diameter, (2) cylindrical jars up to 25 mm or more in height, and (3) cylindrical vessels with a slight inward carination from the mid-body to the rim.

Goose Creek Incised is virtually identical to Goose Creek Plain but contains decoration near the rim. Decorations typically consist of one to six horizontal lines just below the lip of the vessel. These lines may or may not be above a series of circular punctations (Figure 77).

One of the common characteristics of Goose Creek pottery is the presence of drilled holes, usually near the rim. These are thought to have been intentionally made to hold carrying straps made of



Figure 77. Typical sherds of Goose Creek Incised pottery from the Moss Hill site (41LB65).



Figure 78. Goose Creek Incised pottery from the Moss Hill site (41LB65) showing perforation below the rim. Note the fire mottling across the sherd.



Figure 79. Baytown Plain grog-tempered sherds from the East Tempe site (41PK66).



Figure 80. San Jacinto Incised sherd from the Moss Hill site (41LB65).

cord. Holes drilled significantly below the rim are believed to have been to help seal cracks using cord or thongs. The Kyle Collection has a number of sherds which show this intentional perforation (Figure 78).

It would be a Herculean task to count and attempt to type all of the ceramic sherds present in the Andy Kyle Archeological Collection. During the 1980's, members of the HAS estimated that the entire collection contained some 3,000 projectile points of

all types and a total of 10,000 total artifacts. The projectile point estimate would seem to be fairly accurate as almost all the points are mounted on boards and can be more easily counted. However, the sheer volume of ceramic sherds, stored in dozens and dozens of boxes, far exceeds the 7,000 needed to reach 10,000 total artifacts. We would conservatively estimate that the number of pottery sherds alone exceeds 20,000 to 30,000. Of these, well over 90



Figure 81. Probable Maydelle Incised sherd from the Moss Hill site (41LB65).



Figure 82. Possible Duren Neck Banded sherd from the Moss Hill site (41LB65).



Figure 83. Possible Weches Fingernail Impressed sherds from East Tempe (41PK66) (left) and the Moss Hill site (41LB65) (right).

percent and probably closer to 98-99 percent are plain ware, mostly Goose Creek Plain and/or Baytown Plain.

By 1000 A.D. some of the pottery along the Upper Gulf Coast came to be tempered with grog (crushed fired clay), a technology probably borrowed from Louisiana as the ceramics closely resemble the Coles Creek and Plaquemine traditions of the Lower Mississippi Valley. These ceramic types are known as Baytown if plain (undecorated) (Figure 79) and San Jacinto if incised (decorated) (Figure 80). San Jacinto Incised ware has decorative patterns which are almost identical to those seen in Goose Creek Incised. Typical decorative patterns include a series of horizontal incised lines below the vessel lip which



Figure 85. Broken pipe bowl from the Moss Hill site (41LB65). Note the charred interior due to use.



Figure 84. Possible Poynor Engraved sherd from the Indian Ridge site (41LB24).

are intersected by vertical lines that extend from the rim down the vessel body (Aten and Bollich 2002).

In addition to the locally produced ceramics, a few sherds probable ancestral Caddo manufacture are present in the Kyle Collection. These are noticeably thinner, better fired, more highly decorated, and have either fine-grain sand and/or grog-based temper. Possible types observed in the collection include Maydelle Incised (Figure 81), possible Duran Neck Banded (Figure 82), extensively horizontally-punctated ware, possibly Kiam Incised (?), Weches Fingernail Impressed (Figure 83), and deeply incised ware, possibly Dunkin Incised. Many of these decorated sherds show incised triangular zones filled with rows of small tool punctations which is characteristic of Maydelle Incised ware (see Figure 81). Two sherds of engraved ware were identified which have a finely-etched curvilinear-hatched corners characteristic of Poynor Engraved vessels (Figure 84). Several brushed sherds are present in the collection which show horizontal brushing near the rim and vertical brushing on the body, both characteristic traits of Bullard Brushed jars.

The majority of the above ceramic vessel sherds appear to be from ancestral Caddo vessels made in East Texas sometime after ca. A.D. 1400, and traded/exchanged with the native occupants of Southeast Texas. These sherds are tempered with grog, grog-bone, and bone, and have decorative elements consistent with defined ceramic types belonging to the Frankston phase (Maydelle Incised, Poynor Engraved and Bullard Brushed) (Pertulla 2011).

Another possible trade item with the ancestral Caddo are several clay pipe bowls, all of which were broken but show extensive charring from use. One of these had a number of nodes around the base of the bowl and almost certainly represented an item of significant status (Figure 85).

It is uncertain how much the Late Prehistoric inhabitants of Southeast Texas were dependent on, or even had cultigens such as maize (corn). Contact with the ancestral Caddo to the north certainly opens the possibility of access to cultigens through trade. No burned corn cobs or kernels were observed in the collection. However, large grinding stones (manos) and their larger basin rocks (metates) are present in the collection so purposeful use of a grain-based agriculture cannot be ruled out.

### **Conclusions and General Observations on Southeast Texas Prehistory**

The Andy Kyle Archeological Collection represents assemblages from over 90 sites across nine Southeast Texas counties and includes tens of thousands of artifacts. As such, it represents the best single collection available for the study of Southeast Texas archeology. Based on our observations and study of the entire collection, the following general observations and conclusions can be made with regard to the prehistory of Southeast Texas.

#### **Paleoindian Period**

As mentioned above, many of the sites represented in the Andy Kyle Archeological Collection show evidence of very long-term occupation, ranging from Paleoindian to Late Prehistoric. In fact, since most of the sites Mr. Kyle collected at were surface sites, it is not uncommon to find Paleoindian projectile points and pottery sherds in the same box. That does not mean that all of the long-term occupations were continually inhabited. More than likely the sites represent temporary campsites that were visited seasonally, gradually becoming more and more permanent occupations over time.

The earliest occupation present in the Andy Kyle Collection from the Wood Springs site in Liberty County is Clovis. This early period is represented by several diagnostic artifacts including two broken fluted point bases, two large Clovis blades, and two overshot flakes. Additionally, two small prismatic blades and a side scraper/perforator made from a large blade may also be part of the Clovis occupation at the Wood Springs site. Moreover, the Wood Springs site was the only locality in the entire collection that had extinct fauna and their association with the one site

that had Clovis material is likely not coincidental. While Clovis points have been found elsewhere in Southeast Texas (Angelina County, n=16, Jasper County, n=3, Polk County, n=2, Tyler County, n=1, and Jefferson County, n=97) (Bever and Metzger 2007), the two points from the Wood Springs site mark the first reported occurrence of Clovis people in Liberty County. Clovis sites have now been firmly dated between 13,500 and 12,900 years BP (Stanford and Bradley 2012), thus establishing the region's earliest human occupation to have been no later than approximately 13,000 years ago.

The Wood Springs site would not have been a permanent campsite but more likely a seasonal site periodically visited by bands of Clovis hunters following big game animals. The site has abundant water and would have made an ideal campsite. The Clovis people at the Wood Springs site were likely a small band of nomadic hunters who camped at the site because of its permanent source of water. The springs were also a likely draw to the area's mammals, which would have also made the location an opportunistic hunting area. This supposition is supported by the fragments of proboscidean enamel found in the same collection as the other artifacts of Clovis affinity. It should be noted that sea level was considerably lower 13,000 years ago than it is today due to the large volume of water taken up in Late Pleistocene ice sheets. As such, the area encompassed by Liberty County today was more of an open grassland prairie and would have been much less wooded 13,000 years ago (Ricklis and Weinstein 2005).

Trace element geochemical analysis of the Clovis artifacts from the Wood Springs site could not unambiguously show that they are made from Edwards chert. Thus a geochemical relationship to artifacts found at the Timber Fawn Clovis site (41HR1165) located less than 50 km to the west in Kingwood, Texas, could not be proven (Crook et al. 2016). Clovis sites with eastern Edwards Plateau cherts have now been found at the Hogeeye cache in Bastrop County (Waters and Jennings 2015), at the Timber Fawn site in Harris County (Crook et al. 2016), in Polk County (Williams and Crook 2013), and at McFaddin Beach in Jefferson County (Long, 1977; Williams and Crook 2013). The location of these occurrences indicates a possible southeastward movement from the Edwards Plateau which may represent seasonal journeys to collect salt along the Gulf Coast while hunting large game animals along the way (Crook et al. 2016). The possible connection between the Clovis occupation at Wood Springs and other sites east of the Edwards Plateau is intriguing and may represent a movement pathway across Southeast Texas. Hopefully, expansion of the

geologic database at the GSAR XRF laboratory will ultimately show a connection between the artifacts at Wood Springs and those from other Clovis sites, including Timber Fawn.

The post-Clovis Paleoindian artifacts present in the Kyle Collection are heavily weighted to the latter part of the Paleoindian period and include Dalton (2), Meserve (3), San Patrice (37), Pelican (1), Scottsbluff (1), Angostura (4), and Keithville (5) points. With regard to the San Patrice points, both Hope, St. John and Rodgers Side-Notched varieties are present (see Figures 3-5).

With the exception of the San Patrice points, almost all of the Paleoindian points and 100 percent of the associated artifacts (scrapers, bifaces) are made from high quality chert, probably Edwards chert from Central Texas. The San Patrice points in the collection are made from a variety of orange, red and yellow-colored cherts, jaspers and/or a deep blue-black-colored petrified wood. These lithic materials are non-local and may represent a Louisiana origin.

### **Early Archaic Period**

Like the Paleoindian period, the Early Archaic is sparsely represented in the Andy Kyle Archeological Collection. Artifacts from this time period reflect an assemblage that is characteristic of the Carrollton Phase Archaic, as originally described by Crook and Harris (1952, 1954) and subsequently redefined by Prikryl (1990) and Crook (2007c). The only element from the type description of the Carrollton Phase which is not present in the Kyle Collection is the Carrollton double-bitted axe. The Carrollton Phase spans the latter part of the Early Archaic and into the Middle Archaic (Crook 2007c). It is included here as Early Archaic but undoubtedly some of the smaller dart points, such as Dallas points, are Middle Archaic in age and other artifacts may span into the Middle Archaic as well.

A high percentage of the artifacts, especially the projectile points and large cutting tools, are made from high quality gray and cream-colored cherts which are not of local origin. Based on their fluorescence under UV radiation, most if not all of this chert appears to have originated in the Edwards Plateau of Central Texas. This implies at least some periodic contact between Central Texas and Southeast Texas during the Early Archaic.

Crook and Harris postulated that the Carrollton Phase probably extended both down the Trinity River drainage system as well as laterally east and west of the Trinity to some unknown extent (Wilson W. Crook, Jr. and R. K. Harris, personal communication, 1979). A few elements of the Carrollton Phase (Carrollton, Dallas, and Wheeler Leaf points, Clear

Fork gouges, net sinkers) were found as far west as Hood County at the Acton site (Blaine et al. 1968). Similarly, Carrollton Phase dart points have been reported from sites in Harris, Fort Bend, Wharton, Gaines and Washington Counties along the Gulf Coastal Plain (Patterson 1982, 1983, 1991, 1996, 1998; McClure and Patterson 1988; Patterson and Huggins 1987). None of these reported occurrences contained a full suite of the lithic traits found in the Upper Trinity River watershed. Similarly, the sites in the Kyle Collection from counties east of Liberty County also contained only a few random elements. The more complete suite of Carrollton Phase Archaic artifacts was found only in the five sites near the Trinity River in Liberty County.

The presence of virtually all the elements of the Carrollton Phase Archaic in Southeast Texas demonstrates probable contact with North Central Texas along the Trinity River as postulated by Crook and Harris (Wilson W. Crook, Jr. and R. K. Harris, personal communication, 1979) and by Patterson (1983, 1991, 1998). The discoveries described herein thus extend the known range of the Carrollton Phase Archaic from North Central to Southeast Texas along the Trinity River drainage and open up the possibility that additional sites may be found between Dallas and Kaufman Counties in the north and Liberty County to the south.

### **Middle Archaic Period**

The greater abundance of artifacts that can be ascribed to the Middle Archaic period in the Kyle Collection suggests an increase in population density in Southeast Texas relative to the previous occupational periods. Moreover, a greater usage of local lithic material (quartzite, petrified wood) is suggestive of a more restrictive nomadic lifestyle and thus less contact with either Central or North Central Texas. To compensate for the lack of natural high quality toolstone, almost all of the quartzite and petrified wood artifacts, as well as many of those made from chert, show evidence of extensive heat treating.

There is little bone material present in the collection but what bone is present is almost exclusively whitetail deer, which must have provided a majority of the peoples' diet. This diet was augmented by nuts, berries and wild seeds, the use of which can be indirectly seen in the appearance of small grinding stones and nutting stones. No turtle or mussel shell is present in the collection but was undoubtedly exploited in the Trinity river and its tributaries.

One of the most diagnostic artifacts present in the Middle Archaic are the uniquely double-notched

Evans dart points. Over 20 have been identified and all are made from a non-local chert which does not fluoresce under UV radiation. Evans points originate in western Louisiana and are found as a minor constituent in Middle Archaic sites in East Texas along the Louisiana border (Turner and Hester 1983, 1993, 1999). The relative abundance of Evans points in the Kyle Collection suggests periodic contact across the Sabine river with the Archaic peoples of southwestern Louisiana.

### Late Archaic

The significant increase of artifacts in the Kyle Collection that can be ascribed to the Late to Transitional Archaic period is strongly suggestive of a major increase in the area's population during this period. This expansion in population further connotes a more sedentary, less nomadic lifestyle which is supported by the almost exclusive use of local toolstones for all lithic artifacts, from projectile points to utilitarian cutting and scraping tools. Many of these artifacts show traces of red hematite staining which is indicative of heat treating of the raw toolstone material prior to lithic reduction.

While the Late Archaic peoples of Southeast Texas appear to have led a more sedentary lifestyle than previous occupational periods, there is still evidence of continued contact to the east with Louisiana as seen in the presence of Pontchartrain and Motley dart point types.

### Late Prehistoric Period

Due to the large quantities of pottery and other artifacts in the Kyle Collection, it appears that the indigenous population of Southeast Texas reached its greatest extent during the Late Prehistoric period. The large population increase is suggestive of the introduction and growing dependence on agricultural foods (maize, beans, etc.) in addition to the area's natural floral and faunal resources.

The Late Prehistoric marks the introduction of significant technological changes in Southeast Texas prehistory. The first of these is the appearance and initial use of the bow and arrow as a weapon system. It is unknown if the bow and arrow replaced the atlatl and dart relatively quickly in Southeast Texas or the aboriginal inhabitants of the area maintained a dual weapon system for some time as has been observed elsewhere in Texas (Tomka 2013; Crook and Hughston 2015). The Kyle Collection arrow point assemblage is represented by large numbers of Alba and Catahoula points, with a lesser number of Perdiz points. The Scallorn point type is one of the most common arrow points across Texas during the Late

Prehistoric periods and is contemporaneous with Alba and Catahoula types (Crook and Hughston 2015; Turner and Hester 1985, 1993, 1999). Its complete absence from all the sites in the Kyle Collection is problematical and can only be explained by assuming its distribution lies more to the west.

The other arrow point type present in the collection is the Friley. Friley points originate in Louisiana and are found only in East Texas near the Louisiana border. As with the Evans, Pontchartrain and Motley dart points, their presence represents a continued contact with people to the east of the Sabine river.

No triangular arrow point types (Fresno, Washita, Harrell) are present in the collection which would seem to indicate little to no contact with the peoples of the Southern Great Plains. As such, it is unlikely that the aboriginal inhabitants of Southeast Texas had access to any bison resources.

The other major technological innovation during this period is the introduction and widespread use of ceramics. The majority of the pottery in the collection appears to be locally made and is of the various varieties of Goose Creek Plain and Goose Creek Incised types. Temper is primarily sand, sometimes very coarse, but small amounts of bone is also present. Other locally produced ceramic types include Baytown Plain and San Jacinto Incised ware.

No complete or mostly complete ceramic vessels are present in the collection. However, based on bases and rim sherds the vast majority of the ceramic vessels appear to be flat-bottomed jars and bowls, some exceeding 35 cm in diameter and 35-45 cm in height. Many of the sherds have been extensively blackened on the exterior surfaces from fire and were most likely cooking related vessels. Interior surfaces of some of these sherds still retain the greasy residue of the cooked products and would be an excellent candidate for further study and potential identification of the floral and/or faunal contents. Moreover, age dates could probably be obtained from careful scraping of the organic residue.

A small amount of ancestral Caddo pottery is present including incised ware, fingernail punctate (impressed), brushed ware, engraved ware and one corn cob impressed sherd. These ceramics indicate some degree of contact with the ancestral Caddo peoples to the north in East Texas.

Several blackened pipe bowls are present which indicates the aboriginal inhabitants of Southeast Texas had access to tobacco, either via trade or grown locally. If the tobacco was obtained via trade, the likely source would have been with the ancestral Caddo in East Texas.

A large number of Mineola or Harvey bifaces are present in the collection. These tools are restricted to

East Texas along the Louisiana border and are exclusively constructed from petrified wood. Unlike the majority of petrified wood tools, none of these bifaces show any evidence of heat treating which may reflect their relative simplistic nature and thus the lack of a need to increase toolstone quality prior to construction.

Mineola bifaces are thought to have been primary woodworking tools, functioning as hand-held or hafted adzes (Turner and Hester 1985, 1993, 1999). If so, their appearance and abundance in Southeast Texas at this time could be representative of more permanent house structures or possibly even the use of canoes along the Trinity river.

There are a large number of finely-made drills, almost all of which are made from either heat-treated chert or petrified wood. The drills seem to correlate with an apparent increase in prestige goods such as beads and other ornaments of shell, stone and bone. There is also an increase in usage of red ochre ( $\text{Fe}_2\text{O}_3$ ) seen as both worked pieces of ochre and as staining on smooth stones.

Two small pieces of galena (PbS) were found in association with pottery at the Moss Hill site (41LB65). While galena is known in small quantities from Central Texas (Burnet County), both pieces in the Kyle Collection occur in a matrix which is more akin to galena from the Tri-State District of Oklahoma-Missouri-Arkansas (Crook and Hughston 2014). These pieces were obtained via long-distance trade, again probably through the ancestral Caddo in East Texas.

There is an almost complete lack of bone tools in the collection which is likely the result of poor preservation in surface sites with acidic soils rather than an indication of non-use. What bone is present is almost exclusively whitetail deer although one incisor from a beaver, two canines from a bear, and several small rodent bones are also present.

A similar observation was made by Jelks (2017) at the sites in and around Sam Rayburn Reservoir where only 35 bone tools were found in 13 sites.

### **Future Research Potential**

As stated above, the Andy Kyle Archeological Collection represents an unparalleled study collection of Southeast Texas prehistory. While much more work has been done on the prehistory of Harris County and the surrounding counties to the west and south by members of the Houston Archeological Society, little serious research has been conducted and published on the counties represented in the Kyle Collection. As such, the collection provides a wealth of potential future research.

One area which needs considerable work is a detailed study on the collection's ceramics, including a detailed assessment of the types present and study on temper materials and construction methods. A potential side study should include an analysis of the food residue present on the interior surfaces of many sherds plus the potential for obtaining age dates on the ceramics from this organic material. Ceramics along the Upper Gulf Coast are poorly described and even poorer dated. Such a study on the Kyle Collection material would be of immense value to understanding the Late Prehistoric period of the area.

Another potential avenue of research would be to look in detail at the dart point morphology across the various Archaic time periods with an emphasis on the degree of resharpening and re-use prior to ultimate discard. A similar study is underway on material from the Dimond Knoll site (41HR796) in western Harris County and the results from both collections would be of great value with regards to Texas point typology (Jason W. Barrett, personal communication, 2017).

Another area of possible future research would be to study the collection's different chert and petrified wood types using X-Ray Fluorescence technology with a focus on identifying lithic sources. Such a study should build on the methodology developed by Williams and Crook (2013) on sourcing cherts from the Edwards Plateau. The extensive use of petrified wood as a primary lithic toolstone, especially from the Middle Archaic period on, separates Southeast Texas from the rest of the Upper Gulf Coast. Very little is known about the source of this material, how heat treating improves its ability to be flaked, etc. A study of these issues would not only be of value to understanding Southeast Texas archeology but would aid the overall understanding of Texas lithic resources.

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**APPENDIX I**  
**XRF Results – Trace Element Geochemistry of Wood Springs Clovis Artifacts (ppm)**

Element	Clovis Point #1	Clovis Points #2	Blade #1	Blade #2	Overshot Flake #1
Calcium	4555	4427	4481	4384	14392
Titanium	371	221	174	220	150
Chromium	0	0	0	0	0
Manganese	207	71	92	77	67
Iron	5953	2861	2614	2624	2624
Cobalt	6	3	3	3	3
Nickel	12	10	12	11	8
Copper	0	0	0	0	0
Zinc	0	0	0	0	0
Arsenic	0	0	0	0	0
Rubidium	10	10	10	9	10
Strontium	19	23	11	16	15
Yttrium	22	22	23	22	23
Zirconium	34	34	34	34	34
Niobium	6	6	6	6	7
Molybdenum	49	49	51	49	49
Tin	2	2	1	2	2
Antimony	0	0	0	0	1
Barium	600	603	1273	598	807
Lead	7	7	7	7	7
Thorium	6	6	6	6	6
Uranium	2	1	12	5	12
Probable Source	Unknown	Unknown	Unknown	Unknown	Unknown

**APPENDIX I**  
**XRF Results – Trace Element Geochemistry of Wood Springs Clovis Artifacts (ppm)**

Element	Overshot Flake #2	Prismatic Blade #1	Prismatic Blade #2	Side-Scraper on Blade
Calcium	4545	3862	4172	4382
Titanium	221	169	268	201
Chromium	0	0	0	0
Manganese	66	75	76	79
Iron	2561	2715	3256	3071
Cobalt	3	2	3	3
Nickel	10	5	8	11
Copper	0	0	0	0
Zinc	0	0	0	0
Arsenic	0	0	0	0
Rubidium	9	11	10	10
Strontium	19	12	19	15
Yttrium	22	20	22	23
Zirconium	32	28	33	33
Niobium	6	5	6	6
Molybdenum	46	36	46	50
Tin	2	2	2	1
Antimony	0	14	4	0
Barium	604	2440	1038	675
Lead	7	7	7	8
Thorium	6	6	6	6
Uranium	5	13	2	13
Probable Source	Unknown	Unknown	Unknown	Unknown