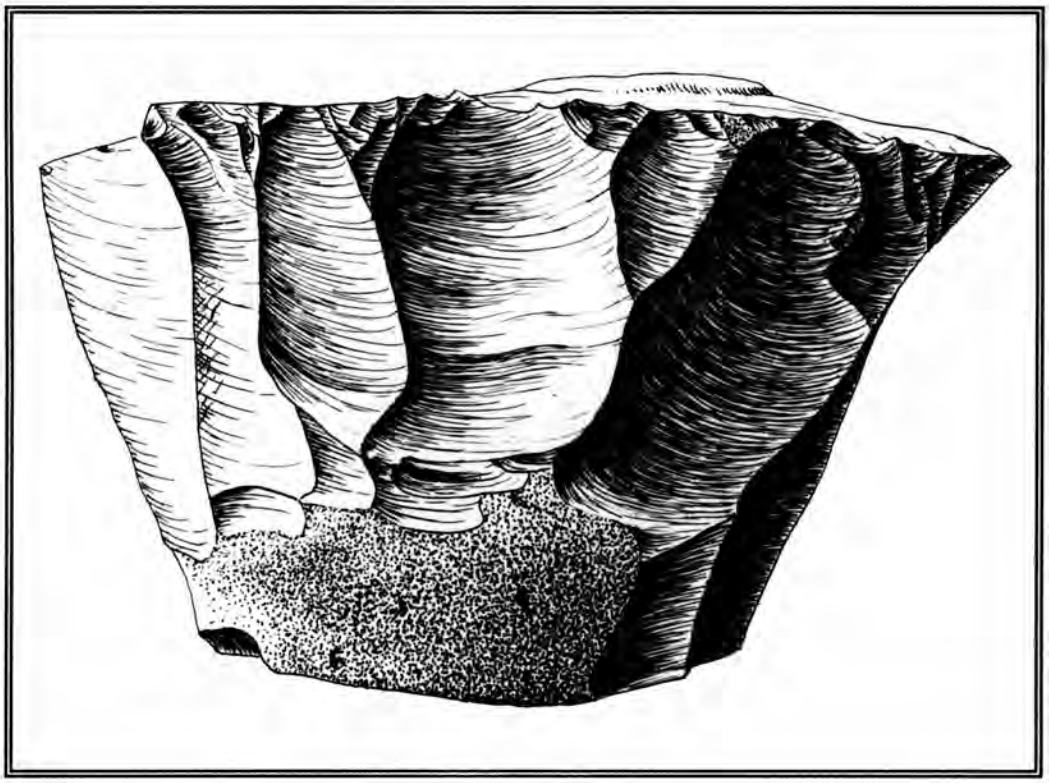
# LA TIERRA



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LA TIERRA

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Shirley Van der Veer
Editor



About the Cover: One view of a polyhedral core found in northeast San Antonio. See paper by C. K. Chandler on page 14. Drawings by Richard McReynolds are on pages 15, 16 and 19, as well as the cover.

Manuscripts for the Journal should be sent to: Mrs. Shirley Van der Veer, Editor, *La Tierra*, 123 East Crestline, San Antonio, Texas, 78201-6613, email shirleyvan@worldnet.att.net. Past issues of the Journal and Special Publications available by requesting an order form from STAA (Jim Mitchell), P. O. Box 791032, San Antonio, Texas 78279, or from the STAA internet site (see below). Dr. T. R. Hester may be contacted at the Texas Archeological Research Laboratory, Pickle Research Center, Building 5, 10100 Burnet Rd, Austin, Texas, 78712-1100.

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## FROM THE EDITOR

1998 has been an eventful year for the Southern Texas Archaeological Association—we have participated in a fine field school in Victoria with the Texas Archeological Society, a TAS function to which many STAA members have donated much time and effort. We have seen the formation of an STAA web site* thanks to Jimmy Mitchell, bringing news of our activities to the "surfing" public. Our membership is stable, and we are noting the addition to our governing body, the Board, of some fine young people, with new ideas and enthusiasm—both of which are immensely necessary for the growth and stability of an organization. With this kind of leadership the new century will surely bring some more outstanding activities and interests to the archaeology of this region.

It has become apparent, through the years, that *La Tierra* is one of the drawing cards for membership in STAA. Therefore, every effort has been made by the various editors from the beginning, 25 years ago, to bring interesting and informative manuscripts to our readers. Your present editor is always on the lookout for more papers—and MORE papers! (Does that sound like a hint??)

It is hoped to eventually bring the Journal to sixty pages per issue each quarter. However, this means that we must call on our readers and archaeology friends both avocational and professional for papers derived from their records and artifacts. Size of papers can be anywhere from one to 25 pages.

Our avocational and professional members and friends have much to contribute, and here and now an invitation is extended to you all to consider publishing in *La Tierra*. A call is hereby made for papers for consideration. Papers are always needed, so Email the editor at shirleyvan@worldnet.att.net if you have questions. This issue includes the Information for Contributors page. And thanks in advance for your input!

A new magazine—*Discovering Archaeology**—has just come into being. Editor is Jeff Leach, Rio Hondo Publishers, El Paso, TX. Published bi-monthly, cost is $19.95 per year. Send subscription with check to *Discovering Archaeology*, P. O. Box 190, Jenks, OK, 74037-9906. Personal copy is a real gem, illustrated, glossy, comprehensive, very readable and should be a fine addition to your archaeology library....

Here's to 1999—May it be a great one for all!

Editor

* NOTE: STAA web site: http://www.ijoa.org/staa.html

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# ROGER HUNT HEMION

## 1911-1998

Roger H. Hemion (standing), during field work at 41BX229 in summer, 1977.
Hemion is planning, with Jules Jaquier (seated to the right), transit survey at the site.
Photo courtesy of Ellen Sue Turner

Roger Hunt Hemion passed away on August 16, 1998. Born in Kearney, New Jersey on September 18, 1911, his education included an undergraduate degree from Iowa State University (mechanical engineering), a Master's in automotive engineering at Chrysler Institute and work toward a doctorate at the University of Michigan. In the late 1970s and early 1980s, he took courses in archaeology at The University of Texas at San Antonio. He served in the United States Army from 1937-1964, retiring with the rank of Colonel. Later, he worked as a research scientist for Southwest Research Institute, retiring in 1974.

Roger was an early member of the Southern Texas Archaeological Association [STAA], joining in 1977. He became heavily involved in the work of the STAA, and did an outstanding job as its Secretary, serving for a decade (1979-1989). He also served as Mailing Chairman for several years in the early '90s. He and his wife, Marge, wrestled with the many heavy bundles of *La Tierra* and the *Newsletter*, getting them in the mail in record time. Roger authored two papers for *La Tierra* in 1980, analyzing arrow points and selected ground stone artifacts from the Bromley F. Cooper Collection.

I had the pleasure of working with him when he enrolled as a graduate student in the 1977 UTSA summer field school held at the St. Mary's Hall site (41BX229). During this field school, he worked not only at St. Mary's Hall, but also assisted the late Jules Jaquier in test excavations at the Panther Springs Creek site (41BX228).

Aside from his long stint as STAA Secretary, Roger is best known for his *Field and Laboratory Handbook*, published initially in 1983 as Special Publication No. 2 of the STAA. It was published in a revised edition in 1988. This is a unique publication that, though only 86 pages long in the 1988 edition, provided guidelines for field archaeology, follow-up laboratory analysis, report preparation, oral presentations at meetings, and a series of highly useful appendices, including a paper on plane table mapping contributed by Kenneth M. Brown. It is a "user-friendly" guidebook, still in print and available through STAA. The Handbook has been a valuable supplement required for students on a number of my university field schools.

It is unfortunate that Mr. Hemion's declining health and worsening eyesight in the 1990s kept him from interacting with newer members of the STAA. He was a stalwart in this organization and it is clear that his involvement played an important role in the growth and maturation of the STAA.

Thomas R. Hester

# *NOTES ON SOUTH TEXAS ARCHAEOLOGY 1998-4: "Coahuiltecan": A Critical Review of an Inappropriate Ethnic Label*

*Thomas R. Hester*

## Origins of the Myth

For over 100 years, the myriad of hunter and gatherer groups who once inhabited parts of southern Texas and northeastern Mexico have been referred to as "Coahuiltecans." Many of these peoples went into the Spanish mission system in the 18th century, with most dying of disease, but with some surviving and eventually being absorbed into Spanish/early Tejano culture (Campbell 1983). As we all know, the Spanish recorded very little about the aboriginal lifeways, leaving behind primarily a long list of group names (which T. N. Campbell has researched for many years; cf. Campbell 1988), and a few samples of the languages spoken by some of the peoples. Fray Bartholome García, in 1760, collected language samples from Indians at Mission Espada, using these in a manual for instructing the neophytes; Fray Gabriel de Vergara had done a similar manual in 1732 for the Pajalate Indians, many of whom were at Mission Concepción. While Fray García noted that this tongue that was rather widely spoken, he never referred to it as "Coahuilteco" nor to its speakers, during the Colonial era, as "Coahuiltecans." The title page to his manual lists numerous specific named groups; some, like the Venado, probably learned this language only after coming to the San Antonio missions from their homeland in northeastern Mexico. Instead, the use of these terms derive from linguistic studies by Mexican scholars (e.g., Orozco y Berra in 1864 and Pimentel in 1865), at which time they labeled one of the major languages of the South Texas and northeast Mexico Indian as "Coahuilteco." J. W. Powell followed up, in 1891, by referring to the speakers of Coahuilteco as "Coahuiltecans." And, by 1907, F. W. Hodge had an entry for "Coahuiltecan" in the *Handbook of American Indians North of Mexico*. But, both Powell, and later Hodge, cautioned against how the label should be used. Hodge (1907: 314) states:

> "The family [Coahuiltecan] is founded on a slender basis, and the name is geographic rather than ethnic, as it is not applied to any tribe of the group...."

Later anthropologists, such as Beals (1932: Map 1) ignored this advice, and used the linguistic classification to draw boundaries of an area of Coahuilteco "ethnic groups" in eastern Coahuila, Nuevo León and Tamaulipas. Mayhall (1939) in her early synthesis of Texas Indians briefly refers to the native peoples of the Rio Grande Plain as having been comprised of some "seventy-odd" cultural units, "group[ed] under the name Coahuiltecan." Texas archaeologists quickly picked up the Coahuiltecan label, as seen in Sayles (1935; "Coahuiltecan branch," "Coahuiltecan tribes," p. 41), Jackson (1938, referring to Coahuiltecan pottery), and Suhm, Krieger and Jelks (1954:142; the "Coahuiltecan stock" of southwest Texas). These are just examples, not singled out for criticism, of the widely accepted use of the term that continues up to the present time, including by the present author on numerous occasions (e.g., Hester 1989).

## A Language Becomes "Culture"

Swanton (1940) did a comprehensive review of the linguistic material and published word lists, derived from Spanish records, of the peoples of South Texas and northeast Mexico. Though he uses the term "Coahuiltecan" to refer to the word lists obtained by Father García and others, he also noted inconsistencies in "Coahuilteco" language that likely reflected the different time periods at which the scraps of language were recorded. He also pointed to other languages, or dialects, recorded by A. S. Gatschet, and in a final assessment of the linguistic situation, Swanton (1940:7) declared: "the marked differences these vocabularies exhibit only accentuate...that in the territory in question, linguistic diversity was the rule. Just what this signifies we have yet to learn, but the fact renders the fragmentary nature of our records all the more deplorable." However, the use of "Coahuil-

tecan" assumed even more significance when anthropologists in the 1950s and 1960s reified the idea of a "Coahuiltecan" cultural pattern that included the native peoples of the South Texas region. Frederick Ruecking, Jr. (1955) published a series of papers on the "Coahuiltecans," in the *Texas Journal of Science*, making generalizations about social organization, economy, and ceremony, applied to all manner of South Texas-northeast Mexico hunters and gatherers. Indeed, in his Master's thesis at the University of Texas, Ruecking assembled a temporally and spatially diverse array of data on the Indians of the Texas-Mexico borderlands and described in detail the many facets of the "Coahuiltecan culture." (p. 254). [A sharp critique of his approach is presented by Campbell and Campbell (1985:20-21)]. Shortly thereafter, in his popular book on the Texas Indians, W. W. Newcomb, Jr. (1961) followed Ruecking's lead and authored a synthesis of the "Coahuiltecan" way of life. As Ruecking had done, Newcomb compiled into highly-readable fashion an aggregate of cultural traits from broadly scattered hunter-gatherer groups, using data collected by the Spanish at different times and from varied geographic regions, providing a generalized picture of "a savage world more apt to repulse than attract" (Newcomb 1961:56). The application of "Coahuiltecan" in a broad and uncritical fashion is also seen in papers by Troike (e.g., Troike 1961).

## Debunking "Coahuiltecan"

Nunley (1971) wrote a badly-needed critique of these generalized ethnologies, arguing that the archaeological record of southern Texas and northeastern Mexico could not be interpreted on the basis of such a "particularistic model" of Coahuiltecan "culture." He pointed to four key factors: problems in translation; the variability of reliable reporting; the amount of culture change that occurred in the area in the 16th-18th centuries, and unreliable responses by Indian informants (e.g., some ethnohistoric data were obtained after Indian groups had been much affected by Spanish contact). Nunley (1971:308) offered this appropriate summation of the issue:

> ....one great shortcoming of extant Coahuiltecan ethnographies has been the tendency on the part of the writers to "lump" all the bits and pieces of information together under the rubric "Coahuiltecan." Thus, we are faced with data which, even if reliable in all other aspects, quite likely refer to totally distinct sociocultural units spread over a vast area and through more than two hundred years. To consider these data to represent a sociocultural entity approaches the absurd.

Though Nunley's paper did not, unfortunately, attract much attention from Texas archaeologists and anthropologists, cracks were beginning to develop in the concept of a monolithic Coahuiltecan culture. Ives Goddard (1979), a linguist with the Smithsonian Institution, reviewed the scraps of language from Indian groups in South Texas, and noted at least six different linguistic groups: Coahuilteco, Karankawa, Comecrudo, Solano, Tonkawa, and Aranama. In his opinion, there likely were other languages beyond these. Indeed, Johnson and Campbell (1992) have since published a detailed study of the Sanan language, previously unknown in Texas and Coahuila (or bits of which had been linked erroneously by earlier scholars to Tonkawa). The speakers of Sanan, a dozen small aboriginal groups, were found in two separate areas, one in northeastern Mexico, both in Coahuila and Nuevo León; the other area is in the middle Guadalupe River basin. This is considered the main cluster, and the Sanan speakers there "... dedicated considerable energy to killing buffalo" (Johnson and Campbell 1992:207). Some groups of Sanan entered Mission San Antonio de Valero in the 1740s.

In *Digging into South Texas Prehistory* (Hester 1980), and aware of the critique by Nunley and the study by Goddard, I wrote: " In reality, there were no "Coahuiltecans," but rather dozens or even hundreds of independent small groups who had similar lifeways" (ibid.:39). I also noted T. N. Campbell's cautious and critical observations on these groups and the linguistic appellation given them. I proceeded to refer to the Coahuiltecan speakers as "Coahuilteco" and to note (p. 40) that there were "other hunting and gathering Indians in southern Texas." This was hardly a great leap forward, since I then went on to give a traditional overview of these "Coahuiltecos" that served only to reinforce the idea that this, or any other label, meant something in an ethnic sense in South Texas.

Campbell and Campbell (1981) later reviewed the Cabeza de Vaca narrative, examining the Indian groups with whom he came in contact. They provided an eloquent statement about the use of the term "Coahuiltecan," one which Prof. Campbell had been espousing for a number of years:

> "Originally this name was used to refer only to certain groups that were believed to have spoken the language now known as Coahuilteco. In recent years the name Coahuiltecan has come to be rather loosely used to refer to nearly all of the hunting-and-gathering groups of southern Texas and northeastern Mexico, who are assumed to have had similar cultures. The widespread similarities in culture have never been demonstrated. As now commonly used, the name Coahuiltecan has about the same connotation as the name Chichimec, which in Mexico has long been used to refer to any hunting-and-gathering group north of the Valley of Mexico. It [Coahuiltecan] serves no useful purpose..." (Campbell and Campbell 1981:36-37).

Campbell (1983) subsequently published a synthesis for the *Handbook of North American Indians*, which despite its title ("Coahuiltecans and Their Neighbors") makes very clear that Coahuilteco was a recognized language spoken by less than 60 Native American groups in the region (Campbell 1983: Table 1).Campbell (1983:45) further noted, and most archaeologists and anthropologists continued to ignore, that while the Coahuilteco language was real, the speakers cannot be identified ethnically, and that for many groups, Coahuilteco was a "second language." Indeed, Father García, who had recorded bits of Indian language at the San Antonio and Guerrero missions, noted only 18 groups who spoke dialects of this language, and that in four groups, only the young knew how to speak it, indicating that it was a tongue learned during missionization.

**"Errors Should be Corrected, Not Perpetuated" (Campbell and Campbell 1985:77)**

By perpetuating the Coahuiltecan myth, archaeologists and anthropologists have done, and continue to do, a disservice to those people in South Texas who may have biological ties to the mission Indians of San Antonio, Goliad and Guerrero. We are at fault for providing such inaccurate, published statements that gave rise to the concept of a "Coahuiltecan" people (e.g., England's 1995 survey of urban Indians in Texas), when no such ethnic entity ever existed. A recent film produced by the National Park Service and shown at Mission San José, entitled *Gente de Razon*, treats the mission Indians in the most appropriate fashion I have yet seen. The narrator names group after group of mission Indians (from San Antonio and other Texas missions), "...Aranama, Caxcatle, Payaya, Tamique..." Not once, in 24 minutes, is "Coahuiltecan" even mentioned. That is indeed progress! Dr. Lee Johnson of Austin served as a consultant for the film, and to him must go the credit for moving toward the elimination of this meaningless cultural label, especially in a medium designed for public consumption.

So, what ethnic labels do we use? There are the 60 or so groups that Campbell believes were probable Coahuilteco speakers; maybe the term Coahuiltecan should be reserved for them, although they had their own group names and were never affiliated into any sort of political unit with that name. In the Espíritu Santo missions at 41VT11 (Mission Valley) and at Goliad, groups such as the Aranama preserved their identity into the 1840s. They clearly are not "Coahuiltecans." Similarly, in the Guerrero missions, Campbell (1979) notes many named ethnic groups who were not Coahuilteco speakers. Lumping the various South Texas languages into "Coahuiltecan" (as recently suggested by Ramer 1996) may be of use to linguists, but it confuses the issue for anthropologists interested in ethnicity. Of these languages (see Goddard 1979), only the Karankawa represent both an ethnic group and a language.

We can hope that some of the citizens of Goliad and San Antonio will be able to trace their ancestry back to mission Indians and to learn what they were called, as the priests usually recorded the names of individuals and their group affiliation in baptismal and registers. Perhaps even after years of missionization and acculturation, some of the surviving mission Indians, with their Hispanic names, remembered the identities of original groups into the 1820s and beyond. However, it has to also be realized that many of the hunting and gathering groups who came into the missions in San Antonio and elsewhere were not local, but had been displaced from distant

homelands as far away as northeastern Mexico. All of these variables are an unfortunate result of missionization, but they are far from being inconsequential today. The article by Barrios (1998) in the *San Antonio Express-News* that traces the ongoing battle between "Coahuiltecan" descendants and the Archdiocese over the excavation (in 1967) and subsequent study of burials from Mission San Juan Capistrano is clear evidence that the myth of a "Coahuiltecan people" will be with us for some time to come.

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# *MARINE SHELL ORNAMENTS AS ISOLATE OCCURRENCES IN THE FALCON RESERVOIR*

*James Bryan Boyd*


## ABSTRACT

*A number of marine shell ornaments found in various sites within the conservation pool area of Falcon Reservoir are examined. The ornaments were salvaged in non-mortuary contexts, and the occurrence of such artifacts as solitary finds is discussed. The sites where the ornaments were recovered are also briefly described.*


## INTRODUCTION

Falcon Reservoir is located on the lower Rio Grande, approximately 80 kilometers south of Laredo, Texas (see Figure 1). The lake was formed following the completion of Falcon Dam in the early 1950s. The conservation pool elevation is 301.2 ft. above mean sea level (amsl). The elevation of the reservoir fluctuates significantly on a regular basis as water is released through the dam for downstream use. These fluctuating water levels often expose numerous archaeological sites along both sides of the reservoir, in the U. S. and in Mexico.

The ornaments being reported were found in sites within the conservation pool, that is, below the elevation of 301.2 ft. amsl. The artifacts were recovered between 1984 and 1995. A total of eight artifacts are included; all but one are apparently made of conch. Seven of the artifacts were found on the Mexican side of the lake, and only one is from the U. S. side. The artifacts represent solitary occurrences; i.e., they were not found in association with burials. Marine shell ornaments are commonly found with burials in the Falcon Reservoir (cf. Boyd 1996a:13-17; 1996b:42-45; 1997b:8-14; n.d. a; n.d. b; n.d. c; Hester n.d.).

The occurrence of marine shell ornaments in isolated instances in occupation sites raises conjecture as to why they were there. Since the known prehistoric burials and cemetery sites in the reservoir are all located in occupation sites, it is possible that isolate ornamental artifacts have simply eroded (and perhaps been further displaced by wave action) from burials located in relative proximity. It is also possible that the artifacts represent ornaments dropped or lost in the sites, or set aside for later use (and ultimately not recovered).

The reported artifacts were recovered from six different sites in the reservoir. Five of these sites are located in the Mexican state of Tamaulipas. The remaining site is located in west central Zapata County, Texas (see Figure 2). Four of the six sites exhibited artifacts dating from the Archaic period through the Late Prehistoric; two of the sites had no evident post-Archaic component, and two of the six


**Figure 1. Area map (Texas and Mexico), showing location of Falcon Reservoir, near center of the map.**

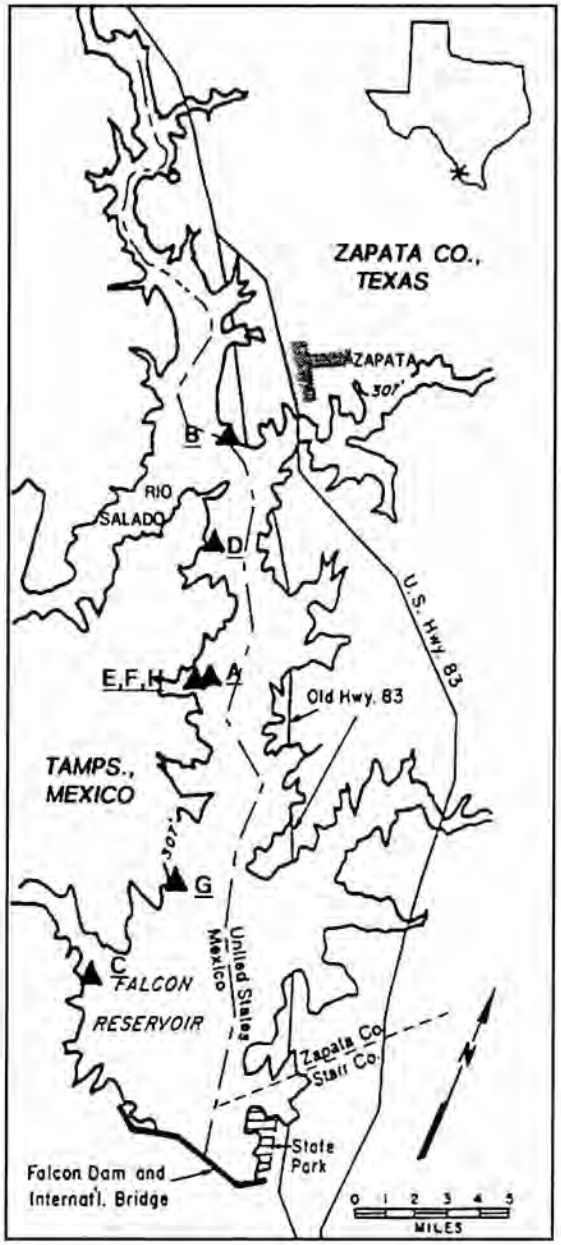


**Figure 2. Map of Falcon Reservoir, showing sites where the isolate marine shell artifacts were recovered. Letter designations correspond with specimen numbers in text. Site B is the only U.S. site; three of the eight artifacts were recovered at site E,F,H.**

sites yielded artifacts from the Paleoindian period (Boyd n.d. a). Interestingly, burials were recorded in three of the sites (ibid.). It is possible that burials are present in the other three sites, but none were recorded by the author.

Numbers of additional marine shell ornaments as isolate finds have been recorded in areas adjacent to Falcon Reservoir, on both the U.S. and Mexican sides (Boyd 1997a:47-50; n.d. a). These artifacts are not discussed here since the respective sites are above the conservation pool area of the reservoir. Several of the sites are located on high terraces of the Rio Salado, which flows into the lake just southwest of Zapata, Texas (see Figure 2).

## THE ARTIFACTS

***Shell pendant.*** A single ornament classifiable as a small pendant is included (see Figure 3A). This artifact was found on May 24, 1995 at a large site on the Mexican side of the lake (see Figure 2, A). The site is located in the Arroyo Centurion, approximately 16 kilometers south-southwest of Zapata, Texas. This site yielded artifacts, e.g., projectile points, datable mainly to the Archaic period (Boyd n.d. a). Very few, if any, arrow points were found. Three burials were recorded in this site (Boyd and Wilson 1998:11-15; Boyd n.d. d). On the discovery date the elevation of Falcon Reservoir was 262.5 amsl (International Boundary Water Commission [IBWC], personal communication 1995).

The pendant appears to be made from a portion of the body whorl of a conch shell. The dimensions of the artifact are presented in Table 1. The pendant is generally square at one end, and tapers to a point at the other end. There is a biconically drilled hole near the pointed end of the artifact. The slanting upper edge of the pendant appears to be generally unaltered; it is apparently the outer lip of the original parent shell. The remaining edges of the artifact are perpendicularly cut, apparently by the *groove and snap* technique. The edges appear to have been subsequently smoothed. The surface of the artifact is weathered in appearance. The internal face exhibits a slight gloss, retained from the original parent shell, as well as two parallel rows of shallow, drilled pits (see Figure 3, A and Figure 4). There are six distinct pits in the upper row, and six in the lower, which is irregular.

***Large oval-shaped shell bead.*** One artifact classifiable as a large oval-shaped bead is included (see Figure 3, B). This ornament was found on June

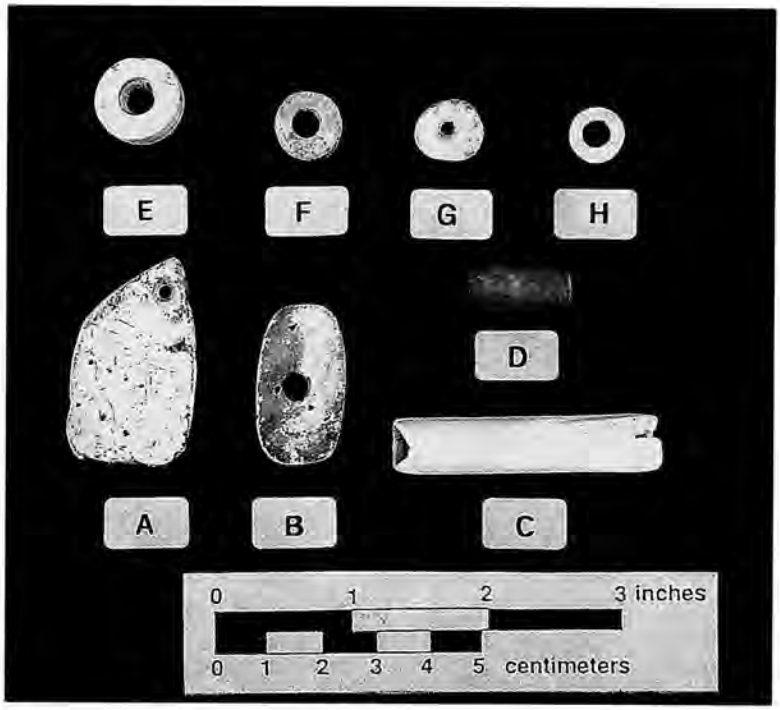


**Figure 3. Photograph of the marine shell artifacts (isolate finds). A, pendant; B, large oval-shaped bead; C, tubular bead; D, tubular bead blank; E-H, disc-shaped shell beads. Specimens E, F, and H are from the same site (Gull Island). All specimens are apparently made from conch, with the exception of Specimen 3B. Photograph by the author.**

8, 1990 in a small site in Zapata County, Texas, and represents the only marine shell ornament in the sampling from the U.S. side of the reservoir (see Figure 2, B). The site is located on a small terrace of the Rio Grande, below a high sandstone outcropping of lower Tertiary age. It yielded projectile points dating from the Archaic through the Late Prehistoric period(s). The site was previously recorded as 41ZP6, and is located approximately five kilometers southwest of Zapata, Texas. Although no burials were recorded in the site, a single bone bead was recovered there (Boyd n.d. a). Bone beads are commonly found as mortuary inclusions with burials in the Falcon Reservoir (cf. Boyd 1996a:13-17; 1996b:42-45). The presence of the marine shell bead as well as the bone bead seems to indicate, based on the context in which such artifacts are often found, that burials are present in this site. The presence of two identified prehistoric cemetery sites (41ZP7 and 41ZP8) [cf Boyd et al.1997:418-419; Boyd n.d. b]) in immediate proximity to the site furthers the contention that burials may be present there, especially since the three sites are located on similar landforms. The lake elevation was 278.13 ft. amsl when the bead was recovered.

The bead appears to be made from a section of shell with several natural, irregularly shaped pits on both faces. The shell type does not appear to be conch. Dimensions are given in Table 1. The shape of the bead is generally oval in outline, and there is a biconically drilled hole near the center. The interior edges of the suspension hole are well rounded in appearance, as are all edges of the artifact. The surface of the bead is moderately weathered in appearance.

***Tubular shell bead.*** One artifact classifiable as a tubular shell bead is included (see Figure 3, C). This ornament was found on June 16, 1984 in a large

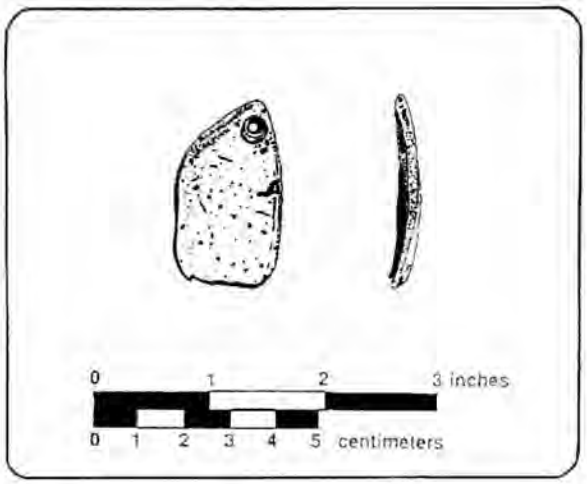


**Figure 4. Drawing of the marine shell pendant, an isolate find. Frontal and side view. Note the two parallel rows of drilled pits on the face of the artifact (see also Figure 3A.) Drawing by the author.**

occupation site on the Mexican side of the lake (see Figure 2, C). The site is located in the Arroyo Salinillas, approximately 30 kilometers south of Zapata, Texas. This site yielded projectile points dating from the Paleoindian through the Archaic period (Boyd n.d.a). No burials were recorded in the site, which lies on the south bank of the referenced arroyo. The elevation of the lake was approximately 268.5 ft. amsl when the artifact was recovered.

The tubular bead is apparently made from the columella of a conch shell. The dimensions of the artifact are listed in Table 1. The specimen is drilled from both ends, and concentric grinding marks are evident in both drilled ends. The edges of both ends have been ground, and are generally rounded in appearance. The drilled holes taper toward the center of the artifact, so that the center hole diameter is less than half that near the end(s) of the specimen. The surface of the bead is chalky white in appearance.

***Tubular shell bead blank.*** One artifact classifiable as a tubular shell bead blank is included (see Figure 3, D). The artifact was found on August 31, 1995 in a very large occupation/prehistoric cemetery site located on the Tamaulipas side of the reservoir (see Figure 2D). The site, known as Southern Island, is located at the north edge of the Arroyo Diablo, approximately eight kilometers south of Zapata, Texas. This site has yielded projectile points spanning the entire range of human history in the area, from the Paleoindian period (Hester 1995: 434) through the Late Prehistoric (Boyd n.d. a). The site is located on a large, preserved section of the Zapata terrace as described by Evans (1961:39), and numerous burials have been recorded there (cf. Boyd et al. 1997; Boyd n.d. a; n.d. b). When the tubular bead blank was found, the elevation of Falcon Reservoir was approximately 258.7 ft. amsl.

The bead blank is apparently made from the columella of a conch shell. The dimensions of the artifact are presented in Table 1. The specimen is small and cylindrical in shape, and has a single conically-shaped drilled hole in one end to a depth of 2.8 mm. The other end is undrilled. The body of the specimen is round in cross section, and is moderately weathered in appearance. The artifact is tan in color.

***Disc-shaped shell beads.*** Four artifacts classifiable as disc-shaped shell beads are included in the assemblage (see Figures 3E-3H). Three of the artifacts (3E, 3F, and 3H) are from the same site on the Tamaulipas side of the lake, approximately 16 kilometers south-southwest of Zapata, Texas. This site is on the south bank of the Arroyo Centurion (see Figure 2E, F, H). The site, known locally as Gull Island, has yielded projectile points dating from the Archaic period through the Late Prehistoric, as well as at least one burial (Boyd n.d. a). Specimen 3E was found on January 30, 1986 (lake elevation 269.91 ft. amsl); Specimen 3F was found on July 4, 1990 (lake elevation approximately 273.45 ft. amsl); Specimen 3H was found on April 21, 1995 (lake elevation 271.69 ft. amsl). The fourth shell bead (see Figure 3G) was found in an occupation site on the Mexican side of the lake, approximately 26 kilometers south of Zapata, Texas (see Figure 2G). The site is located on a high terrace of the Rio Grande, just north of the Arroyo Benavides. This site yielded projectile points dating from the Archaic through the Late Prehistoric period (Boyd n.d.a). No burials were recorded there. When the bead was found (February 10, 1990), the elevation of Falcon Reservoir was approximately 276.85 ft. amsl.

The beads are all generally circular in shape; Specimen 3 G is slightly irregular. The dimensions of

each bead is given in Table 1. The largest bead is specimen 3E. The bead is conically drilled and exhibits a minimum degree of weathering. The edges are perpendicular to the face(s), and the corners are slightly rounded or ground. The reverse face of the artifact is unusual in that half of the face has been transversely cut away, so that one edge of the bead is 6.05 mm in thickness, while the other edge is only 4.30 mm in thickness. The bead exhibits a light polish or gloss on the surface. It, along with the other disc-shaped shell beads, appears to be made from conch. Specimen 3 F is the second largest disc-shaped shell bead. This relatively thick bead has perpendicular edges, and the centrally drilled hole has perpendicular (to the face of the specimen) edges. The surface of the bead is somewhat rough and weathered in appearance under magnification, and exhibits a light salmon color. Specimen 3 G is the third largest circular shell bead, and exhibits a biconically drilled hole which is slightly offset from center. The specimen has rounded edges and a rough, weathered surface. Whereas the obverse face is relatively flat in appearance, the reverse side is quite irregular. Specimen 3H, the smallest bead, exhibits a biconically drilled central hole, rounded edges, and a glossy appearance under slight magnification. Weathering, if any, is minimal, and there are several parallel incised lines on both faces of the bead which are visible under magnification.

**Table 1. Specifications of Marine Shell Ornaments**

| Spec. No.* | Max. Length | Max. Width | Max. Thickness | Hole Diameter |
|---|---|---|---|---|
| 3A | 3.96 cm | 2.38 cm | 0.22 cm | 0.22 cm |
| 3B | 3.05 cm | 1.69 cm | 0.22 cm | 0.51 cm |
| 3C | 5.01 cm | 1.13 cm | ** | 0.65 cm *** |
| 3D | 1.93 cm | 0.90 cm | ** | 0.32 cm |
| 3E | **** | 1.68 cm | 0.61 cm | 0.51 cm |
| 3F | **** | 1.31 cm | 0.54 cm | 0.50 cm |
| 3G | **** | 1.33 cm | 0.41 cm | 0.23 cm |
| 3H | **** | 1.07 cm | 0.23 cm | 0.53 cm |

* specimen numbers correlate with Figure 3 and text
**Measurement same as MAX.WIDTH
***Same diameter at both ends
****N/A (see MAX.WIDTH)

All measurements taken with *MITUTOYO CD-6"* BS DIGIMATIC CALIPER
(Measurements converted from mm to cm).

## CONCLUSION

Solitary finds of marine shell ornaments in the numerous sites located in the conservation pool area of Falcon Reservoir are rare occurrences. The inclusion of marine shell ornaments as grave goods is common in the same geographic area. Solitary finds of such ornaments certainly, in some cases, represents artifacts which have washed or eroded out of burials. Erosion, in the form of wave action, compounded by fluctuating water levels at the reservoir, is quite pronounced and has an adverse effect on sites in the conservation pool area. The possibility that some of the isolate finds may represent lost or cached ornaments also has to be considered. When considering the distance between the source of the shell used to manufacture the ornaments (the Brownsville Complex) and the Falcon Reservoir area, some 130-240 km, it seems likely that marine shell ornaments would have been highly prized possessions and would have

been carefully accounted for, e.g., as mortuary inclusions. The question as to whether the marine shell ornaments found in the Falcon Reservoir district were manufactured in the Brownsville Complex geographic area and were traded or transported to the Falcon area, or were actually manufactured (from raw shell material) in the Falcon Reservoir area itself currently remains unanswered. There is some evidence that the actual manufacture of shell ornaments from raw marine shell was performed to some degree in the Falcon area. This evidence consists of several specimens of core marine shell artifacts recovered in the area which exhibit signs that sections have been removed/cut from the parent specimen. Future work in the area may resolve this, and many other, still unanswered questions regarding the archaeology of the Falcon Reservoir area.

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# *A POLYHEDRAL CORE FROM NORTHEAST SAN ANTONIO*

*C. K. Chandler*

## ABSTRACT

*A single polyhedral core from the Encino Park area of northeast San Antonio is described and illustrated.*

## ARTIFACT DESCRIPTION

This core is illustrated with four views in Figures 1 and 2. It is rather short in length and large in diameter. Dimensions are 138 mm in diameter across the large, flat proximal face and 67 mm in diameter across the smaller distal end. It varies in length from 65 to 80 mm and weighs 1293 grams. Both ends are flat and are without short maintenance flakes around the core perimeter. Both ends are single faceted, without cortex and have no evidence of preparation as striking platforms. About one-half of the large striking platform had a smooth natural crack and most of the flakes were discharged from this area of the core. The rest of the core is very coarse and grainy and appears unsuitable for flaking.

Eleven flakes have been discharged from the large natural platform. Only one of these is full length of the core. Two flakes were struck from the smaller distal end and one of these is nearly full length of the core. Both ends of the core exhibit alternating bands much like growth rings on a tree.

The one full length flake is 76 mm long and 43 mm wide. Flakes 2, 3, 4, 6, 7, 9, 10, and 11 all hinged off short of previous cortex removal flakes. Cortex remains on the core face below the hinged off flakes and full length of the core where no flakes were discharged.

All of the discharged flakes have varying degrees of negative bulbs of percussion. None of the flakes left straight, parallel blade edge scars. Flake scars range from 25 to 86 mm in length and 14 to 23 mm in width. Only four of the flake scars have ripples. This core is semi-conical in shape and the remaining cortex indicates that is its natural shape.

## DISCUSSION

This core is unlike previous polyhedral blade cores reported from the San Antonio area. The previous cores have been considered to be of Clovis age or affiliation (Chandler 1992; Collins and Headrick 1992; Kelly 1992; Houk et al. 1997). The Encino Park core reported in this paper is much shorter than the Clovis age specimens and is of inferior quality material. It is without patina. Overall, it is light tannish gray in color.

This core is of Late Prehistoric age (Toyah). It was found by Dan Davis on the surface in Encino Park where he and his family lived in northeast San Antonio. It was disposed of in a garage sale after Dan's death. The neighbor lady who bought it took it to the Witte Museum in an effort to find out what she had. Roberta McGregor referred her to me. The artifact was marked in black ink with 41BXEP which immediately told me that someone familiar with archaeology had marked it. Knowing that Dan had been a long time friend of Rusty Vereen, I asked him about the identification on the core. He told me that was Dan's identification for artifacts found in the area where he lived. Problem solved.

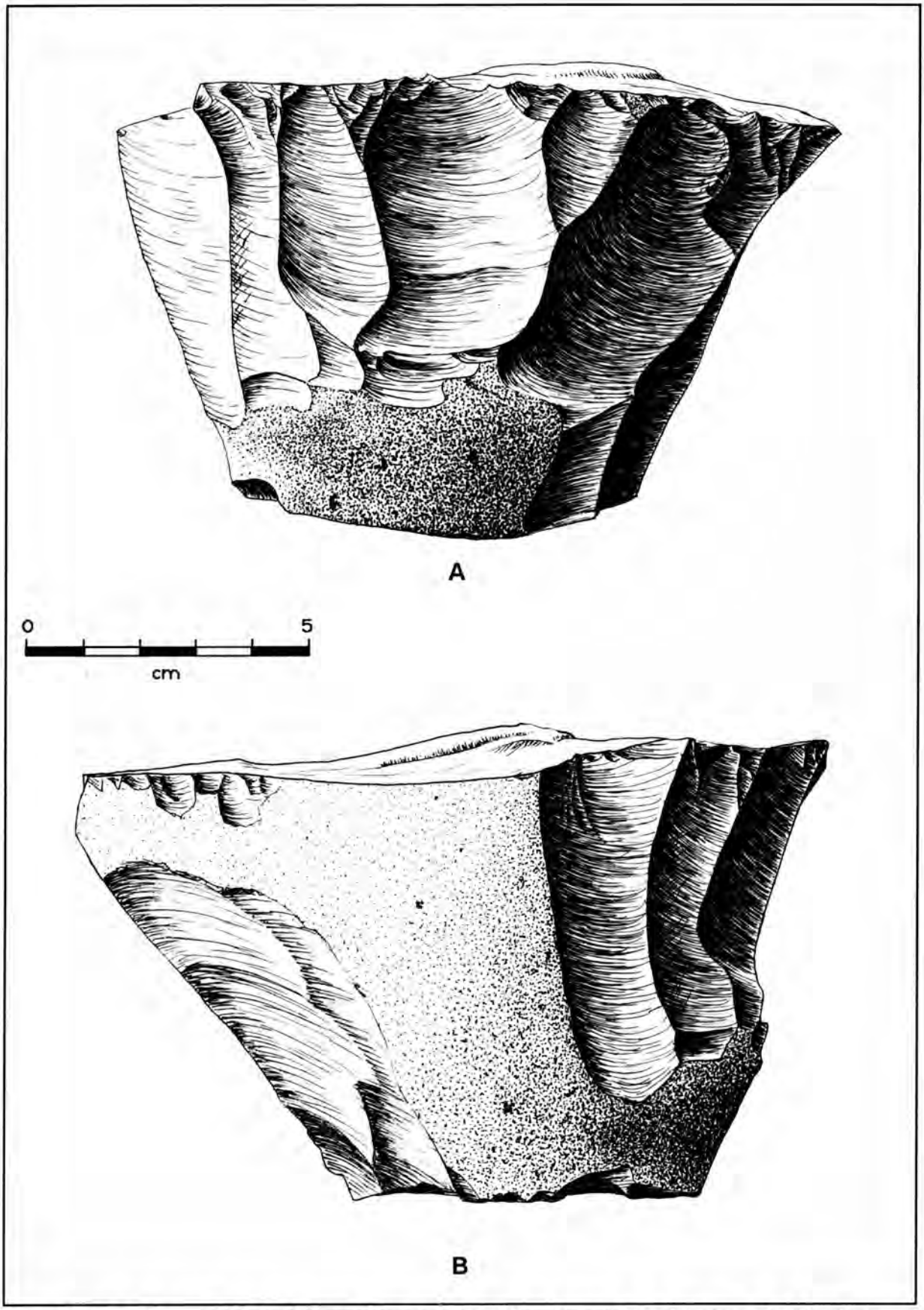


**Figure 1. Two views of polyhedral core from northeast San Antonio. A, side view; B, side view.**

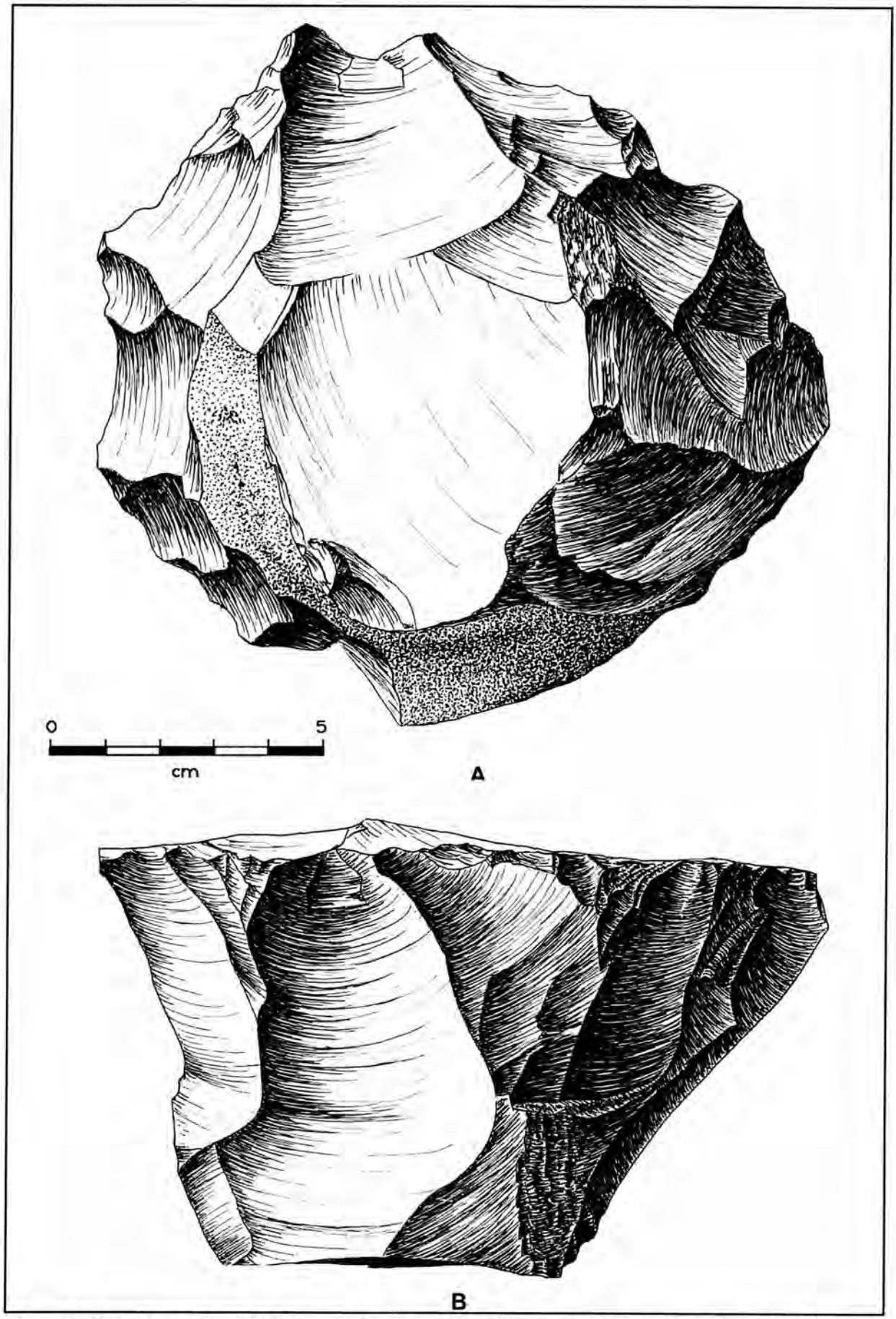


**Figure 2. Two views of polyhedral core from northeast San Antonio. A, bottom view; B, Side view.**

## ACKNOWLEDGMENTS

Sincere thanks are extended to Holly Carp for the loan of this core for documentation and study, and to Rusty Vereen for his part in determining where it was found. Special thanks to Richard McReynolds who prepared the illustrations.

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# *FOLSOM POINT REPORTED FROM HINDS CAVE PROBABLY IS NOT FROM HINDS CAVE*

*Michael B. Collins*

## ABSTRACT

*A Folsom point previously reported in* La Tierra *as having been found in Hinds Cave (41VV456) in Val Verde County in the 1960s was actually found in Blanco County some 30 years earlier, according to records on file at the Texas Archeological Research Laboratory at The University of Texas at Austin.*

## BACKGROUND

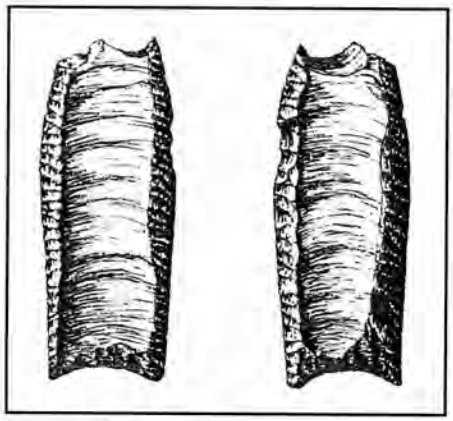
Ten years ago in the pages of *La Tierra* a very distinctive, almost complete Folsom point was reported as having been found in Hinds Cave (41VV456) in Val Verde County, Texas (Bement and Turpin 1988:5-7). In their account, the authors present information provided to them by an unnamed individual who was in possession of the Folsom point at the time the article was written. This information was not very precise, indicating only that the point had been recovered from "deep in the deposits, in a small chamber extending into the back wall of the shelter" some time in the "1960s" (ibid:5). Hinds Cave (see Figure 1) was intensively investigated in the 1970s by archaeologists from Texas A&M University (TAMU) (Shafer and Bryant 1977). The small chamber reportedly yielding the Folsom point was inferred by Bement and Turpin (1988:5) to correspond to the alcove in Area G of Hinds Cave as the site was described by the TAMU archaeologists.

As Bement and Turpin (1988:5-6) indicate, a Folsom point securely provenienced from an occupied shelter in the Lower Pecos region would be highly significant, as only one other tightly provenienced Folsom Point, from Bone Bed 2 at Bonfire Shelter, a bison kill site (Dibble and Lorrain 1968), is reported from the area. The find also seemed especially significant in light of its possible association with bones of extinct horse documented in Hinds Cave by the TAMU excavation (Shafer and Bryant 1977; Lord 1984).

## ARTIFACT DESCRIPTION

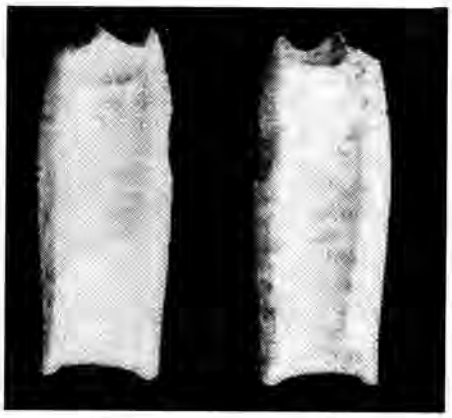
Both faces of this point were illustrated with photographs in the article (Bement and Turpin 1988: Figure 2, page 6) and with excellent line drawings by Richard McReynolds on the cover of the journal (*La Tierra*, Volume 15, Number 1:Cover). In both of these illustrations published in 1988, several distinctive attributes of the point are clearly visible. These attributes (Figure 2) are: (1) the fluting sequence discernible from the channel flake scars and the pattern of basal retouch; (2) very fine pressure flaking on both edges of both faces; (3) asymmetry of the flute on one face; and (4) a peculiar scalloped fracture at the tip. Another attribute that is not readily apparent in the illustrations is reported in the text: "a uniform white patina obscures the naturally translucent tan chert from which the point was formed" (ibid:6). This combination of features is so distinctive that this point could never be confused with any other Folsom point. Bement and Turpin (1988:6) report the specimen to be 4.6 cm long, 1.9 cm wide, and 0.3 cm thick.


**Figure 1. Location of Hinds Cave and the Folsom find spot according to Stephenson.**



a b

**Figure 2. Richard McReynold's 1988 drawing of the Folsom point. a, obverse face; b, reverse face. (Courtesy *La Tierra* and R. McReynolds.)**



a b

**Figure 3. Folsom point documented in 1949 by R. L. Stephenson as having been found in Blanco County, approximately 5 miles southeast of Johnson City, Texas. a, obverse face; b, reverse face. (Photographs from TARL files.)**

While searching the archaeological records for Blanco County on file at the Texas Archeological Research Laboratory (TARL) at the University of Texas at Austin, I recently came across two old photographs unmistakably of the two faces of this same Folsom Point (Figure 3). Information accompanying the photographs and in the site files indicates that the point was found in Blanco County some 3.5 or 4 miles west northwest of the Scott Cooley site (41BC20), southeast of Johnson City (see Figure 1). It is further noted in the TARL files that it had been found in 1934 or 1935 and that it was documented in 1949 by the late R. L. Stephenson, then of the River Basin Surveys. It was owned by Dr. C. L. Baskett of Del Rio, according to these files. The patination reported on this specimen is certainly more consistent with the Stephenson account of it having been found in an open site than the later account of it having been protected inside a rockshelter.

Unfortunately, the negatives of the 1949 photographs are missing and the prints on file are small and badly overexposed. The accompanying illustration (Figure 3) was made by copying the overexposed prints on file, and it doesn't yield much detail, but the distinguishing characteristics of the specimen are visible, nonetheless. This plate is composed with the same placement of the two faces as in the 1988 illustrations. In all three figures (Figures 2 and 3 in this article, Figure 2 in Bement and Turpin, 1988, and the cover of *La Tierra* Volume 15, Number 1) the view to the left (Figure 2a) is the face with the first flute to be removed from the point (referred to hereafter as "obverse") and the view to the right (Figure 2b) illustrates the face with the second flute ("reverse").

Note that the flute on the obverse is well centered on the point, or, technically, the point is well centered on the flute, since final edge trimming is done after fluting and the knapper has the opportunity to trim the edges into symmetry around the flute. The parallel edges of the flute on the obverse indicate that it originated from a platform some distance below the present basal edge of the point. In contrast, the edges of the flute on the reverse converge near the base of the point, which indicates that the fluting platform was very close to the present basal edge. These flake scar patterns suggest the following sequence: the knapper (1) detached the obverse flute from a preform, trimmed away the damaged platform from that removal and prepared a second platform for fluting the reverse face, (2) then detached the second flute from the slightly shortened preform, and (3) then trimmed the tip, lateral edges, and basal edges as symmetrically as possible around the two flutes. This trimming was done by the removal of very regular, closely spaced pressure flakes. In spite of the knap-

per's effort, the second flute (Figure 2b) remained slightly off center to the left. The point was then used and the distal end was damaged, evidently by impact. The impact break on the tip consists of two fractures, one terminating on each face of the point and giving a scalloped appearance to the distal end of the specimen (Figures 2 and 3).

## DISCUSSION

When the distribution of Folsom points in Texas was recently scrutinized, it became apparent that comparatively few have been reported for the interior of the Edwards Plateau and the Central Mineral regions (Largent and Waters 1990; Largent et al. 1991). The location of this Folsom specimen as recorded by Stephenson would place it on the Plateau but just a short distance from the southeastern edge of the Central Mineral Region. This location is as noteworthy as a location in the Lower Pecos in terms of the scarcity of Folsom points in both areas. The weight of evidence also suggests that of the two proveniences attributed to this specimen, the one in Blanco County is more credible than is the one in Hinds Cave.

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# *REWORKED GUADALUPE TOOLS FROM THE TSCHOEPE-HARBORTH SITE*

*Kenneth M. Brown*

## ABSTRACT

*Two Guadalupe tools collected from the surface of the Tschoepe-Harborth site in Guadalupe County are described. These are only two of many known from the site, but they bear unusual evidence of haft reworking that is not often seen on exhausted Guadalupe tools.*

## INTRODUCTION

The Tschoepe-Harborth site (41GU17) is situated on Geronimo Creek, near Geronimo in Guadalupe County. It has been under cultivation since at least the 1920s, and both the landowners and Bob Everett have made extensive surface collections that include many Guadalupe tools (Everett n.d.). Mr. Everett has called to my attention and has kindly loaned for study two surface-collected specimens. These are just two of many Guadalupe tools known from the site, but the haft reworking seen on both these specimens is unusual, and perhaps worth documenting. The specimens were photographed and, after gentle washing with soap and water, were examined under low power (10-70X) magnification with a stereozoom binocular microscope. They were measured with dial calipers with a 0.1 mm resolution, and both the measurements listed in Table 1 and the terms for tool landmarks follow the scheme proposed in my paper on Guadalupe tool caches (Brown 1985:82-83). See that paper for an explanation of terminology. Catalog numbers are those assigned by Mr. Everett.

It is quite commonplace to find reworked, shock-damaged, or exhausted specimens in collections of Guadalupe tools from South Texas. Reworking commonly involves repeated bit-trimming and narrowing, steepened bit edge angles with concomitantly frequent dorsal step-fracturing, overall shortening of tool length, loss of weight, and pronounced bit asymmetry. In-haft shock damage often produces plunging fractures that travel from the dorsal ridge to the ventral face. Modification of lateral edges after initial production is, however, quite rare. The lateral edges of most specimens bear extensive edge crushing, battering, and grinding left from the original manufacture of the tool, but one seldom sees any evidence of further modification here during the use-life of the tool. Instead, as we might expect, it is the working end that suffers most evolutionary change during the life of the tool. The specimens described here are unusual because they bear evidence of both bit and lateral edge reworking.

**Specimen 120 (Figure 1: A, B, C)**

This specimen is made of variegated light gray-brown to beige chert and is quite symmetrical. The ventral side is well-flattened by shallow flake scars that reach or exceed the midline. No cortex is present anywhere. Most of the bit facet has been removed by dorsal bit trimming, but the part that remains appears rather heavily dished. Both lateral edges appear to have been reworked, but the right side (when viewed dorsally) has been rechipped so much that it is recessed about a centimeter just behind the bit. The lateral edges show some battering but very little evidence of rounding. Only a few projections show any evidence of light to moderate grinding.

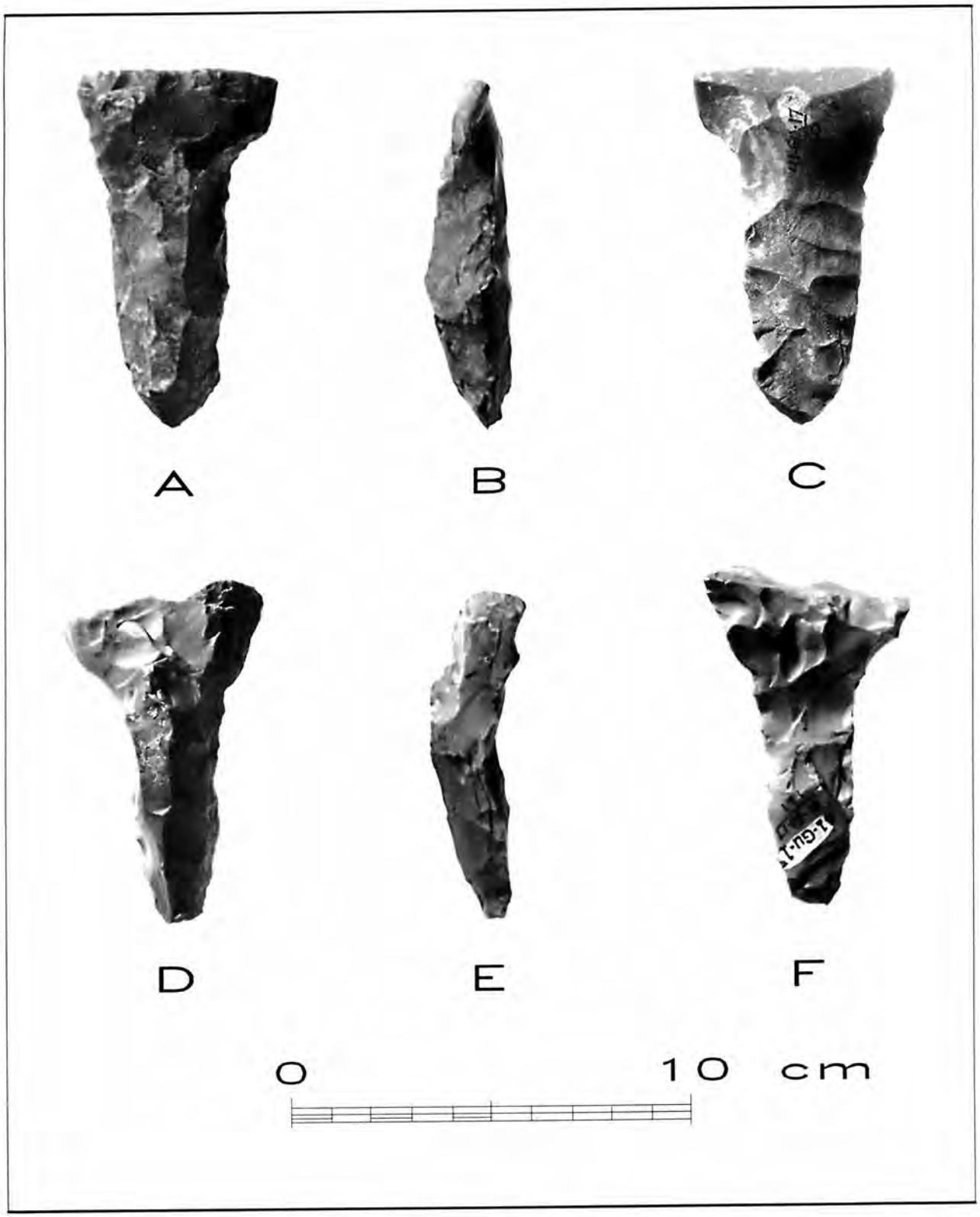


**Figure 1. Reworked Guadalupe tools.** A, Specimen 120, dorsal face; B, Specimen 120, side view (dorsal face to left); C, Specimen 120, ventral face; D, Specimen 121, dorsal face; E, Specimen 121, side view (dorsal face to left); F, Specimen 121, ventral face. Distal (bit) end is at top of illustration.

**Table 1. Metric Attributes: Reworked Guadalupe Tools from the Tschoepe-Harborth Site.***

| | Specimen 120 | Specimen 121 |
|---|---|---|
| **Dorsal length (mm)** | **94.7** | **98.3** |
| **Ventral length (mm)** | **85.8** | **78.1** |
| **Maximum bit width (mm)** | **51.6** | **53.0** |
| **Maximum tool width (mm)** | **52.5** | **53.0** |
| **Maximum tool thickness (mm)** | **24.1** | **19.4** |
| **Bit thickness (mm)** | **11.1** | **15.7** |
| **Maximum depth of bit concavity (mm)** | **3.3** | **2.9** |
| **Bit facet/ventral angle (degrees)** | **141** | **114** |
| **Bit-spine plane angle (degrees)** | **56** | **64** |
| **Weight (grams)** | **80.09** | **62.60** |

*** See Brown (1985) for definitions of terms.**

The bit facet may perhaps have some very light, evenly distributed polish, but it is not at all well developed. On the dorsal side, a ridge (left by step-fracturing of edge-trimming flakes) has a small area of pronounced polish about 2 mm across and 2.5 mm back from the working edge (Fig. 2). The polish is best developed near the leading edge of the ridge and diminishes away from it. No other significant areas of polish are visible at 10-70X. The bit facet has a few very shallow, wide, invasive flake scars extending as much as 2.2 mm from the edge. These could be due either to use or resharpening. The bit edge itself is quite sharp and does not appear to have been used after its last resharpening. Part of the edge shows very small trimming scars (2 mm or more wide, generally less than 1 mm long), probably produced when a percussor was used to rake the edge in order to even it and remove projections.

**Specimen 121 (Figure 1: D, E, F)**

This specimen is made of homogeneous, light gray-brown chert with carbonate deposits (pedogenic?) adhering to the dorsal side, and rust marks, evidently from plow contact, on the ventral side. No cortex is present anywhere. Two low flake scar ridges on the ventral side, about a third of the way from the proximal end, are heavily battered, either from plow contact or possibly from hammerstone battering in an attempt to reduce the height or sharpness of the ridge. This specimen is less well made than the other and has been extensively and crudely reworked by heavy hard-hammer percussion. Presumably as a result of reworking, the bit edge is now canted about 13° to the left in relation to the long axis of the tool, when viewed dorsally. The bit facet bears one deep, wide flake scar (9.2 mm long, 8.6 mm wide) with extensive edge crushing at the point of impact. Perhaps 2-3 smaller flake scars are inset into this one and indicate further percussor impact at about the same spot. It is unclear whether this represents plow damage (there is no rust staining), use wear, or a failed attempt to rework the bit facet.

This tool shows a great deal of battering and hard-hammer reworking from relatively steep edges, resulting in extensive step- and hinge-fracturing, with deeply furrowed, short flake scars. The dorsal ridge has some limited battering, and the proximal end has some unresolved ring fractures. The lateral edges are battered but essentially show no evidence of grinding. The dorsal face has a few scattered glossy spots, but otherwise no polish.

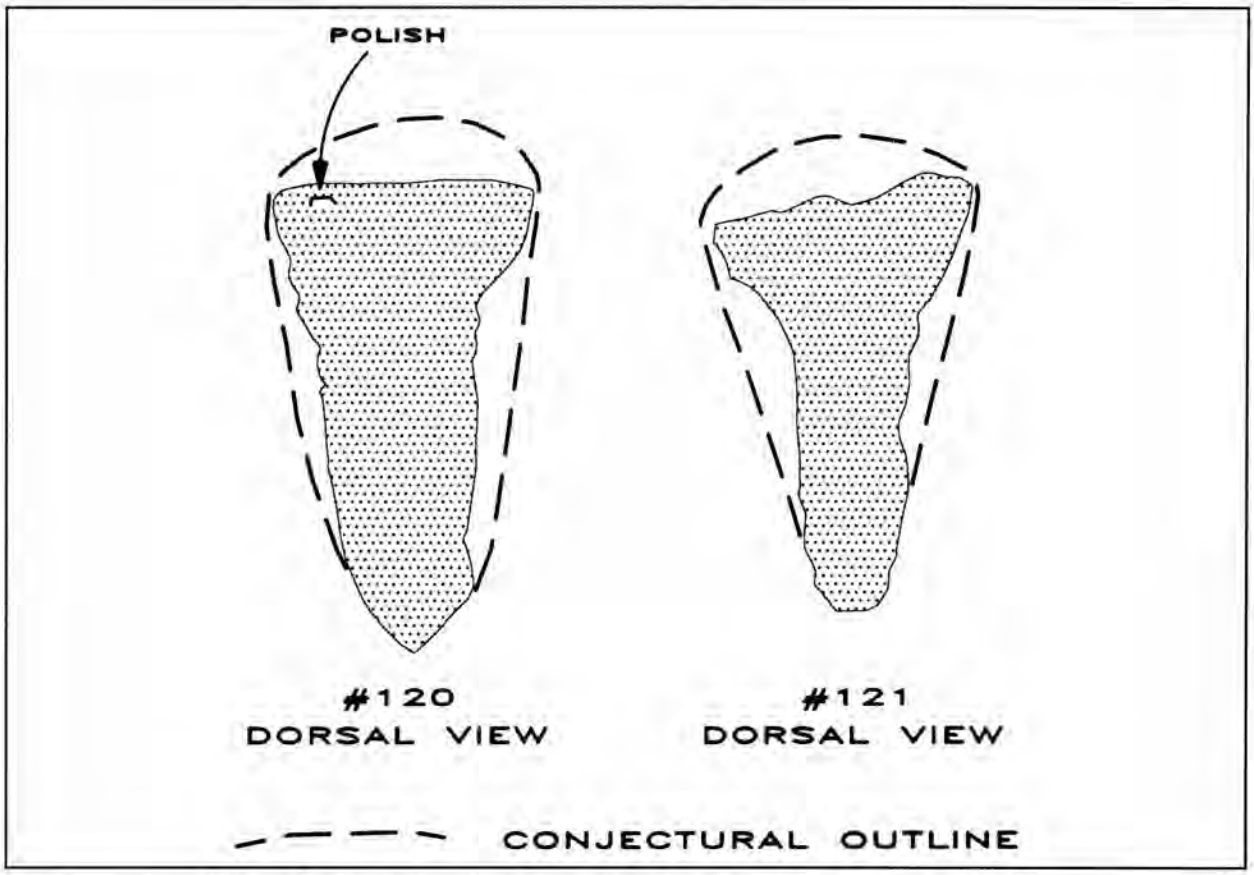


**Figure 2. Conjectural configuration before reworking.** This sketch shows what the original shape of the tools might have looked like, as well as the location of the small patch of polish on Specimen 120.

## DISCUSSION

The bits on both of these tools are somewhat wider (over 5 cm) than the norm (about 3.0-3.7 cm) for most Guadalupe tools, but otherwise must have been close to the metric norm before reworking. Both tools have had so much mass removed from the bit and haft areas that they are somewhat lighter (80.1 and 62.6 g) respectively, than most Guadalupe tools, which usually weigh over 100 grams. Both have been extensively reworked on the bit, and in both cases the bit facet has been narrowed to the point that the effective use-life of the tool is essentially near its end. Specimen 121 appears to have had some limited use after its last resharpening, but Specimen 120 has a pristine working edge that does not seem to have been used after it was last retouched.

Judging by their outlines, both tools have had their lateral haft edges narrowed to a width of about 3 cm (by hard-hammer rechipping) from the original configuration. The heavy edge grinding usually seen on the lateral edges (presumably to prevent tool movement in the haft from cutting the binding element) was not restored after edge narrowing. I can think of no possible motive for narrowing the haft element except to refit the tool to a new wooden haft that was narrower than the original. Perhaps the original haft broke during use, and both tools were refitted to a new haft that was only about 3 cm wide or narrower. The similarity in width of the two specimens makes it tempting to speculate that both might have been fitted to the same haft at different times. Perhaps the absence of edge grinding shows the user recognized these tools had little useful life remaining.

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# *THE ELIZABETH STAHA HUGHES COLLECTION OF LITHIC ARTIFACTS FROM THE TEXAS HILL COUNTRY*

*Norman G. Flaigg*

## ABSTRACT

*The Elizabeth Staha Hughes collection, recovered in 1930 and consisting of 60 lithic artifacts, was donated to the Texas Historical Commission on February 19, 1992, by Matt Hughes of Nova Scotia, Canada. The artifacts were reportedly found in a cave or shelter, most likely in the Texas Hill Country, in cachelike circumstances. Most of the artifacts are dart points representing the entire range of the Archaic period and associated with the use of the atlatl. The collection also contains arrow points indicative of Late Prehistoric use of the bow and arrow. This report documents the acquisition of the collection, explains the study of the collection, describes the artifacts, and discusses the significance of the collection.*

## INTRODUCTION

The Elizabeth Staha Hughes collection was donated to the Texas Historical Commission on February 19, 1992, by Matt Hughes of Nova Scotia, Canada. It consists of 60 lithic artifacts mounted in six 9 x 14 in. black-velvet-covered frames. It reportedly is one-half of a collection that came from a cave located either in the Central Texas Hill Country or in the Big Bend area.

The specific circumstances of the find are unclear. Elizabeth Staha, in the company of her father and a man named John Eross, reportedly were exploring caves or shelters sometime early in 1930. According to one account, Staha, as a 12-year-old girl, crawled through a small opening into a cave where she found all the points together.

According to another account the girl was lowered into a shaft that angled downward at the back of a shelter. There she found some of the points clustered together on the surface. She dug additional artifacts. Unfortunately, no provenience is available for any of these points. In addition, it is not known which points were found on the surface and which were excavated.

One-half of the collection was reported to have been donated to the Witte Museum in San Antonio. However, inquiry made of the curator of the Witte Museum about a collection that may have been named for Eross, Hughes, or Staha failed to substantiate this report (Roberta MacGregor, personal communication, 1995). The location of the other half of the collection (if it exists) remains unknown.

## METHOD OF STUDY

The artifacts were removed from their frames and labeled with the initials ESH, identifying the donor, followed by two numbers that represent the frame from which the artifact was removed and the order of the artifact on the frame. For example, first artifact from the first frame is numbered ESH 1-1.

The artifacts were sorted and compared to published projectile-point type descriptions for classification. Each point was measured, weighed and inspected to determine material type, heat-treatment, beveling, grinding, serration, and any other notable characteristic. Generally measurements were made with the reverse side up, the obverse face being the catalogued face.

Stem-width dimensions were determined by measuring the base at the widest point on specimens with expanding stems and at the base on specimens with rectangular stems. Neck widths on points with contracting stems were taken at a point where there was a noticeable flare toward the shoulders or barbs. Stem length on notched and barbed specimens was measured at the greatest distance between the base and the notch. On shouldered or contracting-stem specimens, the stem length was taken at the point where a noticeable flare toward the shoulders or barbs began.

In the interest of brevity, blade shapes are not described in detail, since that information is provided in the figures. Detailed analysis of notches was not

done because many of the points are stemmed types and many, including arrow points, have damaged bases that make such measurement impossible.

## DESCRIPTION OF THE ARTIFACTS

The collection includes 60 lithic artifacts: 51 dart points, 4 arrow points, 1 flake, and 4 thin bifaces. Two of the thin bifaces were probably used as knives. The dart points are discussed by type, in alphabetical order, followed by discussions of the arrow points. Descriptions of the large bifaces and the flake follow those of the projectile points. As mentioned earlier, the catalogue numbers relate to the original mounts.

### DART POINTS

**Castroville (n = 5).** The Castroville type is typically a medium to large dart point with a large triangular blade having straight to mildly convex lateral edges. The Castroville point usually has strong barbs formed by notching from the base and has a broad stem with straight edges and base; base and stem edges are unsmoothed. These points are found primarily at Late Archaic (ca. 800-400 B.C.) sites in Central Texas (Turner and Hester 1993:86). Dimensions and weights of the Castroville points in the collection are given in Table 1, and the specimens are illustrated in Figure 1.

All of the Castroville points in this collection are made of Edwards Plateau chert in varying shades of gray and brown. All but ESH 2-2 appear to be thermally altered. None exhibits any beveling, serration, or basal or stem edge grinding. All of the stems are short and expanding.

ESH 2-2 is missing both barbs but its configuration generally fits that of the Castroville type. It is well made and has a very sharp point. The blade edges, stem edges, and base are all straight.

ESH 2-3 is a well-made specimen with slightly convex blade edges and a straight base. The shoulders are broad and slightly barbed (one barb is missing). The reddish color of the artifact suggests thermal alteration.

ESH 2-4 is missing its entire stem, which appears to have been snapped off. Nevertheless its overall configuration, with strong basal notching, fits the Castroville description very well. The blade edges are mildly convex. The presence of potlids and reddish tint indicate that the point has been burned.

ESH 2-5 is a well-made triangular point with slightly convex blade edges and a slightly concave base. It probably has been resharpened, which may account for some of the convexity of the blade edges. The shoulders are wide and strongly barbed.

ESH 2-6 has a nicely knapped blade with convex edges. The stem has straight edges and base and was formed by deep basal notches. The specimen's shoulders are strongly barbed. The point has been resharpened, but the distal tip was not properly thinned during the last episode. This point has been burned, and a large potlid thinned the stem to about half of its normal thickness.

It is interesting to note how consistent the dimensions of these artifacts are, showing only small variations in the various categories (see Table 1).

**Darl (n = 4).** The Darl type is defined as a well-made, slender, triangular point with straight or expanding stems that make up one-fourth to one-third of the point's overall length. Basal edges are usually slightly concave to straight. Blade and stem edges are often beveled. The distribution of Darl points extends from Central Texas to the Lower Pecos and coastal plain regions, and the type is considered to be diagnostic of the Transitional Archaic, which dates to ca. A.D. 200 (Turner and Hester 1993:101).

Four points in the collection were found to correspond closely to the Darl type description (see Figure 1). Their dimensions and weights are given in Table 2.

As indicated in the table, the stem, base, and neck measurements of these points are very consistent.

ESH 1-6, 2-7, and 2-8 are made of very light brown to light gray cherts of unknown sources that may be light-colored varieties of Edwards Plateau chert. ESH 5-1 is made of a medium gray chert that is probably a variety of Edwards Plateau chert. ESH 1-6 and 5-1 exhibit color changes and have a greasy feel that suggests thermal alteration.

The principal difference in the appearance of the four points is in the configuration of the shoulders. ESH 1-6 has moderately sloping asymmetrical shoulders, and the stem length is 7 mm on one edge and 9 mm on the other. ESH 2-7 has strong square shoulders (one missing) equidistant from the base. ESH 2-8 has one square shoulder 12 mm from the base and one sloping shoulder 14 mm from the base. ESH 5-1 has a square shoulder 14 mm from the base and a sloping shoulder 12 mm from the base.

Darl points often exhibit beveling of the lateral

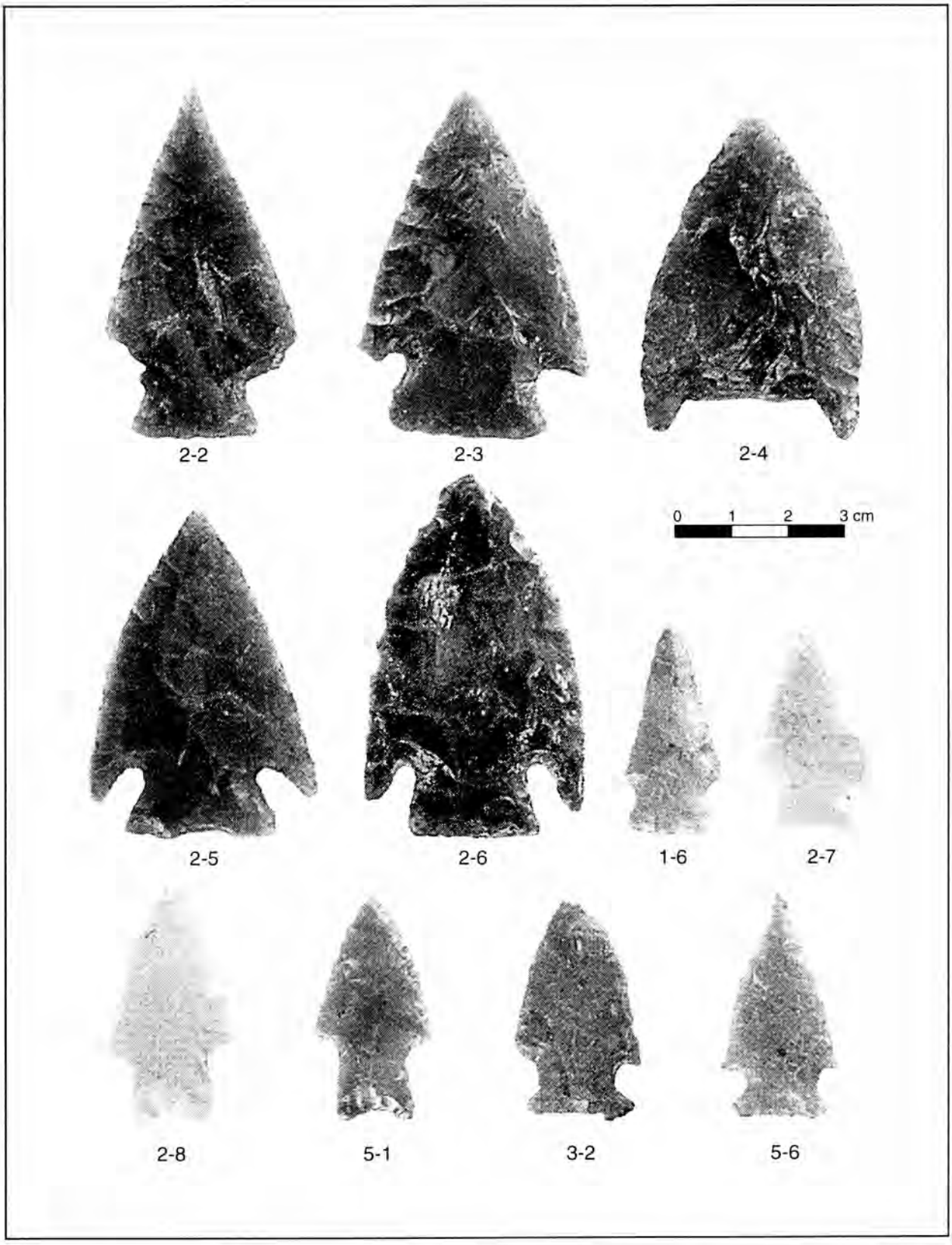


**Figure 1. Points from E. S. Hughes collection. Castroville: 2-2, 2-3, 2-4, 2-5 and 2-6; Darl: 1-6, 2-7, 2-8 and 5-1; Edgewood: 3-2 and 5-6.**

**Table 1. Castroville Points**

| ESP | Dimensions (mm) | | | | | | Weight | |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick. | Base W | Neck W | Stem L | BCON* | (grams) |
| 2-2 | 64 | -- | 7 | 22 | 19 | 11 | 0 | 12.2 |
| 2-3 | 62 | -- | 8 | 28 | 23 | 13 | 0 | 18.3 |
| 2-4 | -- | 39 | 5 | -- | -- | -- | -- | 12.3 |
| 2-5 | 60 | 41 | 8 | 22 | 20 | 13 | 2 | 16.2 |
| 2-6 | 65 | 39 | 7 | 23 | 20 | 13 | 0 | 16.7 |

*BCON = basal concavity.

**Table 2. Darl Points**

| ESH | Dimensions (mm) | | | | | | | Weight | Beveling | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) | Blade | Stem |
| 1-6 | 37 | 17 | 5 | 15 | 12 | 7-9 | 0 | 3.2 | Strong | Slight |
| 2-7 | 38 | -- | 6 | 14 | 13 | 9 | 1 | 3.9 | Slight | Mod. |
| 2-8 | 44 | 23 | 6 | 15 | 14 | 12-14 | 2 | 5.6 | Mod. | Mod. |
| 5-1 | 40 | 21 | 6 | 14 | 12 | 12-14 | 2 | 4.7 | Slight | Strong |

*BCON = basal concavity.

**Table 3. Edgewood Points**

| ESH | Dimemsions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON | (grams) |
| 3-2 | 40 | 22 | 5 | 19 | 14 | 11 | 2 | 5.0 |
| 5-6 | 40 | 21 | 5 | 17 | 12 | 14 | 0 | 3.2 |

*BCON = basal concavity.

**Table 4. Ellis Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 1-7 | 38 | -- | 5 | -- | 13 | 8 | 1 | 4.2 |
| 3-6 | 28 | 23 | 5 | 20 | 17 | 10 | +1 | 3.3 |
| 5-7 | 32 | 25 | 5 | 18 | 16 | 9 | +1 | 3.5 |

*BCON = basal concavity; + = convex base.

edges and stem. The blade of ESH 1-6 has a strong right-hand bevel and a slight left-hand bevel on the stem. The blade of ESH 2-7 is bifacially chipped but in cross section is almost plano-convex. There is a slight right-hand bevel on one edge of the blade and a moderate left-hand bevel on one edge of the stem. The blade thickens toward the tip, and there is a knot on one face of the blade.

ESH 2-8 has a moderate right-hand bevel on the blade edges and a moderate left-hand bevel on the stem edges. The tip probably has been reworked, because it is thick and canted toward one face of the blade. ESH 5-1 has a blade that is thick all the way to the tip. It has a strong right-hand bevel on the blade and a strong right-hand bevel on the stem.

None of these points exhibits any evidence of stem grinding that would suggest the variations of the Darl point that have been named Mohamet and Zephyr.

**Edgewood (n = 2).** The Edgewood type is typically a small triangular dart point with an expanding stem and a concave to straight base (Turner and Hester 1993:111). Blade edges are usually convex but sometimes straight (Bell 1958:20) The Edgewood type is found in many areas of Texas and is considered to be Transitional Archaic, ca. 300 B.C. to A.D. 700, in age (Turner and Hester 1993:111).

Two artifacts in the collection are classified as Edgewood points. Their measurements and weights are presented in Table 3, and they are illustrated in Figure 1.

Both artifacts are made of Edwards Plateau chert, and ESH 3-2 exhibits a red color in the basal area that is evidence of probable heat-treatment. ESH 3-2 was probably resharpened, resulting in curvature of the distal tip. A snap fracture removed a tiny bit of that tip. The specimen's stem is unusual in that it has a slight projection on one corner of the base that gives it a "tang on tang" appearance.

**Ellis (n = 3).** The Ellis point is characterized by a short triangular blade with straight edges and by corner notches, barbs, and a wide expanding stem. The base is usually straight or slightly convex. Ellis points are considered to be of Middle to Transitional Archaic age, ca. 2000 B.C.-A.D. 700, and are found primarily in East Texas but occasionally in South and Central Texas (Turner and Hester 1993:113).

Three artifacts in the collection are classified as Ellis points (see Figure 2). Their dimensions and weights are given in Table 4.

All three specimens are made of a dark gray, almost black, variety of Edwards Plateau chert. ESH 1-7 was burned, as evidenced by a change in color and extensive potlidding. One face of ESH 3-7 has a broad scar from the ventral face of the original flake. These points are characterized by straight edges.

**Ensor (n = 1).** The Ensor type is characterized by a short and wide stem formed by two shallow side notches. The base of this point type is usually straight and as wide or wider than the shoulders. Blade edges are usually straight, giving an overall triangular shape. According to Turner and Hester (1993:114) Ensor points are of Transitional Archaic age, ca. 200 B.C.-A.D. 600, and are widespread in Central and South Texas.

The collection contains only one Ensor point, ESH 1-11. It is 57 mm long, 29 mm wide, and 7 mm thick. The basal width measures 29 mm, the neck width 18 mm, and the stem length 10 mm. Its weight is 8.1 grams. The blade edges are slightly irregularly serrated, and the blade has a right-hand bevel. The specimen is made of a brown Edwards Plateau chert. It is shown in Figure 2.

**Fairland (n = 5).** The Fairland point typically is a medium-sized triangular point with expanding stems and a concave base (Bell 1960:38). Shoulders are narrow and seldom barbed, and the base is characterized by a deep, wide concavity, which produces very sharp corners (Suhm Krieger and Jelks 1954:424). Fairland points are found mainly in Central Texas and occasionally in South Texas and the Lower Pecos in Transitional Archaic sites, ca. 300 B.C.-A.D. 700, according to Turner and Hester (1993:117).

Five artifacts in the collection are classified as Fairland points and are illustrated in Figure 2. Their dimensions and weights are presented in Table 5.

All of the points are made of Edwards Plateau chert of varying shades of gray and brown. ESH 3-7 appears to have been burned. The bases of 3-4, 3-7 and 3-10 have all been damaged by the removal of one or both corners. This is probably a common occurrence during normal use because the basal corners are so sharp. The blades of ESH 3-7, 3-10, and3-11 exhibit beveling, and ESH 3-8 and 3-11 are slightly serrated.

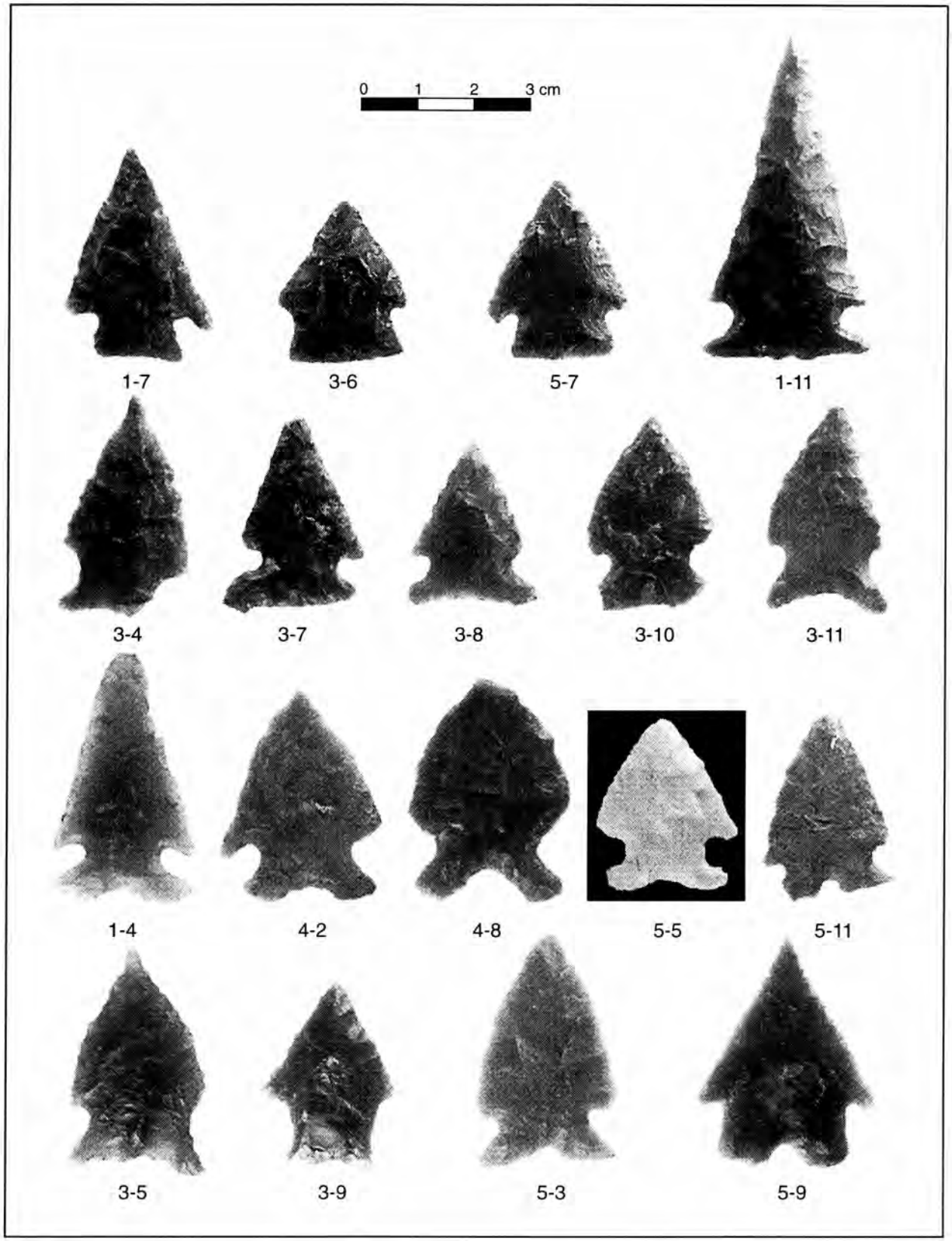


**Figure 2. Points from E. S. Hughes collection. Ellis: 1-7, 3-6 and 5-7; Ensor: 1-11; Fairland: 3-4, 3-7, 3-8, 3-10 and 3-11; Frio: 1-4, 4-2, 4-8, 5-5 and 5-11; Martindale: 3-5, 3-9 and 5-3; Montell: 5-9.**

**Table 5. Fairland Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 3-4 | 39 | 22 | 5 | - | 13 | 11 | # | 4.1 |
| 3-7 | 34 | - | 5 | - | 13 | 11 | # | 3.8 |
| 3-8 | 29 | 23 | 4 | 23 | 14 | 9 | 2 | 2.5 |
| 3-10 | - | - | 5 | - | 14 | - | # | 4.2 |
| 3-11 | 36 | 21 | 6 | 21 | 15 | 12 | 4 | 3.8 |

*BCON = basal concavity; # = concave but not measurable.

**Table 6. Frio Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 1-4 | 44 | 25 | 5 | 24 | 13 | 10 | 2 | 5.1 |
| 4-2 | 37 | -- | 6 | 23 | 16 | 11 | 3 | 5.7 |
| 4-8 | -- | 38 | 6 | 26 | 18 | 12 | 6 | 7.7 |
| 5-5 | 31 | 24 | 6 | 21 | 14 | 11 | 2 | 3.6 |
| 5-11 | 32 | 33 | 5 | -- | 16 | 8 | 3 | 3.5 |

*BCON = basal concavity.

**Table 7. Martindale Points**

| ESP | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 3-5 | 40 | -- | 7 | 24 | 18 | 12 | 3 | 5.9 |
| 3-9 | 33 | 24 | 7 | 16 | 15 | 13 | 2 | 4.5 |
| 5-3 | 40 | 25 | 6 | 24 | 16 | 14 | 4 | 5.9 |

*BCON=basal concavity

**Frio (n = 5).** The Frio point type typically has a triangular blade, often short and broad with wide side or corner notches, and has a concave basal indentation that ranges from shallow to a deep U-shaped notch (Turner and Hester 1993:122). Bell (1960:48) notes that the bases of Frio points often have a recurved shape. Frio points occur throughout Central and South Texas and are also found in the Lower Pecos and Trans-Pecos regions. This point is commonly encountered in Transitional Archaic sites, ca. 200 B.C.-A.D. 600, according to Turner and Hester (1993:122).

Five artifacts in the collection are identified as Frio points. Their dimensions and weights are given in Table 6, and they are illustrated in Figure 2.

All of the artifacts except 5-5 are made of Edwards Plateau chert of various shades of gray and brown. ESH 5-5 is made of an opaque white chert that may be a light variety of Edwards Plateau chert.

ESH 1-4 is damaged, probably the result of an impact that squared off the distal tip. There is a burin-like scar about 15 mm long extending from the damaged tip along one edge of the blade. Microscopic flaking on the squared-off tip may be due to rough handling or some light use as a burin. There is no evidence of any attempt to resharpen the tip.

ESH 4-2 exhibits interesting flake scars on the distal tip. Some event or events left burin-like scars along both blade edges from the tip. One scar is 15 mm long and the other is 13 mm long. They may have resulted from an impact or they may have been made deliberately to aid in resharpening the tip (Alston Thoms, personal communication, 1998). Some reworking is evident on the shorter scar. Both scars lack the patina present on the rest of the artifact, indicating that some reuse was made of the point long after it was originally produced.

ESH 4-8 has burin-like scars on both edges of the distal end, probably the result of impact fractures. Partial resharpening is evident along one edge of the specimen. Both shoulders of this artifact are missing, probably as the result of use rather than some resharpening effort.

ESH 5-5 probably has been sharpened several times, as only a short, thick blade remains. One face of the blade has a sizable knot that the knapper was unable to remove. One barb has been snapped off, probably during use.

ESH 5-11 has a small U-shaped notch in the base, 4 mm wide and 3 mm deep. One corner of the base is missing.

It is interesting to speculate why so many of the Frio points have burin-like scars. While it is possible the scars are all the result of impact fractures, the possibility that they were actually made intentionally should not be overlooked. One possibility, suggested by the resharpening scars, is that they may have been made to provide platforms for reworking the blade edges. Or, perhaps they were made intentionally to produce burins.

**Kinney (n = 1).** The unstemmed Kinney type has triangular to leaf-shaped blades with a concave base. It is found in South and Central Texas and in Lower Pecos sites of Middle Archaic age, ca. 2500-1000 B.C. (Turner and Hester 1993:37).

Only one Kinney point, ESH 4-1, is included in the collection. It is 71 mm long, 32 mm wide and 8 mm thick. The basal width is 27 mm, with a basal concavity of 4 mm, and the specimen weighs 18.7 grams. There is slight smoothing of one basal edge for about 15 mm that may represent the haft length. The point is made of a grayish brown Edwards Plateau chert. The lateral edges show some use-wear and step-fractures, suggesting light use as a knife. This specimen is shown in Figure 3.

There are some interesting scars at the tip of this artifact. An impact fracture removed the original tip, which was then reworked. On one face, a flake hinged out about 4 mm from the distal tip. On the opposite face, unifacial flaking shaped the tip into a rounded chisel-like bit. There is no evidence of any extensive use of the "bit," although some microflaking is evident. The surviving portion of the impact scar has a slight sheen. The events shaping the tip were much later than the original manufacture, as evidenced by the difference in the patina.

**Lerma (n = 1).** Turner and Hester (1993:145) describe Lerma points as slender, double-pointed leaf-shaped blades. One end is usually more rounded than pointed. These points can be used either as knives or projectile points. They usually are found in South Texas and the Lower Pecos in Paleoindian or Early Archaic sites.

Only one artifact, ESH 6-1, is classified as a Lerma point. It is shaped like an Angostura point but lacks the oblique parallel flake pattern, the basal smoothing, and the concave base of that type.

ESH 6-1 is 93 mm long, 26 mm wide, and 10 mm

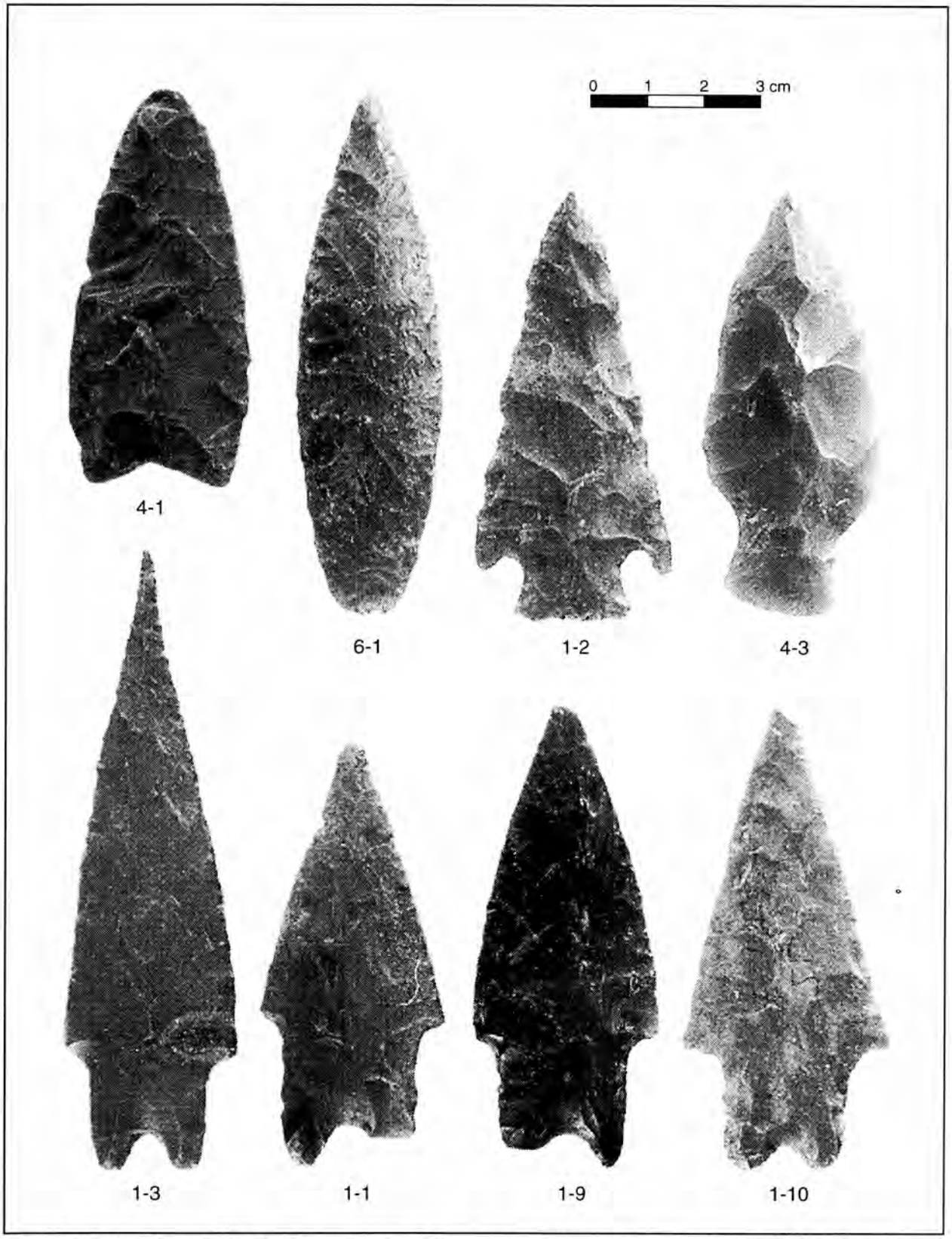


**Figure 3. Points from E. S. Hughes collection. Kinney: 4-1; Lerma: 6-1; Marshall: 1-2; Palmillas: 4-3; Pedernales: 1-3, 1-1, 1-9 and 1-10.**

thick, and it weighs 22.2 grams. The basal width is 10 mm. About 20 mm of the basal edges are thinned by edge trimming, perhaps to facilitate hafting. A small area of the tip has been removed by a hinge fracture (see Figure 3). The lateral edges of this artifact are rounded and heavily step-fractured, suggesting moderate to heavy use as a knife.

The specimen was made from a light brown Edwards Plateau chert. A trace of cortex remains on the basal end, and the cortex material is slightly rounded, perhaps from socket wear in a haft.

**Marshall (n = 1).** Turner and Hester (1993:149) describe the Marshall type as a "broad, triangular point with moderately to strong convex lateral edges and strong shoulders that are often deeply barbed." Stems are relatively short and expanding and have concave bases. Marshall points are found primarily in Central Texas at Middle Archaic sites, ca. 1000 B.C. (or earlier).

One artifact in the collection, ESH 1-2, is identified as a Marshall point. It is 76 mm long, 35 mm wide, and 7 mm thick. Basal width is 20 mm, neck width 17 mm, and stem length 12 mm. The specimen weighs 14.6 grams. The lateral and basal edges are straight. Blade edges are slightly serrated and the shoulders are wide and strongly barbed. The specimen is made of a brown variety of Edwards Plateau chert. It is shown in Figure 3.

**Martindale (n = 3).** Bell (1960:19) describes the Martindale type as a barbed dart point characterized by an expanding stem with a "fishtail" shaped base. Martindale is a triangular point with straight to convex edges. Turner and Hester (1993:151) state that it is primarily a Central Texas point from the Early Archaic, ca. 6000-2500 B.C.

Three artifacts in the collection fit this description. All three are made of Edwards Plateau chert of various shades of brown and gray. Their dimensions and weights are listed in Table 7 and they are shown in Figure 2.

ESH 3-5, although it shares some characteristics with the Fairland type (Turner and Hester 1993:117), was placed in this category because the base closely resembles that of the Martindale type. This artifact has been resharpened, perhaps a number of times. Unifacial flaking has curved the tip toward one face of the blade. The final sharpening left a needle-sharp tip that may have been used as a perforator.

ESH 3-9 has been bifacially resharpened until only a short, thick triangular blade remains. The stem has a steep, left-hand bevel. This artifact has an unusually vitreous luster.

ESH 5-3 has a "classic" Martindale shape. It may have been slightly wider originally, as the barbs show slight damage that could have occurred during manufacture or through use.

**Montell (n = 1).** The Montell type is a triangular point characterized by a short bifurcated stem. The basal notch is virtually V-shaped but may be somewhat rounded. According to Turner and Hester (1993:157) the shoulders are strong and usually barbed. Montell points are found mainly in Central Texas and the Lower Pecos and are associated with Late to Transitional Archaic sites, ca. 1000 B.C.-A.D. 300.

Only one Montell point, ESH 5-9, is included in the collection, and it is a classic example of that type (see Figure 2). It is 41 mm long, 31 mm wide, and 5 mm thick. Its base width is 23 mm, its neck width 22 mm, and its stem length 12 mm. The basal notch is 5 mm deep. The specimen weighs 4.5 grams. The blade edges are slightly serrated and it has a very sharp tip.

ESH 5-9 is made of a light brown chert with reddish tinges. It is translucent on the thin edges. It fluoresces orange, which is consistent with other Edwards Plateau chert.

The blade edges show slight rounding and some polish, which suggests that the point was used as a knife. Rounding, as used here, is defined in sectional view by a single line forming a continuous convex curve extending from one artifact face, through the worn area, and into the adjoining artifact face (Ahler 1979:304).

**Palmillas (n = 1).** According to Davis (1992:146), the Palmillas type is typically a small to medium-sized dart point with a triangular to ovoid outline. Suhm, Krieger and Jelks(1954:462) state that the chief characteristic is a small, bulbous stem with expanded, rounded sides and a convex base. Shoulders may vary from slight to well rounded. The distribution of Palmillas points is not well documented. Turner and Hester (1993:167) report that it has been recovered from Late Archaic sites, ca. 1000-300 B.C.

Only one point of this type, ESH 4-3 (see Figure 3), was identified in the collection. It is 76 mm long, 31 mm wide, and 12 mm thick. Basal width is 21 mm,

neck width is 17 mm, and stem length is 17 mm. The specimen weighs 23.7 grams and appears to have been made of the same material as the Montell point, although it gives only a very faint orange response to fluorescent light. The blade is crudely shaped, mainly by percussion flaking. The stem is thin and shaped by pressure flaking.

**Pedernales (n = 9).** Turner and Hester (1993:171) note that the "size and body dimensions vary greatly in this narrow to broad or, often, leaf-shaped, triangular point depending on how much of it has been reworked. . . . While the body is highly variable, the type is characterized by a more or less regular, bifurcated stem. The basal concavity is often thinned by a broad flute-like flake from one or both sides." They report this type as common in the Central Texas and Lower Pecos regions in Middle Archaic sites, ca. 2000-1200 B.C.

Nine artifacts of the collection fit the Pedernales type description. Their dimensions and weights are recorded in Table 8, and the specimens are shown in Figures 3 and 4.

All nine specimens are made of Edwards Plateau chert in varying shades of brown and gray. ESH 1-9, 1-11, and 6-2 may have been heat-treated.

ESH 1-1 is fairly well made in spite of the poor quality chert used. One leg of the stem is shortened by about 5 mm by an impact flute that runs about 11 mm and ends in a step-fracture. Several millimeters of the original tip are missing as the result of a hinge fracture. The shoulders are slightly sloping, and the basal notch was formed by removing one broad flutelike flake from one face and by removing several short flakes from the other face.

ESH 1-3 is an excellent example of an extremely long and slender, sharp Pedernales point The notch was made by taking a single wide flake from each face. The blade edges are slightly serrated and the shoulders are moderate and nearly square. One face of the blade is marked by a vug measuring 6 by 11 mm. This artifact likely never functioned as a projectile point, as it is too delicate. The visible use-wear patterns, consisting of rounding and step-fractures, indicate that it probably was used exclusively for cutting and piercing.

ESH 1-9 is a well-made point with slightly convex and nearly square shoulders. The notch was made by removing one long, wide flake from each face of the stem. One leg of the stem has been squared off and shortened about 3 mm by a complex fracture.

ESH 1-10 is a well-made triangular point with nearly square shoulders. The basal notch was made by removing one short, wide flake from each face of the stem.

ESH 3-12 is the final stage of a much resharpened point. The last sharpening event left a stubby triangular point with recurved edges leading to a needle-like point. Use-wear on the tip suggests that the point's last use was as a perforator. The wide basal notch was made by removing one wide flute-like flake from one face and by removing two wide, overlapping flakes from the other face of the stem.

ESH 5-2 is a poor example of a Pedernales point. The basal notch was made by taking two long, wide flakes from one face and one wide, long flake from the other face, followed by some retouching of edges on both faces. One lateral edge of the blade is battered into a recurved shape, perhaps the result of an attempt to remove a thick knot on one face of the blade. The unbattered edge shows extensive rounding, suggesting that the artifact was used as a knife and a perforator.

ESH 5-4 is almost plano-convex in cross section. It is fairly thin except for a knot on one face at the distal end of the stem. The shoulders are moderately sloping. The basal notch was made by first removing one short, wide flake from one face, followed by some retouch flaking, and then removing numerous short flakes from the reverse face. The distal tip exhibits considerable damage, perhaps caused by impacts.

ESH 5-10 is a triangular point with a very sharp tip. A bit of cortex is present on one leg of the stem. One shoulder is square and the other is missing as the result of a force that removed the entire shoulder area. The basal notch was made by the removal of a long, broad flake from each face of the stem. The blade edges show little evidence of rounding or step-fractures except for areas near the shoulders where there is much rounding. This may be due to use of the artifact for cutting, followed by a resharpening event that removed evidence of the use-wear from most of the upper portions of the blade edges. The distal tip has a few small flake scars, probably the result of a twisting action.

ESH 6-2 has a stubby triangular blade with recurved edges and a sharp point, the result of much resharpening. The blade edges have a left-hand bevel and are slightly serrated. Blade edges show moderate rounding and step-fractures, suggesting use for cutting. The basal notch was made by removing one

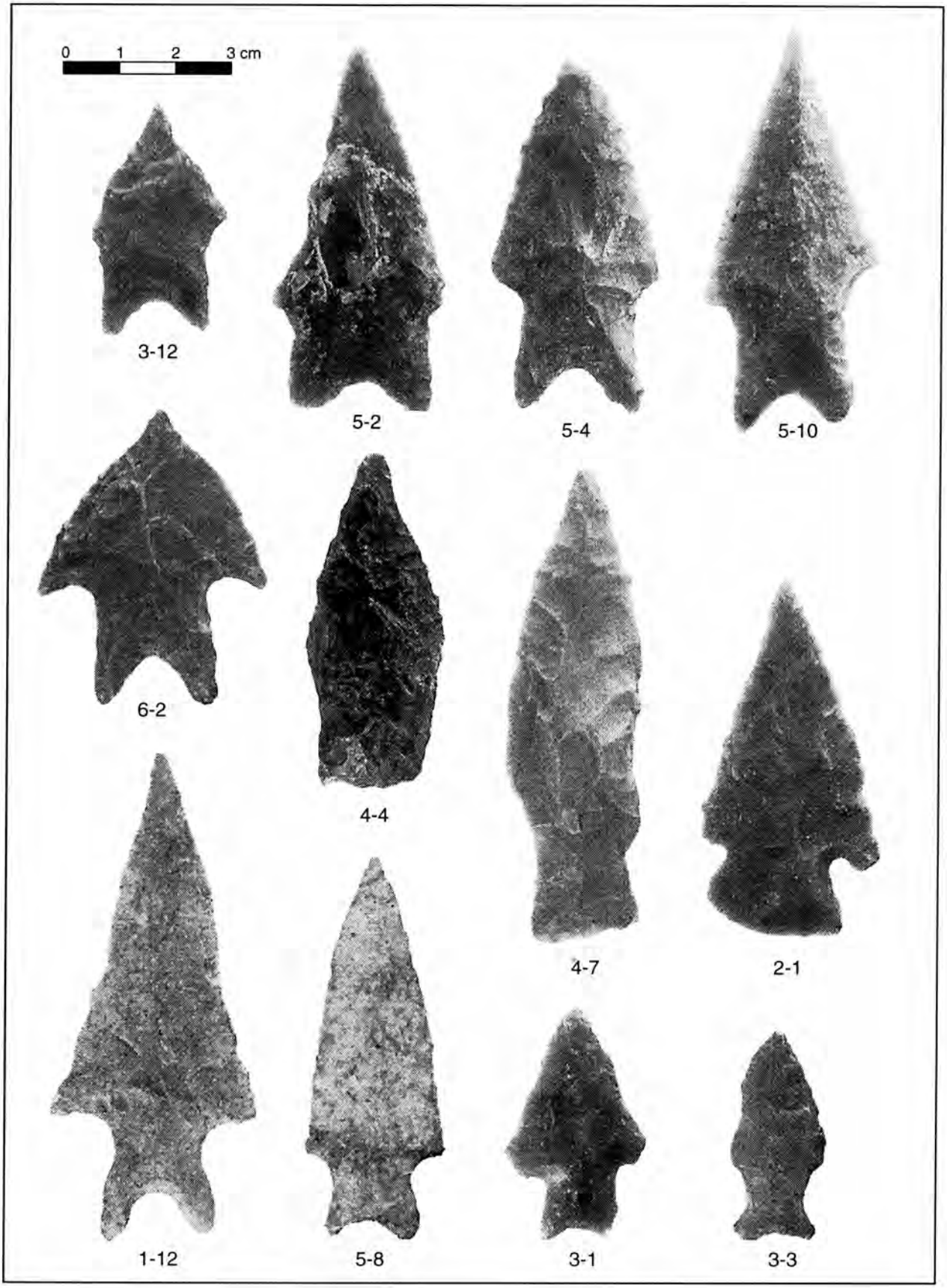


**Figure 4. Points from E. S. Hughes collection. Pedernales: 3-12, 5-2, 5-4, 5-10 and 6-2; Travis: 4-4 and 4-7; Williams: 2-1; Uvalde: 1-12, 3-1, 3-3 and 5-8.**

**Table 8. Pedernales Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 1-1 | 75 | 32 | 9 | 23 | 24 | 24 | 7 | 16.3 |
| 1-3 | 110 | 31 | 8 | 18 | 21 | 20 | 6 | 23.7 |
| 1-9 | 81 | 33 | 8 | 21 | 23 | 22 | 6 | 17.6 |
| 1-10 | 81 | 36 | 7 | 20 | 22 | 20 | 4 | 16.2 |
| 3-12 | 41 | 24 | 6 | 19 | 19 | 18 | 6 | 5.6 |
| 5-2 | 64 | - | 8 | 26 | 24 | 18 | 6 | 12.0 |
| 5-4 | 63 | 30 | 8 | 23 | 20 | 21 | 8 | 11.7 |
| 5-10 | 75 | - | 7 | 21 | 20 | 21 | 6 | 12.0 |
| 6-2 | 53 | 41 | 7 | 22 | 20 | 22 | 9 | 10.5 |

*BCON = basal concavity.

**Table 9. Travis Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 4-4 | 61 | 24 | 12 | 18 | 18 | 24 | 0 | 14.8 |
| 4-7 | 84 | 24 | 11 | 19 | 16 | 21 | 0 | 18.4 |

*BCON = basal concavity.

**Table 10. Uvalde Points**

| ESH | Dimensions (mm) | | | | | | | Weight |
|---|---|---|---|---|---|---|---|---|
| No. | Length | Width | Thick | Base W | Neck W | Stem L | BCON* | (grams) |
| 1-12 | 85 | 36 | 12 | 20 | 16 | 22 | 8 | 16.8 |
| 3-1 | 41 | - | 6 | 13 | 12 | 13 | 2 | 5.9 |
| 3-3 | 38 | 17 | 6 | 15 | 10 | 11 | 2 | 3.6 |
| 5-8 | 67 | 25 | 7 | 17 | 14 | 16 | 4 | 9.3 |

*BCON = basal concavity.

**Table 11. Arrowpoints**

| ESH | Dimensions (mm) | | | Weight | Type |
|---|---|---|---|---|---|
| No. | Length | Width | Thick | (grams) | |
| 1-5 | 36 | 12 | 4 | 1.8 | Edwards? |
| 4-9 | -- | -- | 3 | 1.3 | Unclassified |
| 4-10 | -- | -- | 3 | 1.1 | Unclassified |
| 5-12 | 30 | 21 | 5 | 2.2 | Perdiz? |

wide flake from each face, followed by some retouch of the notch edges.

Most of the Pedernales points exhibit use-wear, in the form of rounding and step-fractures, on the blade edges and tips, suggesting use for cutting and piercing. The deep notch in the base is probably a strategy devised to give maximum socket stability, which would be especially desirable in a knife. The nine points provide an exemplary range of the Pedernales type, from a newly finished point to an often resharpened point that is near the end of its useful life.

**Travis (n = 2).** Turner and Hester (1993:189) describe the Travis type as a "slender triangular point with rounded shoulders that vary from slight to fairly prominent." The stem usually has parallel edges with a straight base. Travis points are found mainly in Central Texas in Middle Archaic sites, ca. 2650-2050 B.C.

Two artifacts in the collection are identified as Travis points (see Figure 4). Their dimensions and weights are shown in Table 9. One specimen, ESH 4-4, is made of a very dark brown chert that shows a "hackly" fracture pattern. The material source is unknown, but it fluoresces orange like the other Edwards Plateau chert examples. The specimen appears to have been burned. The other specimen is made of a grayish variety of Edwards Plateau chert.

ESH 4-4 is a crude, thick, triangular artifact formed entirely by percussion flaking. The hackly characteristic of the chert made it difficult to knap. The shoulders are long and slope strongly toward the tip. One face of the blade has a strong keel.

ESH 4-7 has a long slender blade whose axis is about 10 degrees off of being perpendicular to its base. The blade has a moderate left-hand bevel, and one face has a large knot. The basal edge is straight.

**Uvalde (n = 4).** Uvalde points are a small to medium-sized, highly variable type with triangular to leaf-shaped outlines. According to Bell (1960:92), the type is characterized by a flaring stem with a deep concave base. Similar points have been called "Early Corner Notched." According to Turner and Hester (1993:191), Uvalde is primarily a Central Texas type and is thought to be diagnostic of the Early Archaic period, ca. 6000-2500 B.C.

Four specimens in the collection are classified as Uvalde points, and they vary greatly in appearance Their weights and dimensions are given in Table 10 and they are shown in Figure 4.

ESH 1-12 is a crude triangular point with a sharp distal tip. Most of the flaking was done by percussion methods. Just above the shoulders there is a major imperfection represented by a large knot on one face and a smaller knot on the opposite face at about the same location. The artifact is made of a light gray chert with small (0.3 by 0.3 mm) black inclusions. The high spots on the knots are yellowish in color, suggesting that the specimen may have been made from a tabular piece of chert. The material source is unknown. The extremely strong shoulders are lightly barbed.

ESH 3-1 is a small, crude triangular point with a strong left-hand bevel on the blade. A profile view of the artifact shows that the plane of the blade is about 15 degrees off the plane of the stem (the point looks bent). The specimen's maximum thickness is near the distal tip. It is made of a light brown variety of Edwards Plateau chert.

ESH 3-3 is a small, crude triangular point with one sinuous edge caused by a heavy overstrike near the midpoint of one edge. The shoulders slope strongly toward the distal tip. The specimen is made of a medium gray to tan Edwards Plateau chert that appears to have been heat-treated.

ESH 5-8 is a slender triangular point with slightly convex edges. The shoulders are square, and the legs of the stem are unequal in size and length. The specimen is made of a pinkish cream-colored chert with gray mottling. The source of this material is unknown.

**Williams (n = 1).** The Williams point is a medium- to large-sized dart point with a triangular to leaf-shaped blade and is characterized by an expanding stem and a convex base. Suhm, Krieger and Jelks (1954:490) note that the stem is formed by corner notches and that the stem edges and the base meet at an angle. According to Turner and Hester (1993:194), this point type is common in Central Texas in Middle to Late Archaic sites, ca. 2500 B.C.-A.D. 300.

One artifact in the collection, ESH 2-1, is considered to be a Williams point. It is 63 mm long, 32 mm wide, and 7 mm thick, and it weighs 10.8 grams. Basal width is 24 mm, neck width 19 mm, and stem length 15 mm. One blade edge is straight and the other is slightly convex. One shoulder is square and the other has a strong barb. The base is strongly convex, and the stem edges and the base meet at an angle. The specimen was made from a flake of a medium gray

variety of Edwards Plateau chert. The blade shows some light wear and some light step- fractures. Sheen on the high spots on the edges may be polish or residue, as the point has not been cleaned. It is shown in Figure 4.

**Unclassified (n = 2).** Two dart points were not typed because they did not fit any of the commonly described types (see Figure 5).

ESH 1-8 is a lanceolate point with a deep, wide basal concavity. It looks like a Pedernales point that has been sharpened until the shoulders are no longer discernible. However, the width of the stem and the deep basal notch are not characteristic of the Pedernales type. The specimen does not have any horizontal or parallel oblique flaking, nor does it have any smoothing of the stem or basal edges. It is bifacially flaked but the cross section is almost plano-convex. The point is 71 mm long, 28 mm wide, and 7 mm thick. The base width is 27 mm but the stem length is indeterminate. The basal notch is 9 mm deep. The specimen is made of a gray chert with black inclusions like that of Uvalde point 1-12, which is from an unknown source. Part of one edge of the blade and the base have a reddish tinge that suggests exposure to heat, but the entire artifact does not seem to have been heat-treated. The blade edges have no overt signs of use-wear.

ESH 4-5 is a slender triangular blade with a round base. Several millimeters of the distal tip are missing, removed by a snap-fracture. The specimen is 75 mm long (incomplete), 24 mm wide, and 7 mm thick. It weighs 12.9 grams. The blade edges are sinuous and have slight serration. One face has the suggestion of a coarse parallel-oblique flake pattern, while the opposite face has a random flake pattern. The cross section of the distal one-half of the artifact is diamond shaped, while the proximal half is biconvex. There is no smoothing of any portion of the edges. The specimen is made of a light gray, nearly white, chert that is translucent on its thin edges. The broad end has a brown and black inclusion that extends half the length of the artifact. The source of this material is unknown, but it fluoresces orange much like the Edwards Plateau chert. The use-wear evidence on this artifact is inconclusive. The strong distal tip suggests it may have been designed to be a perforator, but the flake scar on the tip does not resemble those that result from boring motions. At present, the type and function of this artifact are undetermined.

## ARROWPOINTS

Four severely damaged arrowpoints are present in the collection. The damage is so severe that it is difficult to assign most of the specimens to a specific type. All appear to have been made of varieties of Edwards Plateau chert, and all appear to be arrowpoints common to Central Texas. Their dimensions and weights are given in Table 11, and they are shown in Figure 5.

ESH 1-5 is probably an Edwards arrowpoint, but the base is too badly damaged for accurate type identification. The blade has one straight edge that is serrated and one recurved edge. The Edwards point is thought to be diagnostic of the early portion of the Late Prehistoric period, ca. A.D. 900-1040 in Central Texas (Turner and Hester 1993:212).

ESH 4-9 is the blade portion of an arrowpoint. The shoulders and stem have been removed by snap fractures. The blade edges are slightly serrated.

ESH 4-10 also is too badly damaged for classification. One shoulder and portions of the stem are missing, and the specimen has been burned.

ESH 5-15 is tentatively identified as a Perdiz point. It has a damaged stem, is basally notched, and has broad, drooping barbs. While the tip is very sharp, the distal portion is much thicker than the rest of the artifact. According to Turner and Hester (1993:227) the Perdiz arrowpoint is found throughout Texas in Late Prehistoric sites, ca. A.D. 1200 and later.

## THIN BIFACES

The collection contains four thin bifaces. They are shown in Figure 5.

ESH 6-3 is a large triangular specimen with nearly straight edges and a very short, broad stem formed by basal notches at the corners of the base. The stem is so short it appears to be inadequate for hafting. The artifact is 106 mm long, 45 mm wide, and 9 mm thick, and it weighs 39.2 grams. The base width measures 34 mm, neck width 33 mm, and stem length 6 mm. The base is straight. It is made of a medium gray, opaque variety of Edwards Plateau chert. The blade edges are heavily rounded and step- fractured, indicating use for cutting and scraping. The sheen on the blade edges may be polish or residue, as the artifact has not been cleaned. Heavy rounding of the proximal blade edges indicates that the hafting may

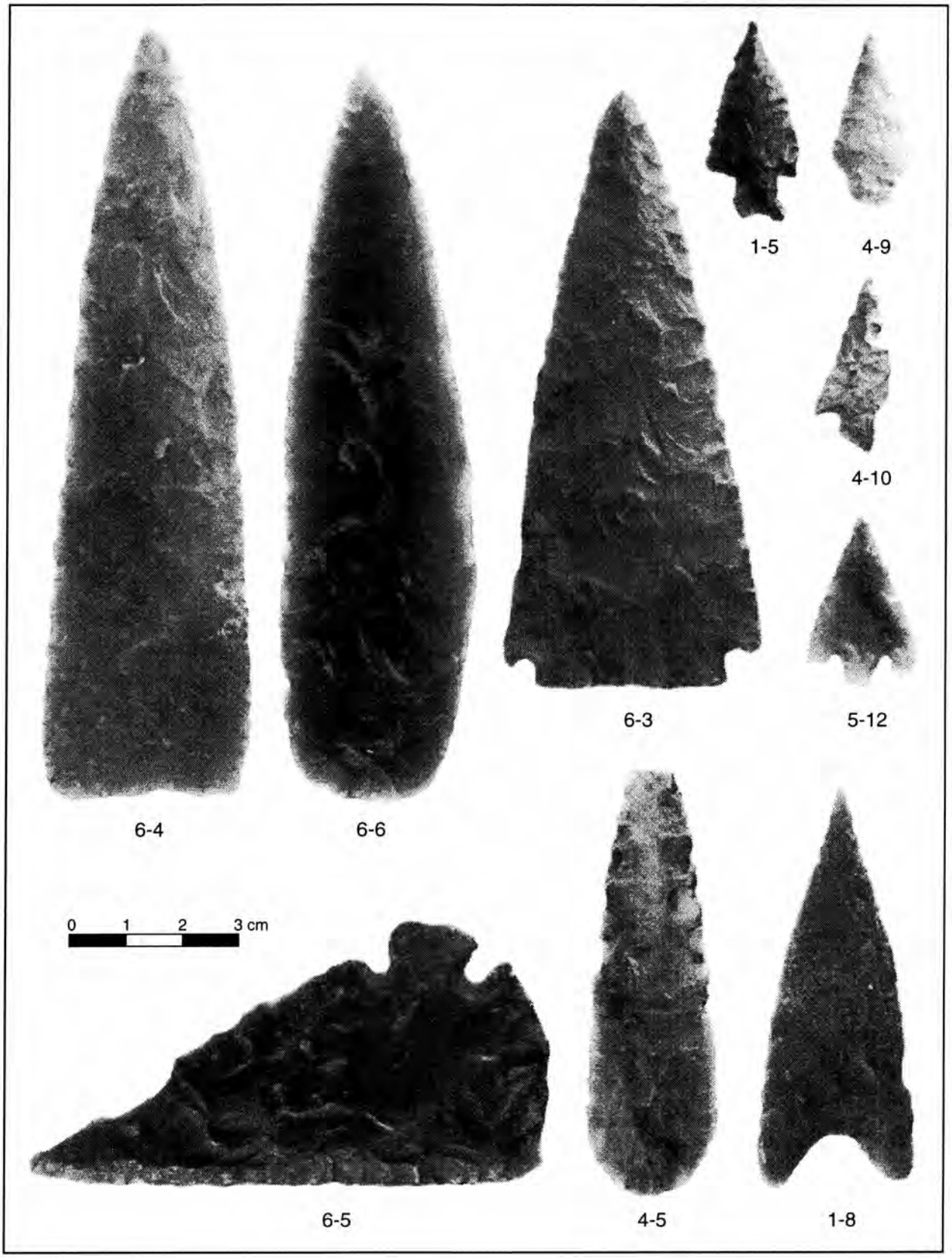


**Figure 5. Artifacts from E. S. Hughes collection. Arrowpoints: 1-5, 4-9, 4-10 and 5-12; Thin Bifaces: 6-3, 6-4, 6-5 and 6-6; Unclassified: 1-8and 4-5.**

have extended as far as 21 mm from the base.

ESH 6-4 is a lanceolate blade with a slightly concave base. The lateral edges are slightly convex and sinuous. The specimen is 135 mm long, 37 mm side, and 8 mm thick. Its basal width is 34 mm and basal concavity 2 mm, and it weighs 42.9 grams. It is made of a light brown Edwards Plateau chert. Its sinuous edges and the lack of use-wear indicate that this artifact is a preform.

ESH6-5 is a triangular corner-tang knife with a strongly convex butt end. It is 94 mm long, 48 mm wide at the top of the tang, 37 mm wide at the butt, and 7 mm thick, and it weighs 29.6 grams. The tang edge has a severe miss-hit scar (18 mm long and 3 mm deep) near the tip. The specimen is made of a dark gray, opaque Edwards chert. The tang edge shows little evidence of use, but the blade edge opposite the tang shows heavy step-fracturing and some rounding, suggesting that it was used more for scraping than cutting. Corner tang knives are found in Central Texas in Late Archaic sites, ca. 1500 B.C.-A.D. 100 (Turner and Hester 1993:250).

ESH 6-6 is lanceolate-shaped with a rounded base. It is made of an excellent quality, dark brown Edwards Plateau chert that is translucent on its thin edges. It is 131 mm long, 35 mm wide, and 8 mm thick, and it weighs 36.3 grams. The flaking pattern is more or less parallel oblique, but there is little smoothing of the basal end.There is no overt use-wear. This may be a preform for an Angostura point.

### FLAKE

ESH 4-6 (not illustrated) is a flake of dark brown argillaceous chert of unknown origin. It may have been burned. The platform is at the pointed end and has a single facet. The broad end is square, probably from stepping off a core. It is 34 mm long, 18 mm wide, and 5 mm thick, and it weighs 2.2 grams. There is no evidence of use.

## RESPONSE TO FLUORESCENT LIGHT

All of the artifacts were exposed to two kinds of light from a Twin Flur-O-Lite made by the Atomic Research Corporation of Colorado Springs. Most of the specimens fluoresced some shade of orange under the long wave (red) light. The exceptions were the Uvalde points 1-12 (very faint orange) and 5-8 (none). Both 1-12 and 5-8 showed unusually bright violet under the shorter wave (violet) light.

The four Darl points all fluoresced orange under the long wave (red) light and reflected the violet light brilliantly, as did the Frio point 5-5. The excessive response to the violet light may be due partially to the light gray or white colors of these artifacts, but the response was striking.

The overall response confirms the visual identification that most of the lithic material is from Central Texas sources. Fifty-five (92 percent) of the artifacts were probably made of Edwards Plateau chert. The source of the other five is unknown.

## DISCUSSION

The first impression on viewing this collection is that it represents a long period of time. This is more apparent when the percentages of the artifacts are arrayed according to their age.

| | |
|---|---|
| Late Paleoindian (n = 2) | |
| Angostura preform?, Lerma | 3.7% |
| Early Archaic (n = 7) | |
| Martindale, Uvalde | 12.9% |
| Middle Archaic (n = 13) | |
| Kinney, Marshall, Pedernales, Travis | 24.1% |
| Middle to Late Archaic (n = 2) | |
| Palmillas, Williams | 3.7% |
| Middle to Transitional Archaic (n = 3) | |
| Ellis | 5.6 % |
| Late Archaic (n = 6) | |
| Castroville, corner-tang knife | 11.1% |
| Transitional Archaic (n = 17) | |
| Darl, Edgewood, Ensor, Fairland, Frio | 31.5% |
| Late Prehistoric (n = 4) | |
| Arrowpoints | 7.4% |

The preponderance of points fall in the Middle and Transitional Archaic periods. These artifacts span a period of almost 5,000 years. This immediately raises a question about the nature of the collection: Is this a native cache or a later collection? It looks more like the latter, which brings up the question, Who collected them before young Betty Staha found them? Unfortunately neither question can be answered.

The question of the origin of the collection seems best answered by the Hill Country location. The artifacts are Central Texas types and most of the materials are from Central Texas sources (92%).

The high incidence of burin-like scars on the Frio

points is cause for conjecture. Is this simply a coincidence of impact flutes, the result of deliberate manufacture of burins, or a technique for resharpening?

The research value of this collection lies in the fact that it contains classic examples of a number of types and provides an opportunity to document them and their variations. The series of Pedernales points is an excellent example of the range from a "new" or little-used point (ESH 1-3) to a nearly exhausted point (ESH 1-12). Such artifact arrays give insight into the variations one might expect in a given type. In addition, the collection stimulates consideration of problems such as the burin-like scars on the Frio point.

## ACKNOWLEDGMENTS

The staff of the Texas Historical Commission's Office of the State Archeologist assisted in various parts of this study but special recognition is due the State Archeologist Patricia Mercado-Allinger for her guidance and comments, to Helen Simons for the final editing and to Roland Pantermuehl for preparing the illustrations. However, any errors are solely the responsibility of the author.

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# NORMAN G. FLAIGG

## 1918 - 1998

Norman G. Flaigg, a resident of Austin since 1971, passed away Wednesday, November 4, 1998, a victim of heart disease. Norman was stricken by a massive heart attack during the session of the Texas Archeological Stewardship Network at the Annual Meeting of the Texas Archeological Society (TAS) in Waco. That traumatic incident will long be remembered as a sad moment when friends standing near felt so terribly helpless and inadequate.

He was born July 14, 1918, in Deadwood, S.D., the first child of Louis and Rena Flaigg of Hoover, S.D. He grew up on the family ranch in Butte County and attended a country grade school there. He graduated from Sturgis High School in 1934 and from the South Dakota School of Mines in 1939 with a degree in civil engineering. It was on the family ranch that Norman got his first taste of archeology as he made observations of hearth and tipi ring features and began a personal collection of Native American artifacts.

He worked briefly for the Bureau of Mines on a Strategic Mineral Survey at Tinton, S.D., and then began working for the Bureau of Reclamation in January 1940 in Texas. His entire career was spent investigating water-resource projects, except for two years in the Army during World War II. During his career he prepared reports, plans, and estimates for water-supply projects in Colorado, Kansas, Oklahoma, and Texas. He also directed the preparation of a State Water Plan for Oklahoma and a plan to import water from the Mississippi River to the High Plains of Texas. He retired in 1977 following open-heart surgery in 1975.

Norman had a lifelong interest in archeology and obtained a Master of Arts (Archeology) from the University of Texas at Austin in 1982, studying under Dr. Dee Ann Story. Much of his time in retirement was spent playing bridge, photographing wildflowers, traveling, and volunteering at the State Archeologist's Office at the Texas Historical Commission (THC) and the National Wildflower Center.

In Texas archeology, Norman was known for his active involvement, his many accomplishments, and his tongue-in cheek wit. Dr. Story told me on January 7, 1998, that "Norman was a delightful person in every respect, and everything that he did he did with care and did well." Everyone at the THC, where Norman has served as a volunteer for one day a week for several years, can attest to that statement. His list of publications runs to several pages and he was particularly interested in lithic artifacts. His master's thesis was on the lithic materials recovered from 41TT110 (the Benson's Crossing site), which was excavated in 1978 by Dee Ann Story's UT-Austin Field School.

Norman loved the people and programs of TAS, especially the summer field schools. He was a great teacher and his "Good Book" lessons started every morning's work at the sites where he was a supervisor. A show of hands at the Waco TAS Board of Directors meeting indicated that 75 percent of the members attending had either worked under his supervision or with him on TAS field projects. Many in TAS can say proudly that Norman was their first crew chief. I suspect that that positive experience caused many to think that archeology was a fun and interesting pursuit.

I'm pleased to say that Norman considered me a friend and that I had the pleasure to work with him many times, most notably for me at 41BX568 (the Coleman site) and recording rock art in Fate Bell Shelter as a part of the TAS Rock Art Task Force. He will be missed by many. He will always be remembered by the wonderful carved totem pole that he created as one of the last works of his life. Let's believe that Norman is represented in that howling wolf that crowns his work of art.

Mike Davis

# *WIDTH-TO-THICKNESS RATIOS OF TEXAS DART POINTS*

*Leland W. Patterson*

## ABSTRACT

*A discussion is given on various factors that can affect the width-to-thickness ratio of a bifacial dart point, as an aid to understanding some of the details of the manufacturing process for dart points. Comparisons are made between data sets for dart points from Central and Southeast Texas, showing the effects of material types.*

## INTRODUCTION

In a previous article (Patterson 1987), the skill of flintknappers was discussed in terms of producing large bifacial stone artifacts, such as knives, with high width-to-thickness ratios (W/T ratios). Skillful knappers can produce large bifaces with W/T ratios of over 5.0. In this article, W/T ratios are discussed in relation to the manufacturing process for bifacial dart points. Important factors are considered that result in a range of W/T ratios for dart points.

There are several important variables in the manufacture of bifacial projectile points that affect the W/T ratio. These factors are: (1) W/T ratio of the starting flake blank, (2) toughness of material, with or without heat-treatment, (3) skill of knapper, (4) type of percussor, hard or soft, and (5) style of projectile point.

Based on modern flintknapping experiments, it may be concluded that a high proportion of prehistoric dart points were made using a soft percussor, because a soft percussor, such as an antler billet, can produce longer, thinner flakes than a hard percussor (hammerstone). In this study, it is assumed that the archaeological data used represent a range of skills of prehistoric flintknappers. Average metric data are used so that factors other than knapping skill can be considered.

The main variables considered here that affect W/T ratios are quality of material and projectile point style. It is shown that these two factors can affect W/T ratios in general. Comparisons are made here between dart points of Central and Southeast Texas, with significant differences in W/T ratios due to both dart point styles and quality of lithic raw materials.

## SUMMARY OF DATA

Data from two archaeological sites in Central Texas are used here, given in Table 1. A set of mixed dart point styles at the Buckhollow site, 41KM16, in Kimble County (Johnson 1994:Table 15) are used. Data for Ensor, Fairland, and Darl points at site 41HY209M (Ricklis and Collins 1994:Tables 15,16, 17) are used separately.

Data from two archaeological sites in Southeast Texas are used here, given in Table 2. There is a set of mixed dart point types from site 41HR182 in Harris County (Patterson 1985:Table 1), including Gary, Kent, Yarbrough, Darl, and Ellis types. A set of dart points from site 41FB3 in Fort Bend County (Patterson et al. 1998:Table 3) includes Gary, Kent, Morhiss, Ensor, and Ellis types. Data for a set of five Ellis points from 41FB3 are given separately as grave goods from a single burial, because of the relatively high mean W/T ratio compared to the set of mixed point types.

## W/T RATIO DUE TO POINT STYLES

It was noted in the Introduction that W/T ratios of dart points can be affected by styles of points. Wider dart point styles tend to have higher W/T ratios. This is shown in Figure 1 for a plot of W/T ratio versus mean width, using the data for dart points from Central Texas given in Table 1. It is assumed that the dart points were all made from high quality cherts that are available in Central Texas. Figure 1 shows a good relationship of W/T ratio to point width. As may be seen in Table 1, different types of dart points had significant variation in mean widths, with not much variation in mean thicknesses.

**Table 1. Central Texas Dart Point Data**

| | 41KM16 points | 41HY209M points | | |
|---|---|---|---|---|
| | | Ensor | Fairland | Darl |
| Width, mm | | | | |
| mean | 29.6 | 22.8 | 20.9 | 19.2 |
| Stan. Dev. | 8.652 | 3.840 | 2.579 | 3.029 |
| range | 22-49 | 19-32 | 17-23 | 14.5-25 |
| Thickness,mm | | | | |
| mean | 5.7 | 5.5 | 5.9 | 6.0 |
| Stan.. Dev. | 1.055 | 0.483 | 0.894 | 0.707 |
| range | 4.2-8.0 | 5.0-6.0 | 5.0-7.0 | 5.0-8.0 |
| W/T_ratio | | | | |
| mean | 5.2 | 4.2 | 3.6 | 3.1 |
| Stan. Dev. | 1.150 | 0.664 | 0.613 | 0.749 |
| range | 3.7-7.2 | 3.2-5.4 | 2.9-4.6 | 2.5-4.2 |
| N (Sample size) | 14 | 17 | 9 | 31 |

**Table 2. Southeast Texas Dart Point Data**

| | 41HR182 points | 41FB3 points | |
|---|---|---|---|
| | | Ellis | Mixed |
| Width, mm | | | |
| mean | 20.2 | 18.8 | 23.2 |
| Stan. Dev. | 3.480 | 2.661 | 3.696 |
| range | 12.5-31.2 | 15.5-22.5 | 14.1-30.3 |
| Thickness, mm | | | |
| mean | 7.8 | 4.2 | 9.1 |
| Stan. Dev. | 1.443 | 0.295 | 2.387 |
| range | 4.8-13.6 | 3.8-4.5 | 4.0-12.4 |
| W/T ratio | | | |
| mean | 2.7 | 4.4 | 2.7 |
| Stan. Dev. | 0.607 | 0.546 | 0.672 |
| range | 1.7-4.7 | 3.8-5.3 | 1.8-4.0 |
| N (Sample size) | 99 | 5 | 12 |

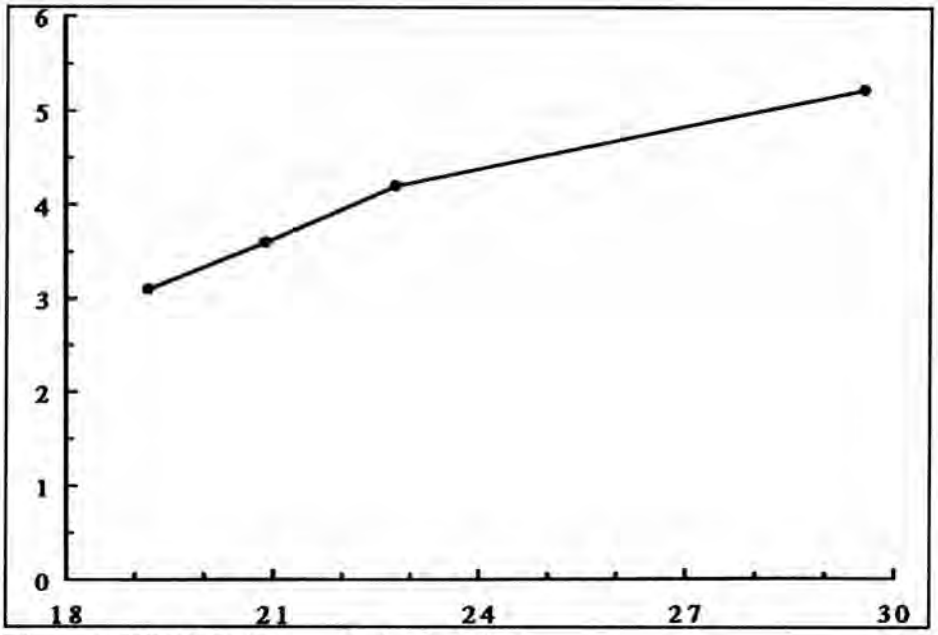


**Figure 1. Width-Thickness Ratio Vs. Width.**

## EFFECT OF MATERIAL QUALITY

The knapping quality of lithic raw material is a prime factor in the production of thin bifaces, such as dart points. Callahan (1979:Table 3) has shown that toughness of lithic raw material is a limiting factor for the W/T ratio of a biface. Toughness is generally a function of the tensile strength of the material, because the main fracture plane of a flake removal represents a tensile fracture.

The knapping quality of chert can be improved by heat-treatment, which decreases tensile strength (Purdy and Brooks 1971, Patterson 1981). However, heat-treatment is generally done only on flake blanks. The production of flake blanks by primary reduction of raw material is affected by basic material quality. It is difficult to produce wide, thin flake blanks from tough cherts. Therefore, flake blanks produced from tough raw materials tend to have low W/T ratios, compared to flake blanks made from high quality raw materials. The W/T ratio of the flake blank limits the W/T ratio of the finished biface, because biface manufacturing is a reduction process that reduces width at the same time that thickness is being reduced. In other words, it is difficult to make relatively thin bifaces from thick flake blanks.

A comparison can be made between W/T ratios of dart points made from high quality Central Texas cherts and dart points made from tough local cherts of Southeast Texas. High quality cherts occur throughout Central Texas. In contrast, cherts used by Indians in Southeast Texas occur in the lower Brazos and Colorado River Basins as cobbles in alluvial deposits. These cherts are generally very tough materials which limit the W/T ratios of flake blanks that can be produced.

As may be seen in Table 2, dart points from sites 41HR182 and 41FB3 in Southeast Texas both have mean W/T ratios of 2.7. In contrast, various dart point types from sites 41KM16 and 41HY209M in Central Texas have mean W/T ratios of 3.1 to 5.7. It is concluded that high quality cherts from Central Texas permit manufacture of dart points with higher W/T ratios than is possible with the tough local cherts of Southeast Texas.

A comparison of data in Tables 1 and 2 shows that dart points from Southeast Texas tend to be thicker than dart points from Central Texas regardless of widths. Various point types from Southeast Texas have mean thicknesses of 7.8 mm to 9.1 mm, while various types of points from Central Texas have mean thicknesses of 5.7 mm to 6.0 mm. As with the above comparison of W/T ratios of points in the two regions, the comparison of thicknesses also seems to indicate that higher quality cherts were used in Central Texas than in Southeast Texas. Data for five

Ellis points from site 41FB3 have been shown separately in Table 2. These specimens are all grave goods from a single burial, and all specimens have very good workmanship. The mean W/T ratio of these specimens is 4.4 compared to a mean W/T ratio of 2.7 for other dart points from this site that are not associated with burials, but instead appear to be associated with subsistence activities. It is concluded that these Ellis points were specially made for use as grave goods, with much care being given to workmanship. Also, these specimens do not appear to be made of local chert types, which means that special care was used in material selection.

## SUMMARY

This article has discussed various factors that can affect the W/T ratio of a dart point. In general, Indians seem to have desired thin dart points with high W/T ratios. It is concluded that dart point style and lithic raw matetial quality are important factors that can affect the W/T ratio of a finished dart point. Archaeological data used here show that dart points from Central Texas made from high quality cherts have higher W/T ratios than dart points from Southeast Texas made from tough local cherts of the lower Colorado and Brazos River Basins. This study has been made as an aid in understanding some of the variables that affect the manufacture of chert dart points.

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CONSTITUTION AND BY-LAWS
OF THE
# SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION
(as amended December 9, 1997)

## Article I

The name of this "Association" shall be:
"The Southern Texas Archaeological Association."

## Article II

(a) The purpose of this Association shall be to bring together persons with an active interest in the archaeology and prehistoric heritage of Southern Texas in an atmosphere conducive to the exchange of information and ideas;

(b) To promote scientific archaeological investigation and documentation;

(c) To preserve the archaeological materials and records of the region;

(d) and to interpret and publish data attendant thereto.

## Article III

(a) Membership shall be extended to all persons who are in agreement with the purposes of the Association and by payment of the prescribed annual dues.

(b) All members shall agree to abide by the following statement of ethics:

"I pledge that I will not intentionally violate the terms and conditions of any Texas Antiquities Statutes, as same now exist, or shall be hereafter amended or enacted, or engage in the practice of buying or selling artifacts for commercial purposes or engage in the willful destruction or distortion of archaeological data or disregard proper archaeological field techniques."

(c) Meetings shall be held four times per year at a location designated by the Board of Directors, and the Board of Directors will be empowered to call special meetings when necessary.

## Article IV

The government of the Association shall be vested in a Board of Directors consisting of the following officers: Chairman, Vice-Chairman, Secretary, Treasurer, Newsletter Editor and Program Chairman; and the Immediate Past Chairman as well as additional Board members consisting of the chairmen of appointed committees in existence at the time of any regular or special meeting.

A Nominating Committee shall be appointed by the Chairman not less than thirty days prior to the annual business meeting.

## Article V

The officers shall be elected by popular vote annually and will serve for one year. The first meeting of the calendar year will be the annual business meeting, at which time officers will be elected and take office. In the event any of the Directors cannot serve after elected, the Board will appoint a member to serve the remaining term of office.

Article VI

This Constitution and By-Laws may be amended by a majority vote of the members present at any business meeting, provided the membership has been notified at least thirty days prior to the meeting of intention to amend and the nature of the proposed amendment.

## BY-LAWS

Article I

Membership categories will be as follows:

Corporate
Supporting
Contributing
Family
Active/Institution
Student (full-time, up to age 23)

Dues as estalished by Board of Directors

Renewals for current year not paid by end of March will be considered delinquent and a $1.50 charge in addition to membership dues will be requested in order to mail prior publications for current year. Delinquent members will not be permitted to participate in Association activities.

New membership dues are payable at any time and will receive all prior publications for current year without incurring the $1.50 charge.

Article II

Officers must be members in good standing.

Article III

(a) Expenses of the Association will be delineated in an annual budget which will be approved by the Board.

(b) The Chairman shall not authorize any non-budgeted expenditure in excess of $50.00 without approval of the Board.

Article IV

The Chairman will appoint committees at such time that committees are deemed necessary. All committees appointed by the Chairman shall cease to exist upon the expiration of that Chairman's term of office unless specifically requested to continue their organization and purpose by the Chairman Elect.

Article V

Special awards may be determined by the Board.

# AUTHORS

JAMES BRYAN BOYD is a police officer holding an Intermediate Peace Officer's License and an Instructor's License with the Texas Commission on Law Enforcement Officer Standards and Education. He is also a Regional Steward for the Office of the State Archeologist, Texas Historical Commission in Austin. Boyd is currently recording sites along the Rio Grande, in both the Falcon Reservoir area and the Trans-Pecos region. He has made over 650 expeditions into the field and has written nearly 50 papers on various archaeological topics.

KEN BROWN is a PhD student of anthropology at the University of Texas at Austin and working on staff at the Texas Archeological Research Laboratory (TARL) there. He has been a contributor to *La Tierra* many times, with a variety of interesting subjects relating to archaeology. His address is: TARL, PRC Bldg. 5, 10100 Burnet Rd, Austin, Texas 78712-1100.

C. K. CHANDLER, Documentation Chairman of STAA, is a charter member of STAA and a Past President of the Texas Archeological Society (TAS) and also of the Houston Archeological Society. He was the 1985 Robert F. Heizer Award winner for his extensive work in South Texas archaeology. C. K. is a valued contributor of manuscripts to *La Tierra* and the *Bulletin of the Texas Archeological Society*, He has been honored by being named a TAS Fellow, and is an archeological steward for the Office of the State Archeologist (OSA).

MICHAEL B. COLLINS is Associate Director of the Texas Archeological Research Laboratory at the University of Texas at Austin. Dr. Collins is a welcome return contributor to *La Tierra* after a too-long hiatus.

NORMAN G. FLAIGG has been an STAA member for 22 years, and has had a lifelong interest in archaeology, starting with collecting artifacts on his father's ranch in South Dakota. He has participated in 16 TAS field schools, as well as several STAA field schools. His many written contributions to the TAS Newsletter have been enjoyed by all. This is his fourth contribution to *La Tierra* during his membership years. His recent untimely death has saddened his many friends. Please see page 44 also.

LELAND W. PATTERSON is a retired chemical engineer and an active avocational archaeologist. His current research interests include the prehistory of southeast Texas, lithic technology, and the early peopling of the New World. Patterson has authored or coauthored over 379 publications in archaeology. Some of his publications have been in *American Antiquity, Journal of Field Archaeology, Lithic Technology*, the *Bulletin of the Texas Archeological Society*, and *Current Research in the Pleistocene*. He is author or senior author of several major archaeological site reports, and has recently published a detailed synthesis of Southeast Texas archaeology. He has received the Crabtree Award of the Society for American Archaeology for research by an avocational archaeologist.

# INFORMATION FOR CONTRIBUTORS

*La Tierra* publishes original papers and selected reprints of articles involving the historic and prehistoric archaeology of southern Texas and adjacent regions. Original manuscripts are preferred. Articles involving archaeological techniques, methods, and theories are also considered.

The main objective of this quarterly journal is to provide a way for STAA members and others interested in the archaeology of southern Texas to share the information they have with others. We encourage your full participation through submission of your information for publication; we are particularly interested in receiving manuscripts from those in the less well-known counties of our region, to document even surface finds and old collections. Only through such total member participation can we, as a group, build up a comprehensive picture of the archaeology of our area!

Articles may be submitted in any form, although **double-spaced** typed copy is naturally preferred. However, we will review and work with material in any form to encourage those not comfortable with typewritten or other formal methods; WE ARE MORE CONCERNED THAT YOU SUBMIT YOUR IDEAS AND DOCUMENT YOUR MATERIALS THAN WE ARE WITH THE FORM OF MATERIALS WITH WHICH WE HAVE TO WORK. If you can supply a 3 ½" disk, IBM or compatible, in ASCII form (if not in Word Perfect or Word), it will be very helpful.

We are now incorporating a small Texas map with the county represented down in the lower right-hand corner of Page 1. This is not "Figure 1" and it may be all that you want in your paper. However, if you are being more precise as to your area of Texas, please submit a map showing the general region with rivers, streams, etc. This would be Figure 1. We are trying not to be too precise with locations of sites—unfortunately there are those who take advantage of this information to locate and ravage archaeological sites. Those sites already in the published material are sometimes shown again, however. Also, you MUST have the landowner's permission before entering his property. This small consideration can avoid misunderstanding and ill feeling toward archaeological research.

Other figures can be line drawings or photographs; line drawings are preferred if they are good quality—every photograph used requires special processing which adds to the cost of the issue. Sharp Black and White photos are preferred but color can be used. If you need assistance with illustrations, please let us know—there are several STAA members who have volunteered to help with illustrations. For examples of good artifact and map illustrations, see those by Richard McReynolds and Ken Brown in previous issues.

When drawings or sketches of artifacts are included in your manuscript, please give the name of the artist responsible for the illustration(s). All figures should contain an appropriate caption and, where necessary, identification of each specimen (a, b, etc. or 1, 2, etc.) to aid referencing individual specimens in the text. The suggested procedure is to photocopy your original drawing and write in captions and identification letters on the photocopy. This saves the original for our use in final preparation of camera-ready copy.

PLEASE include a proper scale on all maps, diagrams, artifacts, etc. When any figure must be reduced, the scale must be in the original figure so that reduction will not change any proportions. Most of our artifact figures are drawn "actual size" but this is not proper publishing terminology. A scale is necessary, and may be reset in the picture through "cut and paste"—just so it is there. Remember that photocopied material is very often slightly enlarged, and care must be taken that there is no change in the scale if done separately. For area (regional) maps, a small "rake scale" will help in our final copy—just so it is the proper dimension. Any site excavation map MUST have a good scale with it, again, IN the map so that reduction will not change the proportions.

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# THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION

The Southern Texas Archaeological Association brings together persons interested in the prehistory of south-central and southern Texas. The organization has several major objectives: To further communication among avocational and professional archaeologists working in the region; To develop a coordinated program of site survey and site documentation; To preserve the archaeological record of the region through a concerted effort to reach all persons interested in the prehistory of the region; To initiate problem-oriented research activities which will help us to better understand the prehistoric inhabitants of this area; To conduct emergency surveys or salvage archaeology where it is necessary because of imminent site destruction; To publish a quarterly journal, newsletters, and special publications to meet the needs of the membership; To assist those desiring to learn proper archaeological field and laboratory techniques; and To develop a library for members' use of all the published material dealing with southern Texas.

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