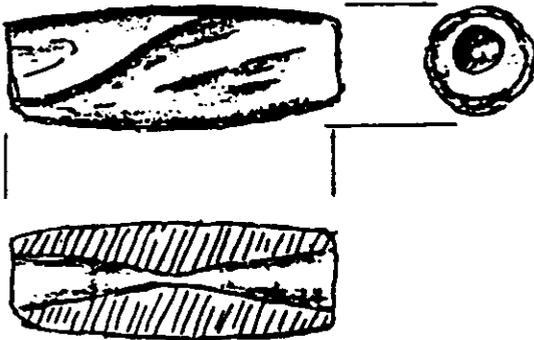




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Contents

| | |
|---|----|
| Environmental Analysis of Freshwater Mussels from the A. C. Saunders Site (41AN19) Raymond W. Neck | 1 |
| The Hranicky Site, 41FY516, Fayette Co., Texas L. W. Patterson and J. D. Hudgins | 6 |
| Vertebrates of the J. D. Wells Site, 41HR639 W. L. McClure | 11 |
| Prehistoric Bison in Southeast Texas Leland W. Patterson | 14 |
| Burials with Marine Shell Grave Goods at 41WH44, Wharton Co., Texas W. Marshall Black, L. W. Patterson, and Rebecca Storey | 20 |
| Site 41CH290, A Multi-Component Shell Midden, Chambers Co., Texas L. W. Patterson and C. R. Ebersole | 25 |

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Environmental Analysis of Freshwater Mussels from the A. C. Saunders Site (41AN19)

Raymond W. Neck

Houston Museum of Natural Science

Freshwater mussels are often found within archeological sites associated with a body of fresh water. The animal may provide nutrition while the shell may function as a raw material resource to be utilized for manufacture of ornaments and tools (Matteson 1953; Parmalee and Klippel 1974). Analysis of a mussel fauna from an archeological site may reveal dietary preferences, habitat exploitation, and general environmental data. A total of 527 valves (almost all entire) representing 16 species from the A. C. Saunders Site (41AN19) have been examined; three valve fragments remain unidentified.

The Saunders Site is located in northeastern Anderson County, Texas, on the Neches River just below the dam of Lake Palestine, approximately ten kilometers east of Frankston. This site represents a late Neoamerican culture from protohistoric time, i.e., ca. 1700 A.D. The A. C. Saunders Site was excavated by A. T. Jackson (1936), who believed that it represented the remains of a Caddoan fire temple. Suhm et al. (1954:184-189) included the A. C. Saunders Site as the type site of what was then termed the Late Caddoan Frankston Focus (now considered the Frankston Phase) dated by the occurrence of Perdiz points. Subsequent analysis (Kleinschmidt 1982) characterized this site as a ceremonial center, possibly a perpetual fire temple as believed by Jackson (1936). The freshwater mussel shells analyzed herein represent a "single dumping event" according to Kleinschmidt (1982).

Species list

Below is an annotated list of the species containing comments on the significance of various forms. Also included (in parentheses) is a count of left and right valves, respectively.

Amblema plicata (Say, 1817). (42, 53). The three-ridge mussel is widespread geographically, occurring in the Mississippi, St. Lawrence, and Gulf drainages (Burch 1975). In Texas this species is widespread in free-flowing rivers and artificial impoundments. The smallest valve in the collection is only 30.9 mm long; one large fragment represents an individual which was between 110 and 120 mm in length.

Fusconaia askewi (Marsh, 1896). (49, 48). The nomenclatural status of this form is still unclear (Parodiz 1967). As used here this taxon is restricted to eastern Texas in drainages with moderate to large amounts of slightly to moderately acidic waters.

Plectomerus dombeyanus (Valenciennes, 1833). (71, 81). This species is found in flowing waters of the Gulf Coast drainages including the lower Mississippi River (Burch 1975).

Quadrula pustulosa (Lea, 1831). (1, 0). This species is reported from the entire Mississippi drainage and several of the Great Lakes (Burch 1975), as well as the eastern part of Texas (Strecker 1931). Many, if not most, of the Texas specimens differ from the classical type of *Q. pustulosa*, however, and have been suggested to fall within the limits of *Quadrula nodifera* (see Roback et al. 1980). However, the single valve present in the Saunders Site collection is a medium-sized individual closely resembling the classic *pustulosa* phenotype.

Quadrula quadrula (Rafinesque, 1820). (3, 4). Shells referred to this taxon include a bewildering array of phenotypes (Neel 1941). A portion of the variation is due to the wide geographical ranges, which span most of the Gulf drainages (including the entire Mississippi River drainage), in addition to the Great Lakes and the Red River of the North (Burch 1975). However, Roback et al. (1980)

have utilized a more modern approach which admits the existence of at least two species of the *Q. quadrula* complex. Most Texas specimens are referable to *Q. apiculata* (see next species discussion). However, several specimens from the A. C. Saunders Site are classical *Q. quadrula* (*sensu stricto*). This form in Texas is apparently restricted to the easternmost rivers where it is generally rare.

Quadrula apiculata (Say, 1829). (1,1). This taxon as used here includes most members of the *Q. quadrula* complex in Texas. This species is known from moving water in free-flowing rivers but becomes extremely abundant in artificial impoundments.

One large, eroded valve somewhat resembles *Quadrula metanevra* (Rafinesque, 1820), which is generally considered to be restricted to the upper part of the Mississippi River and tributaries (Burch 1975). One literature record for Texas exists: Read (1954) reported *Q. metanevra* from a gravel substrate in the Elm Fork of the Trinity River in Dallas County where it was considered to be rare. No specimens have been located in the Dallas Museum of Natural History collections, and Strecker (1931) had no records for this species in Texas. As no records subsequent to Read (1954) have been forthcoming, his record is best considered to be an aberrant and/or pathogenic *Q. apiculata*.

Tritogonia verrucosa (Rafinesque, 1820). (23, 15). This species is generally found in flowing waters in the Mississippi and Gulf Coast drainages.

Megaloniaias nervosa (Rafinesque, 1820). (1, 0). This mussel occurs throughout the Gulf drainages southwestward into Mexico (Simpson 1914). Generally found in relatively deep water (five meters or deeper) in flowing streams, this species was represented by a single fragment.

Unio merus tetralasmus (Say, 1831). (4, 1). This wide-ranging species occurs throughout the Gulf drainages, entire Mississippi drainage, and the lower Atlantic slope (Johnson 1972). This species is normally found in the slow-moving waters of backwater sloughs and nonmoving waters of ponds. *U. tetralasmus* even inhabits temporary waters, because it is able to withstand long periods of desiccation.

Toxolasma parvus (Barnes, 1823). (3, 1). This small species is known from essentially all of the Mississippi River from New York to Minnesota, and south to the Gulf Coast from northern Florida to northern Mexico (Burch 1975). Found on various substrates, *T. parvus* is characteristic of shallow water and is often abundant in small stock ponds.

Lampsilis hydiana (Lea, 1838). (29, 34). This taxon is known from the Coastal Plain of Gulf drainages west of the Mississippi and portions of the lower Mississippi River (Valentine and Stansbery 1971). *L. hydiana* is found on soft substrates in gently flowing water but has readily adapted to recent artificial impoundments.

Lampsilis satura (Lea, 1852). (0, 1). This taxon is restricted to eastern Texas and western Louisiana. *L. satura* is a rare species which is generally found in sandy substrates.

Lampsilis teres (Rafinesque, 1820). (27, 25). This wide-ranging species occurs from Florida westward into Mexico. *L. teres* is usually found on soft substrates.

Potamilus purpuratus (Lamarck, 1819). (1, 0). This mussel is found from central Texas eastward to Alabama and northward to western Tennessee and Kansas (Simpson 1914). The single valve recovered is typical of shells from the inland portion of the Coastal Plain of Texas. Farther downstream on the lower Coastal Plain, *P. purpuratus* shells are smaller, more obese, and longer relative to height.

Obliquaria reflexa Rafinesque, 1820. (1, 0). This species occurs throughout the Mississippi drainage and either direction along the Gulf coast (Burch 1975). *O. reflexa* is generally found on gravel bottoms in relatively fast moving water.

Ecological setting

Essentially all of the species listed above indicate a medium-sized body of shallow, moving water. Most of these species have been found in the Neches River of today slightly downstream from the A. C. Saunders Site (Texas 21 crossing near Alto, Neck unpublished data). The most likely substrate is soft sand, mud, and various combinations of these particle sizes. No indication of large-scale areas of gravel substrate is given.

The presence of two species (each represented by limited numbers of shells) indicates the possibility of exploitation of several microhabitats of the Neches River. *Uniomerus tetralasmus* is typical of slow-moving or stagnant backwater and temporary ponds. *Megalonaias nervosa* occurs in deep pools of moving waters. The presence of both of these species could result from utilization of flood debris valves transported some distance downstream from proper microhabitat.

Another possible indication of exploitation of multiple microhabitats has been observed. Most of the shells exhibit a variable amount of acid etching in the umboral region of the valve. Such etching is the result of exposure to acidic waters. Much variability in susceptibility to acid etching exists between species; such variability is immediately obvious in the sample from the A. C. Saunders Site. Some variation in degree of acid etching is observable among individuals of the same species, however. Such intraspecific variation could result from genetic variation concerning shell deposition or from local environmental factors which increase the acidity of the immediately surrounding water. In an actively moving stream, areas of increased water acidity may develop in backwater areas or shallow pools which are separated from the river proper during low water periods (generally during the summer).

The mere presence of mussel shells at the Saunders Site is significant. Most soils in eastern Texas are too highly acidic to allow preservation of calcareous objects, i.e., shell and bone. In a study of the nutrient resources of the Davis Site (somewhat downstream from the Saunders Site near the Neches River), Keller (1974) reported no evidence of utilization of freshwater clams. That this general lack of molluscan remains is probably the result of soil acidity is indicated by the clams analyzed by Neck (1979). The clams reported therein came from a localized area of artificially alkalized soil (as a result of infusion of high density of ash) which allowed preservation of the shells. Preservation of the shells from the Davis Site was of somewhat lower quality than of those recovered from the Saunders Site.

Analyses of clams from other archeological sites in the general vicinity of the Saunders Site were given by Cheatum and Flook (1974), who identified clams from archeological sites within Lake Palestine (somewhat upstream from the Saunders Site). Considering differences in nomenclature, essentially the same fauna was reported from these sites.

Several shells showed evidence of modification as tools. Some merely showed wear patterns along the shell periphery, indicating utilization as a scraping tool. Other shells exhibit a hole through the shell. Some of these holes are reasonably round through a portion of strong shell; such shells show signs of obvious human modification. Other shells have large, basically round but somewhat irregular holes in the general area somewhat ventral to the umbo. Particularly given the location of the hole in a naturally weakened area of shell, such holes could result from penetration by plant roots during a period of interment.

Several valves of *L. teres* were modified for use as scraping or digging tools. The modified shells are a nonrandom selection (with respect to left/right valve) of the total sample of *L. teres* shells found in the Saunders Site. The modified shells include one left valve and eight right valves, but the general sample includes equivalent amounts of the two valves (27 left and 25 right). This nonrandom sample may or may not indicate a proclivity for usage by a particular hand. Little more can be said until the method of utilization is known.

Certain freshwater mussel species exhibit sexually dimorphic shells; *L. teres* is one of these species. Of the nine modified shells seven are male shells while only two are female shells. The general sample exhibits a nearly equal presence of sexes (29 male and 23 female). The significance of this difference lies in the difference of shell morphology between sexes. Male shells are thinner with a tendency for a dorsal projection on the posterior end. This projection has been accentuated by the tool-making process. Apparently less modification is required of a male shell.

Only two valves (of a total of 527) are burnt. Both shells represent young individuals of a moderate-sized species. Included are a 43.2 mm long valve of *Tritogonia verrucosa* and a 77.9 mm long valve of *Plectomerus dombeyanus*.

Several clam species that are not present in the Saunders Site fauna but occur in the general area may also allow further interpretations of human utilization patterns. *Villosa lienosa* (Conrad, 1834) has rather small shells; lack of shells in this sample may indicate a lower size limit for utilization by humans (note that *Toxolasma parvus* and small *Amblema plicata* and *Tritogonia verrucosa* from this collection are of similar size). Neither *Anodonta grandis* Say, 1829, nor *Anodonta imbecillis* Say, 1829, occurred in this faunal sample. Both of these species are rather thin shelled and may have shorter subterranean life times in acidic soils. However, Murray (1982) has observed repeated absence of these species from archeological sites even when other thin-shelled species were present, and postulated a recent geographical expansion of these species.

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The Hranicky Site, 41FY516, Fayette Co., Texas

L. W. Patterson and J. D. Hudgins

Introduction

This article gives a description of a surface collection from prehistoric site 41FY516 in Fayette County, Texas. A description of the site is also given. The artifact collection was made by the landowner, George Hranicky, and the collection is now in the Schulenberg Historical Museum. This study was done as part of the Archeological Stewardship Program of the State Archeologist. The Museum Director, Karen Wolters, advised the State Archeologist that this collection was available for recording, as representing a specific archeological site. The Archeological Steward for this region, Joe Hudgins, then arranged with Mr. Hranicky to view the collection and the site.

Site 41FY516 represents a long preceramic occupation sequence during the Late Paleo-Indian and Archaic time periods. The site is located a few miles west of Schulenberg in the southeastern part of Central Texas.

Site description

Site 41FY516 is approximately 150 feet in diameter. It is located on a high terrace above the flood plain of a creek that is a tributary of the Navidad River. The site is several hundred feet from the creek. At the time of occupation, the creek may have been located nearer to the site. At the present time, most of the surface of this site is covered with grass. There are some bare areas, however, where there are indications of much lithic manufacturing activity, in the form of chert flakes and debris.

The stratigraphy of this site appears to be extensively deflated, due to plowing and erosion. Projectile points from several time periods were found on the surface.

Artifact collection and chronology

Dart point types found at site 41FY516 represent a long occupation sequence in the Late Paleo-Indian (8000–6000 B.C.) and Archaic (6000 B.C.–A.D. 750) time periods. The chronology for time periods used here is for Central Texas (Prewitt 1981). The Archaic period in Central Texas is longer than in adjacent Southeast Texas, because the use of pottery started earlier in Southeast Texas than in Central Texas. No ceramics or arrow points have been found at site 41FY516 to indicate occupations in later time periods, after the Archaic.

A summary of dart points found at this site is given in Table 1. This covers the entire collection, including artifacts on display at the museum and other artifacts at the museum that are not on display. In this article, some of the projectile points have been classified differently than given on the museum display labels.

The Late Paleo-Indian period (8000–6000 B.C.) is represented at this site by Angostura and miscellaneous lanceolate points. One miscellaneous lanceolate point resembles a very wide Plainview point. The Early Archaic period (6000–2600 B.C.) is shown at site 41FY516 by Early Triangular (Figure 1A,B) and Uvalde (Figure 1C) point types, using temporal placements given by Turner and Hester (1985) and Prewitt (1981). The dart point specimens classified here as Early Triangular could alternately be classified as Tortugas, from the Middle Archaic period. The distinction between Early Triangular and Tortugas points is not always clear (Turner and Hester 1985:89).

The Middle Archaic period (2600–250 B.C.) is represented at this site by Bulverde, Marshall, Travis, and Pedernales point types. One Marshall point specimen has a reworked blade section. Gary, Kent, and Palmillas points found at site 41FY516 could represent both the Middle and Late Archaic periods. These point types were made for long time intervals in Southeast Texas (Patterson 1983a: Table 1).

Several dart point specimens (Figure 2) were classified in the museum display as the Travis type. For this article, these specimens have been reclassified as one Darl (Figure 2E), three Travis (Figure 2A,B,D), and three Kent (Figure 2C,F,G). The distinction between Kent and Travis point types is not always clear, but Travis points tend to have more rounded shoulders (Suhm and Jelks 1962: Plate 126) than Kent points.

The Late Archaic period (250 B.C.–A.D. 750) is represented at this site by Darl, Ensor, Fairland, and Montell dart point types. Montell points found at this site are shown in Figure 3. All of the point types found at site 41FY516 are well known in the southern part of Central Texas. Most of these point types also occur slightly farther east, in the western portion of Southeast Texas, except for Montell and Uvalde point types. Data from this site indicate that there is a rather pronounced eastern limit to the geographical distributions of Montell and Uvalde points. These point types have not been found in Austin and Wharton Counties at the western edge of Southeast Texas, which is only 50 miles east of site 41FY516.

Other lithic artifacts

The museum collection for site 41FY516 consists mainly of projectile points and preforms, but there are also single specimens of a hammerstone and a bifacial drill (perforator). A thick chert flake with a denticulate edge, indicating a sawing function, was found during the visit to the site. There was evidence at the site of extensive lithic manufacturing activities, in the form of chert flakes, split chert cobbles, an unworked cobble, and miscellaneous chert debris. The hammerstone and dart point preforms in the artifact collection are also evidence of lithic manufacturing at this site. All artifacts at this site were made from local chert types. Fayette County has extensive alluvial deposits of chert cobbles.

Two specimens classified as Refugio points in the museum collection have been reclassified here as preforms.

Conclusions

Site 41FY516 was probably a seasonal campsite used by nomadic hunter-gatherers over a long occupation sequence. The reuse of this site is similar to that of many sites in adjacent Southeast Texas. The continued reuse of sites may indicate a scheduled subsistence pattern (Patterson 1991). Much lithic manufacturing activity is evident at site 41FY516, which would be expected for a site in Fayette County where abundant lithic resources are available.

This site appears to be the location farthest east reported so far for the occurrences of Uvalde and Montell dart points. The reasons are not clear for this specific eastern limit in the distribution of these two point types. Several other Central Texas point types, such as Pedernales and Fairland, occur somewhat farther east in the western portion of Southeast Texas (Patterson 1983: Table 1). A possibility to consider would be that the eastern limit of occurrence for Montell and Uvalde points might represent the eastern limit for high visibility of bison during the time periods when these point types were used. Another possibility is that Uvalde and Montell points at site 41FY516 are simply outliers from the main areas of distribution of these point types.

Site 41FY516 is a good example of the addition of significant information to the regional data base by the recording of a surface collection.

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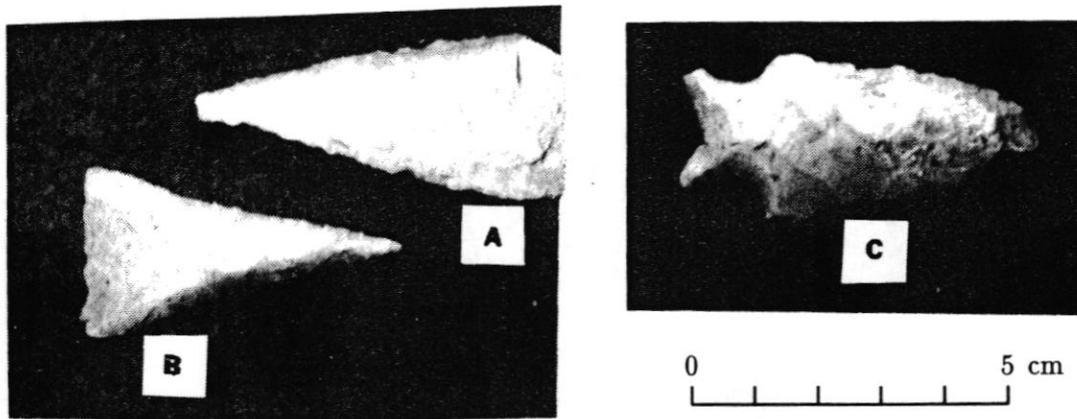
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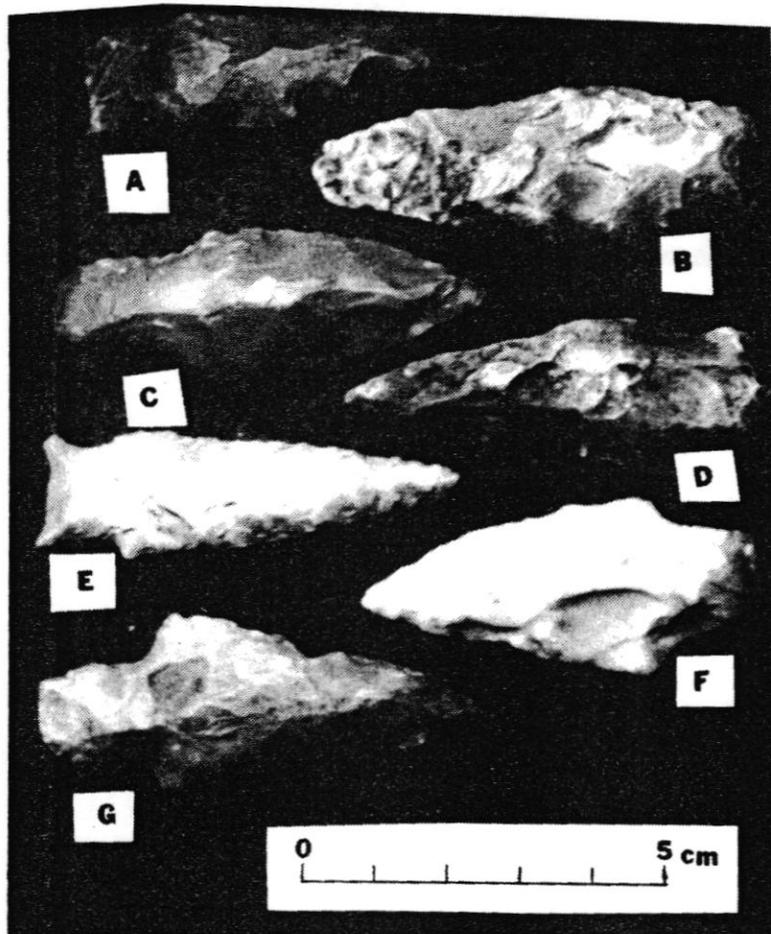
Table 1. Site 41FY516 Projectile Points

| type | no. | time period |
|--------------------------|-----|----------------------|
| Angostura | 2 | Late Paleo-Indian |
| miscellaneous lanceolate | 2 | Late Paleo-Indian |
| Uvalde | 1 | Early Archaic |
| Early Triangular | 2 | Early Archaic |
| Bulverde | 20 | Middle Archaic |
| Pedernales | 14 | Middle Archaic |
| Marshall | 3 | Middle Archaic |
| Travis | 3 | Middle Archaic |
| Kent | 3 | Middle, Late Archaic |
| Gary | 2 | Middle, Late Archaic |
| Gary-like | 1 | Middle, Late Archaic |
| Palmillas | 7 | Middle, Late Archaic |
| Montell | 2 | Late Archaic |
| Darl | 3 | Late Archaic |
| Ensor | 16 | Late Archaic |
| Fairland | 2 | Late Archaic |
| unclassified points | 11 | |
| dart point preforms | 14 | |
| dart point fragments | 14 | |



A,B - Early Triangular points; C - Uvalde point

Figure 1. Early Archaic points



A,B,D - Travis; C,F,G - Kent; E - Darl

Figure 2. Dart points

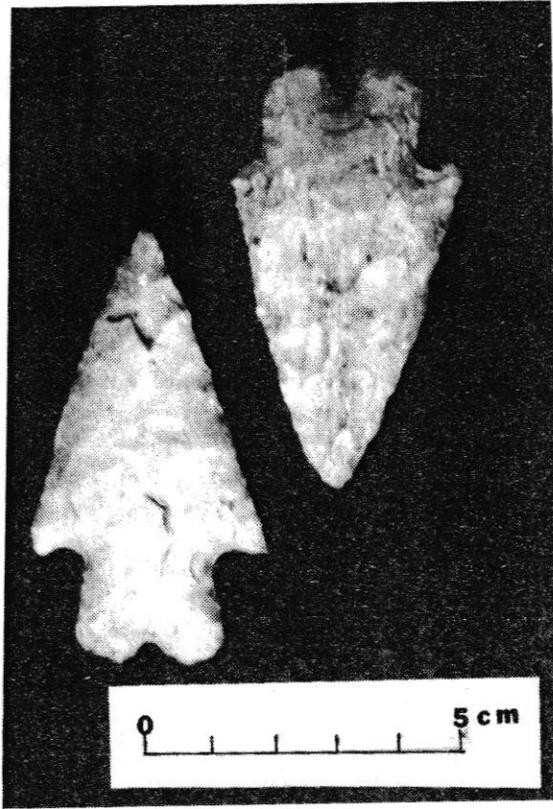


Figure 3. Montell points

Vertebrates of the J. D. Wells Site, 41HR639

W. L. McClure

Introduction

The J. D. Wells Site (41HR639) is on a pimple mound located near the west bank of Cedar Bayou, about 12 miles inland from Galveston Bay in Harris County, Texas. The site was excavated by members of the Houston Archeological Society. Based on the analyses of ceramics and lithics, the site was occupied during the Early Ceramic and the Late Prehistoric time periods (Patterson 1990).

All soil from excavation of five pits was passed through 1/4-inch mesh screens. A discussion of the vertebrate remains is presented here.

Methods

The vertebrate materials from this site were identified by direct comparison with bones and scales of known animals that are in the comparative collections of the Houston Archeological Society and of the author.

Results

The vertebrate remains that were recovered include more than 2800 bones and fragments of bones with a total weight of about 3 kg. The only complete bones are the smaller, more compact elements. Condition of the bones is good, although most had been exposed to fire. The soil filling some of the hollow bones appeared to have been baked in place, and all bones were coated with a very resistant stain which suggests that the matrix had been exposed to repeated fires after the bones had been discarded.

One modified bone (Figure 1) was recovered from Pit E between 20 and 25 cm. It is highly polished and had a sharp point that was lost during recovery. It was made from the posterior part of a metatarsal of a deer.

Only 12 bones and scales of fish were recovered. Reptile remains include 11 alligator bones, 361 turtle bones, and 7 snake bones. Three bird bones could not be identified as to species. There were 303 mammal bones. More than 2100 bones could not be assigned to a particular animal group.

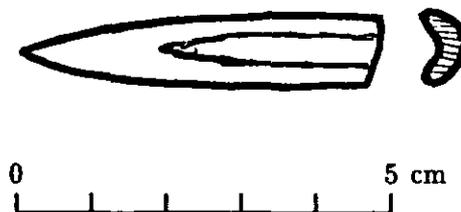


Figure 1. Bone tool

Species List

| | |
|---|------------------------|
| <i>Atractosteus</i> or <i>Lepisosteus</i> sp. | Gar |
| genus unknown | unidentified fish |
| <i>Alligator mississippiensis</i> | Alligator |
| <i>Kinosternon subrubrum</i> | Mississippi mud turtle |
| <i>Terrapene carolina</i> | Three-toed box turtle |
| <i>Trionyx</i> sp. | Softshell |
| <i>Nerodia</i> sp. | Water snake |
| <i>Crotalus</i> sp. | Rattlesnake |
| <i>Agkistrodon piscivorus</i> | Cottonmouth |
| genus unknown | unidentified bird |
| <i>Didelphis virginiana</i> | Opossum |
| <i>Sylvilagus aquaticus</i> | Swamp rabbit |
| <i>Sylvilagus floridanus</i> | Cottontail |
| <i>Procyon lotor</i> | Raccoon |
| <i>Muster vision</i> | Mink |
| <i>Odocoileus virginianus</i> | White-tailed deer |

Species accounts

Fishes:

Eight vertebrae and a head bone fragment of gar (*Atractosteus* or *Lepisosteus* sp.) were recovered. Three vertebrae of two other varieties of fish were also found but can not be identified.

Reptiles:

Eleven alligator (*Alligator mississippiensis*) dermal bones were recovered. Turtle bones of the carapace and plastron are 7 of the Mississippi mud turtle (*Kinosternon subrubrum*), 156 of the three-toed box turtle (*Terrapene carolina*), 2 of the softshell turtle (*Trionyx* sp.), and 188 of unidentified turtles. The snake vertebrae that were recovered are 1 from water snake (*Nerodia* sp.), 2 from rattlesnake (*Crotalus* sp.), and 4 from cottonmouth (*Agkistrodon piscivorus*).

Birds:

Bones of an unidentified bird are cervical vertebra, pelvis, and terminal phalanx.

Mammals:

Bones of the opossum (*Didelphis virginiana*) are a maxilla, 3 mandibles, 4 isolated teeth, atlas, 7 other vertebrae, scapula, 2 humeri, ulna, femur, and 3 innominates.

Swamp rabbit (*Sylvilagus aquaticus*) bones are maxilla, 2 radii, 2 innominates, and tibia. Cottontail (*Sylvilagus floridanus*) bones are maxilla, 2 mandibles, 3 cheek teeth, scapula, humerus, innominate, tibia, and astragalus.

A mandible of the mink (*Muster vision*) was recovered. Raccoon (*Procyon lotor*) bones include a maxilla, 2 mandibles, and 5 teeth.

White-tailed deer (*Odocoileus virginianus*) bones include 8 antler fragments, 13 mandibles, 56 isolated teeth, 6 petrous bones, scapula, 6 humeri, 6 vertebrae, 6 ribs, 6 radii, 6 ulnae, 2 innominates, 7 femora, patella, 11 tibiae, 3 malleoli, 6 astragali, 11 calcanei, unciform, pisiform, lunar, 2 scaphoids, 3 trapezoid magna, 5 centroquartals, tarsal, 3 sesamoids, 5 metacarpals, 32 metatarsals, 18 metapodial condyles, and 26 phalanges. Two of the larger antler fragments included the pedicle and part of the skull. One of these had the edges of the skull bone with the appearance of impact as if having been used as a hammer.

The 2139 unidentified bones could not be assigned to a particular animal but most of them are of such morphology that they may be from deer.

Discussion

All of the animals that were identified from the bones are known from the area today. The variety of fish, reptiles, and mammals that were recovered from the excavations indicates that the occupants were using the available vertebrates as food resources. The softshell turtle appears only in the Early Ceramic occupation levels and the snake and mink remains are only in the Late Prehistoric occupation levels. It is probable that these differences in recovered taxa would be eliminated if some of the matrix had been subjected to screening through finer mesh. The primary food item was the white-tailed deer, with turtles being next in frequency.

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Prehistoric Bison in Southeast Texas

Leland W. Patterson

Abstract

Data are presented on bison remains found at archeological sites in Southeast Texas, and on the relative importance of bison in the diet of Indians in this region. A critical discussion is given on Huebner's (1991) proposed bison migration corridor between the Colorado and Brazos Rivers. The rarity of Folsom points in Southeast Texas is considered, as a result of possible low bison concentration in this region during the terminal Pleistocene.

Introduction

The archeological record does not indicate that bison were ever present in Southeast Texas in large numbers. Faunal remains at archeological sites do indicate, however, that some bison were present in this region, at least occasionally, during most prehistoric time periods. Reasons for the relatively low visibility of bison in Southeast Texas are discussed here in terms of environmental factors and poor preservation of faunal remains. The relative importance of bison, compared to other faunal resources, in the diet of Indians of this region is also considered.

Dillehay (1974) has proposed that there were periods when the bison was totally absent from the Southern Plains. This will probably never be resolved with any degree of certainty for the southern part of Texas, however, because of poor preservation of faunal remains and limits in accuracy of radiocarbon dating.

Published data on bison remains found at archeological sites in Southeast Texas are summarized here, based on regional computerized data bases (Patterson 1989a,b). These data show that bison remains are not highly visible in the archeological record for this region. The small number of sites with bison remains in the western part of Southeast Texas does not support Huebner's (1991) proposal that a bison migration corridor existed between the Brazos and Colorado Rivers.

There is little evidence for the presence of bison in Southeast Texas during the Late Pleistocene time period. It is noted here that this corresponds to the rarity of Folsom projectile points found in this region.

Environmental setting of Southeast Texas

Southeast Texas is the western end of the Southeast Woodlands. Southeast Texas has a mixture of woodlands and coastal prairie. Before modern disturbance, much of this region was covered with dense woodlands, as can still be seen northeast of Houston. Southeast Texas receives more rainfall than adjacent regions of South and Central Texas. The coastal prairies of Southeast Texas would have been a tallgrass environment during prehistoric time of the Holocene period, except perhaps during drought periods.

The general setting of Southeast Texas is not the widespread shortgrass environment that is usually associated with large bison herds. It could be expected from the environmental setting that any bison present in Southeast Texas would have been in thin, dispersed herds. Archeological data support this conclusion.

The eastern extent of the Folsom culture in Texas

It is known that bison was a major subsistence item for Indians of the Folsom culture, generally placed in a time period of 11,000 to 10,000 years ago. Data given by Munson (1990:Figure 3) for the eastern limit of significant presence of bison in Texas during the Late Pleistocene show a diagonal boundary from Northeast Texas to farther west in South Texas. This eastern limit for bison excludes Southeast Texas. The eastern limit for the distribution of Folsom points in Texas given by Largent et al. (1991:Figures 1,2) corresponds well with the eastern limit of the distribution of bison during the Late Pleistocene.

The rarity of Folsom points found in Southeast Texas appears to correspond with the low level of bison in this region during this specific time period. Only two Folsom points have been reported at sites in Southeast Texas (Patterson et al. 1987; Patterson, Marriott, and Marriott 1990). During this time period from 11,000 to 10,000 years ago, cultural groups other than Folsom occupied Southeast Texas, using Early Side-Notched projectile points. The cultural groups in Southeast Texas at this time appear to have practiced a less specialized type of hunting and gathering lifeway than the Folsom culture. The lifeway of Indians in Southeast Texas during the same time period as the Folsom culture was similar to the Eastern Early Archaic lifeway that was practiced throughout the southeastern United States, from East Texas to South Carolina (Patterson 1991).

An Early Side-Notched point was found at the same excavation level as a Folsom point at site 41WH19 in Wharton County, Texas (Patterson et al. 1987). Slightly farther west in Bee County, Early Side-Notched points were found at an excavation level below a Folsom point (Sellards 1940). Early Notched points have been found at many sites in Southeast Texas (Patterson 1989a). Folsom can no longer be considered as the only projectile point type in Texas during the time period of 11,000 to 10,000 years B.P. (Patterson 1989c).

Evidence of bison in Southeast Texas

Archeological sites in Southeast Texas with bison remains are summarized in Table 1. As would be expected from environmental considerations, evidence of the presence of bison in this region is fairly limited. There is no published evidence for the presence of bison at archeological sites in most of the eastern portion of Southeast Texas, except for four sites on the coastal margin in Chambers County. Much of the eastern part of Southeast Texas is heavily wooded or is marshland, not usually considered as important habitats for bison.

Data in Table 1 show that bison were present, at least occasionally, in Southeast Texas during all time periods from the Late Paleo-Indian (after Folsom) through the Late Prehistoric. These data may indicate a somewhat higher visibility of bison in the Late Prehistoric compared to other time periods, although the data base is too small to be conclusive. Bison was not as important a dietary item for Indians of this region as were other animals such as deer and turtle (Patterson 1989a,b). The proportion of archeological sites in Southeast Texas with data on faunal remains is not high. Therefore, the importance of various types of faunal remains can be considered only on a relative basis. For example, there are four times as many sites with deer remains as with bison remains on the coastal margin of this region (Patterson 1989b).

Comments on Huebner's bison migration model

Huebner (1991:Table 1) has summarized data for the presence of bison in South-Central and South Texas, south of the Balcones escarpment, during the Late Prehistoric time period after A.D. 750. Huebner (1991:354) attributes an increased presence of bison in these areas, during the Late

Prehistoric, to climatic drying which caused a southward migration of bison. Huebner (1991:353) proposed that the migration of bison to South Texas was through a corridor between the Colorado and Brazos Rivers. It was assumed in this model that migration of bison would have occurred on the eastern side of the Balcones escarpment, because this escarpment would have been a significant barrier to bison migration.

Several critical comments can be made on Huebner's (1991) bison migration corridor model, as follows:

- The Edwards Plateau region with the Balcones escarpment may not have been a severe impediment to a directly southern migration of bison from the High Plains.
- The geographic distribution of bison in South-Central and South Texas given by Huebner (1991:Figure 4) for the Late Prehistoric period shows the presence of bison between the Brazos and Colorado Rivers mostly near the Balcones escarpment. Huebner's data for bison in South-Central and South Texas are shown here in Figure 1 together with data from Table 1 for bison in Southeast Texas. These data show only a small number of sites with bison remains in the proposed migration corridor for most of the distance between the Balcones escarpment and the Gulf Coast river mouths. Based on these data, it seems more likely that most of the bison migration into South Texas would have occurred west of the Colorado River. Also, the data in Figure 1 do not indicate any specific migration routes for bison into South and Southeast Texas.
- The concept of major migration of bison into South Texas during the Late Prehistoric can be questioned. In an alternate scenario, climatic change may have resulted in a general increase in bison herd sizes for bison already located in South Texas and adjacent regions.
- Much of the proposed bison migration corridor between the Colorado and Brazos Rivers was heavily wooded, which would not be the usually expected environment for a primary bison migration route.
- Data from Southeast Texas do not support the proposed bison migration corridor. Most of the western part of Southeast Texas is in Huebner's proposed corridor, but sites with bison remains are not numerous in this zone. Huebner (1991:Table 1) lists 65 Late Prehistoric sites in South-Central and South Texas with bison remains. As may be seen in Table 1 in this article, there are only four Late Prehistoric sites with bison remains in the western zone of Southeast Texas.

Summary

Published data for archeological sites in Southeast Texas show that after 10,000 years B.P. bison were present in this region at least on an occasional basis throughout the time interval until protohistoric time (some time after A.D. 1500). The continuing or intermittent presence of bison in Southeast Texas does not appear to have ever been as large herds, but rather as thin, scattered herds. Southeast Texas is a mixture of woodlands and coastal prairie. Bison may have preferentially utilized the coastal prairie areas of this region, which are more numerous in the western half of the region.

The possible scarcity of bison in Southeast Texas during the Early Paleo-Indian period may account for the rarity of Folsom points found in this region.

Huebner's (1991) proposed bison migration corridor from Central Texas to the Gulf Coast between the Colorado and Brazos Rivers is not supported by the geographic distribution of archeological sites with bison remains. It would be difficult to select migration routes from the available data.

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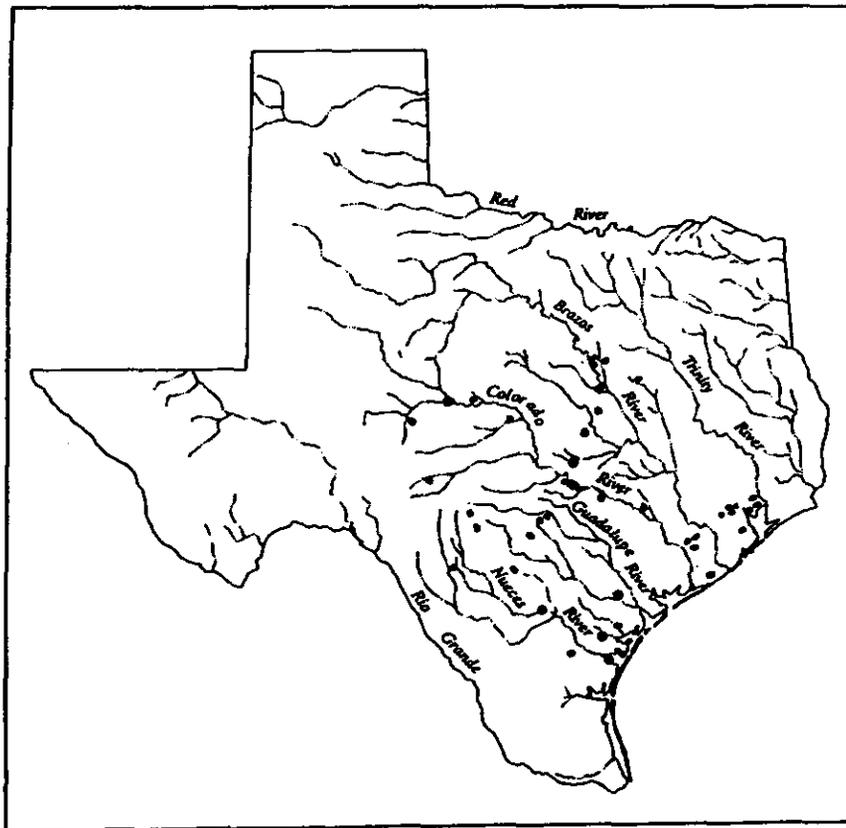


Figure 1. Bison remains in South-Central, South, and Southeast Texas

Table 1. Bison Remains in Southeast Texas

| site and zone | time period(s) | reference |
|------------------------|--|---|
| western inland | | |
| 41AU4 | not determined | Duke 1985 |
| 41FB37 | Early Archaic | McClure 1987a |
| 41FB43 | Late Prehistoric | Patterson and Hudgins 1989 |
| 41FB95 | not determined | McClure 1987b |
| 41WH14 | not determined | Hudgins and Kindall 1984 |
| 41WH19 | Late Paleo, Archaic, Early Ceramic, Late Prehistoric | Patterson et al. 1987 |
| 41WH74 | Late Prehistoric | Patterson, Hudgins, and McClure 1990 |
| central inland | | |
| 41HR5 | Middle Archaic, Early Ceramic, Late Prehistoric | Wheat 1953 |
| 41HR6 | Late Prehistoric | Wheat 1953 |
| 41HR7 | Late Prehistoric | Wheat 1953 |
| 41HR182 | not determined | Patterson 1987 |
| 41HR278 | not determined | McClure 1980 |
| 41HR279 | not determined | McClure 1979 |
| 41HR281 | not determined | McClure 1982 |
| 41HR292 | Late Archaic | McClure 1980 |
| 41HR541 | Late Prehistoric | McReynolds et al. 1988 |
| eastern inland | no sites | |
| western coastal | | |
| 41BO79 | Late Prehistoric | Voellinger and Nash 1989 |
| central coastal | | |
| 41HR39 | not determined | Taylor et al. 1985 |
| 41HR50 | Late Prehistoric | Ambler 1967 |
| 41HR82 | Late Prehistoric | O'Brien 1971 |
| eastern coastal | | |
| 41CH16 | Early Ceramic | Ambler 1967 |
| 41CH31 | Late Prehistoric | Aten 1983 |
| 41CH110 | Late Prehistoric | Gilmore 1974 |
| 41CH172 | Late Archaic | Dillehay 1975 |

Burials with Marine Shell Grave Goods at 41WH44, Wharton Co., Texas

W. Marshall Black, L. W. Patterson, and Rebecca Storey

Introduction

Site 41WH44 in Wharton County, Texas, was originally recorded by J. D. Hudgins in 1981. It was located by examination of topographic highs along the San Bernard River and tributary streams. The site is situated on a prominent sandy knoll on the south side of the San Bernard River. The present landowners, the Gary Krenek family, are preparing the hill for a homesite. Heavy equipment has been used to improve the symmetry of the entire crest. Two to three feet of soil has been graded off a former ridge on the slope toward the river. Heavy rains in the spring of 1991 cut numerous miniature gullies one to two feet wide and up to 100 feet long on this slope. Gary Krenek found human bone fragments in one of the gullies and, through Joe Hudgins, requested that members of the Houston Archeological Society or Texas Archeological Society remove the skeletal material for reinterment elsewhere. Ten members of HAS and TAS responded to this request on April 28, 1991, under the direction of Sheldon Kindall, representing the Texas Archeological Society.

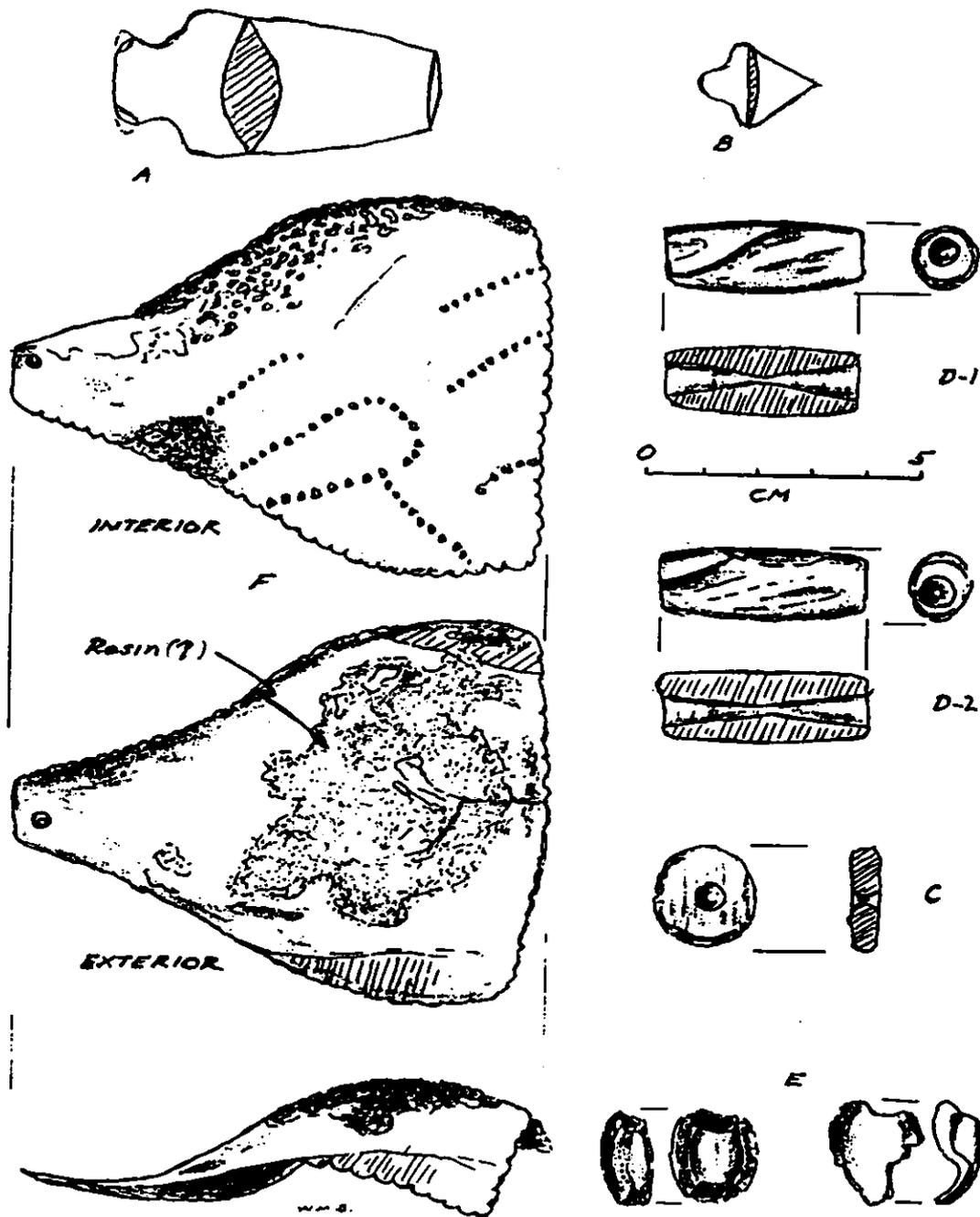
Fieldwork

Burial remains were found at the head of a miniature gully where remaining soil cover would have been about 5 cm, except for the erosion. The burial location is 50 meters from the present river edge. No artifacts were found on the graded surface in the immediate area; however, a deposit of freshwater clam shell was noted about 15 meters from the burial. Deer bone and teeth were noted about 10 meters from the burial. The burial would have been an estimated 50 to 70 cm beneath the original surface. Surface collection from the entire graded area of several acres yielded only a Williams dart point and a Perdiz arrow point, Figure 1A,B, and a few very hard, sandy paste Goose Creek potsherds. Few chert flakes were found. Due to the limited area of this excavation, it was not determined if any additional archeological materials remain in situ.

The exposed skeletons were drawn (Figure 2), photographed, and transported to the laboratory. A shovel test pit was dug to a depth of one meter. This test indicated culturally sterile soil and did not reach a clay base. Soil color changed with depth from reddish to yellowish.

The burial area was in a rectangle 88 cm wide by 130 cm long in a generally north-south direction. The initial impression of the skeletal remains in situ was that of a single individual with a crushed skull, and with fairly good bone articulation except for the leg area. Subsequent laboratory analysis revealed that the remains of two individuals were present in the total bone collection, so that a more complex interpretation is required. It now appears that much of the articulated bone represents a female of advanced age, in a supine position, with a younger male body placed on top. Legs are semi-flexed. The head orientations are to the south.

In the mid-rib area there were five ornamental artifacts. From the female's right to left in a rough alignment were: (1) a round disk bead of an undetermined shell type, (2) two tubular beads of whelk shell columella, (3) a fragmentary pod-like object possibly made of antler, and (4) a triangular pendant made from the whorl of a whelk shell. These specimens are illustrated in Figure 1C-F. The impression was that these ornaments were worn in a loose necklace fashion, if indeed they were strung and worn at the time of burial. No other grave goods were observed at the site.



A - Williams dart point, B - Perdiz arrow point, C - disk marine shell bead,
 D - two tubular marine shell beads, E - halves of pod-like object (antler?),
 F - marine shell pendant

Figure 1. Site 41WH44 artifacts

Skeletal analysis

Skeletal analysis was done by Rebecca Storey. Two individuals are present, as shown by two sacra, two left ulnae, and two sets of teeth.

One individual is a female, as judged by characteristics of the pelvis. Childbirth is indicated by the preauricular sulcus being deepened and having parturition pits. This female was over 50 years of age, based on the condition of the auricular surface. This individual had an active chronic skull infection with some indication of healing. There is also evidence of chronic infection of the several long bones. Tooth wear is fairly advanced, as would be expected for an Indian of this advanced age.

The second individual was in the 20's age range, judged by development of the teeth. Dental wear was moderate. Although the sex of the second individual has not been determined, it may be male based on the robust nature of the long bones. There is little indication of arthritis for either individual. Much of the bone material was in a very fragile condition and very difficult to analyze.

Interpretation of findings

The small surface collection representing the Late Prehistoric period (Perdiz arrow point and pottery), perhaps Early Ceramic period, and the Late Archaic period (Williams dart point) leads to the conclusion that site 41WH44 had a fairly long occupation sequence. This is not unusual for this area. This raises the question regarding in which time period the burials were made. The semi-flexed position of the burials is not diagnostic, but is more common in periods after the Late Archaic. The presence of marine shell grave goods points strongly to the Late Archaic. Such shell ornaments are diagnostic of a Late Archaic culture of the lower Brazos and Colorado River valleys. Burial goods are not common in later time periods, after the introduction of ceramics.

Time periods considered here include the Late Archaic (1500 B.C. to A.D. 100), the Early Ceramic (A.D. 100 to 600), and the Late Prehistoric (A.D. 600 to 1500) as summarized by Patterson (1979). A broad-based hunting and gathering lifeway was practiced during all of these time periods. The chief demarcations between these periods are the introduction of ceramics at the start of the Early Ceramic period, and arrow points supplanting dart points as the dominant projectile point type at the start of the Late Prehistoric period.

The dart point from site 41WH44 is classified as the Williams type, based on its size and corner notching. The corners of the base appear to have been broken off. This dart point type was common in Central and Southeast Texas during the Middle and Late Archaic periods (Turner and Hester 1985:158). The Williams point has been found at Late Archaic sites where marine shell ornaments also occur (Vernon 1989: Figure 6). The Perdiz arrow point found here is crudely made with unifacial flaking. This arrow point type is common in much of Texas in the Late Prehistoric period.

Marine shell ornaments, and their presence as grave goods, is a strong trait of a Late Archaic burial tradition in Wharton, Fort Bend, and Austin Counties in the Brazos and Colorado River valleys. Eight sites of this tradition have been summarized by Story (1990: Figure 36). The best documented examples are sites 41AU36 and 41AU37 close to the Brazos River near Wallis (Hall 1981). Three additional sites of this tradition are now known, including site 41WH44 in this article, and sites 41FB3 (Patterson 1991) and 41FB42 in Fort Bend County, with reports on these two latter sites to be published by the Houston Archeological Society.

The Late Archaic cultural complex represented by mortuary sites in the western part of Southeast Texas is not found in other parts of the region. During the Late Archaic time period, there appears to have been a higher degree of social organization in the western part of Southeast Texas,

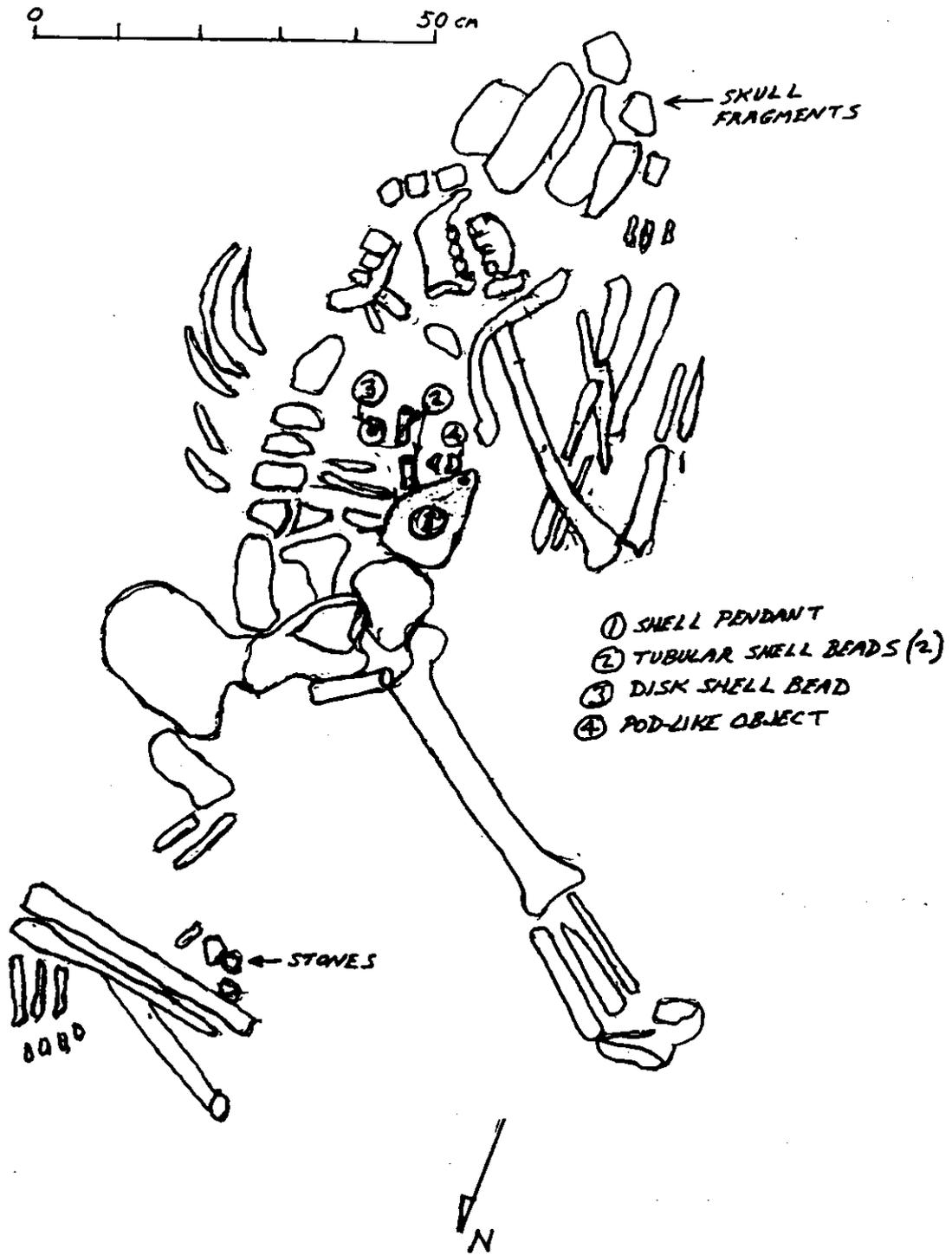


Figure 2. Skeletal remains in situ

in the lower Brazos and Colorado River drainage systems, than in the central and eastern parts of Southeast Texas. Hall (1981) has given a detailed discussion of this Late Archaic cultural complex in the western subregion. Food resources, such as pecans, may have been richer in this subregion. A relatively more prosperous lifeway made possible by good food resources may have led to a higher degree of social organization. This Late Archaic burial tradition is characterized by exotic grave goods from other geographic areas. This includes marine shell ornaments from coastal areas, large chipped stone artifacts from Central Texas (Hall 1981), and ground stone artifacts that appear to be from the Poverty Point exchange system of Louisiana (Patterson 1989).

The tubular and disk beads from site 41WH44 correspond closely to Hall's (1981: Figure 48) Forms 1 and 6, respectively, at site 41AU36. The triangular pendant with a hole at the apex made from a whorl of a whelk shell from site 41WH44 is similar to Form 7 at 41AU36 (Hall 1981: Figure 47); however, the serrated edges are not present on specimens from 41AU36. The exterior surface appears to have been coated with a resin-like substance. The wandering lines of punctation on the inside appear to be man-made; the hatchures on the outside lower corners are definitely so.

Summary

The burials at site 41WH44 appear to be best placed in the Late Archaic period, in the range of 600 B.C. to A.D. 100, as related to a burial tradition that occurred in the western part of Southeast Texas during this time period. Marine shell artifacts from this site are good examples of this relationship. This Late Archaic cultural complex is becoming better defined as additional data continues to become available.

Mr. and Mrs. Krenek are thanked for the opportunity to examine the burial and the site. While the heavy grading work has disturbed the surface, the presence of the burial shows that some stratigraphy remains undisturbed, so that additional archeological materials may remain.

The artifacts have been returned to the Krenek family for custody. The skeletal material will be returned for reinterment as they believe appropriate.

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Site 41CH290, A Multi-Component Shell Midden, Chambers Co., Texas

L. W. Patterson and C. R. Ebersole

Introduction

This article is a summary of a survey made for prehistoric site 41CH290 in Chambers County, Texas. This site was occupied during the Early Ceramic period (A.D. 100-600) and the Late Prehistoric period (A.D. 600-1500), and perhaps into the time period of European contact after A.D. 1500.

A surface collection was made at this location, with artifacts found that are typical of those usually found in these time periods at shell midden sites in the Galveston Bay area (Aten 1983). The occupations were by nomadic hunter-gatherers who were somewhat more sedentary than their inland counterparts, with one indication being the presence of large amounts of pottery that would have been difficult to transport.

This site was discovered in July 1991 by Sheldon Kindall, Mike Marshall, and Richey Ebersole in their Galveston Bay Archeological Survey, a Texas Archeological Society project still in progress. Over 110 previously unreported prehistoric sites have been found by this survey work.

Site description

Site 41CH290 is a dense *Rangia* shell midden located on the shore of Cotton Lake in Chambers County. The site is about 200 feet long at the shore edge, and has been highly disturbed by wave action. This is a brackish water lake, with tidal flow from Trinity Bay through connecting bayous. The site is near a large wooded area that would have been a good hunting location. Site 41CH290 is at the mouth of a bayou that formerly connected the lake with Trinity Bay. This bayou no longer exists due to modern land use changes. This bayou ran from the lake into Trinity Bay, and may have been a channel of the Trinity River at one time. The Trinity River has thrashed and looped at its mouth and over the millenniums has carved out a wide marshy bottom land, trapezoidal in shape. This bottom land runs roughly from the old community of Barrow on Trinity Bay, two miles to the southwest of the site, to Anahuac, about six miles to the east. This marshy delta is bounded on the east and west by 30 to 40 foot bluffs, the natural level of the land. Water in this area is usually brackish, but subject to salinic variation at times of high water. The bluffs to the west are wooded and would have been good hunting areas.

Site chronology

Site 41CH290 was occupied during the Early Ceramic and Late Prehistoric time periods. It is possible that occupation also occurred later, after A.D. 1500, but this cannot be determined by available data. Evidence of occupation at this site during the Early Ceramic period (A.D. 100-600) is from ceramic and lithic artifacts. A few Tchefuncte and Conway potsherds were found at site 41CH290; these are placed in the Early Ceramic period in Aten's (1983:Figure 14.1) ceramic sequence for the Galveston Bay area. Aten (1983:306) has noted that dart points occur at coastal margin sites in Southeast Texas during the Early Ceramic period but not later in the Late Prehistoric period, after the bow and arrow became the predominant weapon system. Four dart points and a dart point stem or preform fragment are additional evidence at this site for occupation during the Early Ceramic period.

There are several indications in the ceramic collection from this site for occupation during the Late Prehistoric period (A.D. 600-1400). Patterns on Goose Creek Incised pottery found here correspond to patterns shown by Aten (1983:Figure 12.2) for this pottery type in the Late Prehistoric period in the Galveston Bay area. San Jacinto grog-tempered sherds and bone-tempered sherds found here represent the Late Prehistoric period (Aten 1983:Figure 14.1). An arrow point found at this site also represents the Late Prehistoric period.

The ceramic collection

A summary is given in Table 1 of sherds collected from the surface of site 41CH290. The relative proportions of various pottery types are about what would be expected compared to Aten's (1983:Figure 14.1) ceramic sequence for the Galveston Bay area. In other words, from the standpoint of ceramics, site 41CH290 is a typical shell midden site for this general area. As would be expected, Goose Creek sandy paste sherds are the most numerous type. Goose Creek pottery was made during both the Early Ceramic and Late Prehistoric time periods. San Jacinto grog-tempered pottery is fairly well represented in this sample, from the Late Prehistoric period. Tchefuncte contorted paste and Conway coarse sand tempered are minor pottery types of the Early Ceramic period, and bone-tempered pottery is a minor type of the Late Prehistoric period.

Only 10 specimens were rim sherds. Rolling during wave action probably removed many rim edges. Three Goose Creek sherds had drilled lace holes for repair, possibly indicating use of some pottery for storage rather than for cooking. Typical incised patterns on sherds collected at this site are shown in Figure 1. The most common pattern here is a series of incised lines parallel to the vessel rim.

The lithic collection

Five projectile points were found at site 41CH290, with attributes summarized in Table 2, and illustrated in Figures 1 and 2. The Gary, Kent, and Kent-like dart point specimens represent the Early Ceramic period, and a crude Perdiz-like contracting stem arrow point represents the Late Prehistoric period. A dart point stem or preform fragment, made of petrified wood, was also found. The largest Kent point (Figure 11) was made of heat-treated chert. Most of the projectile points were made of petrified wood, which would have been the nearest lithic raw material available, in the Trinity River drainage system. In the Early Ceramic period, dart points tended to be small in both the inland and coastal margin portions of Southeast Texas.

The only other formal lithic tool type recovered was a bifacial microtool (Figure 2B), possibly used as a perforator to drill lace holes in pottery. Some chert and petrified wood flakes were found mainly in one small concentrated area. Some specimens show evidence of heat treating, and only one specimen has any remaining cortex. None of the flakes have edge wear patterns that would indicate use as tools. Flake size distribution is given in Table 3 and Figure 3. The semilog plot of flake size distribution in Figure 3 is not a straight line that would indicate the bifacial reduction process (Patterson 1990a). The concentration of lithic flakes in one small area may represent a cache of miscellaneous flakes being held for future use. Lithic materials are generally not found in large quantities at coastal margin shell midden sites.

Faunal materials

Coastal shell middens generally have good preservation of faunal remains. A total of 102 pieces of bone were recovered from this site, with a total weight of 461 grams. Most specimens appear to

be deer bone. Four deer teeth were found. W. L. McClure has also identified large fish and large turtle remains in this collection.

Several bone tools were found, with some specimens shown in Figure 2. Specimens include two bone projectile points and eight bone awls. Since the coastal margin is a lithic-poor area, bone tools were used extensively in place of stone tools. The specific uses of bone tools are not well understood, however.

Summary

Site 41CH290 has the typical traits of *Rangia* shell midden sites in the Galveston Bay area. Artifacts collected here represent occupations in the Early Ceramic and Late Prehistoric time periods. Previous research (Aten 1983; Dillehay 1975) concludes that shell midden sites were occupied for extended periods during warm weather months, as indicated by seasonality studies of *Rangia cuneata* shell. This conclusion can be questioned, especially in regard to the possibility that sites were utilized also for some periods during cool weather months. Aten's (1981) correlation for the seasonality of *Rangia cuneata* shellfish does not have the capability of determining when a site has been used in more than one season during the year. There is an ethnographic account that conflicts with the concept that coastal shell middens were occupied only in warm months. Cabeza de Vaca relates that he was with Indians at a mainland coastal location, thought to be near Galveston Island, where shellfish were eaten from December through March (Hedrick and Riley 1974:26). Also, Aten's (1981) correlation of *Rangia* seasonality may not be generally accurate. A live *Rangia* sample taken from Trinity Bay in February 1992 has given a time determination of July by use of Aten's correlation (Patterson et al. 1991). Research continues on defining the seasonal round for Indians of the coastal margin in Southeast Texas (Patterson 1990b).

This article is an example of surface collecting as the next logical step after site location. Intensive surface collecting can often determine the nature of a site by the finding of artifacts that are time-diagnostic and of artifacts that indicate site activities.

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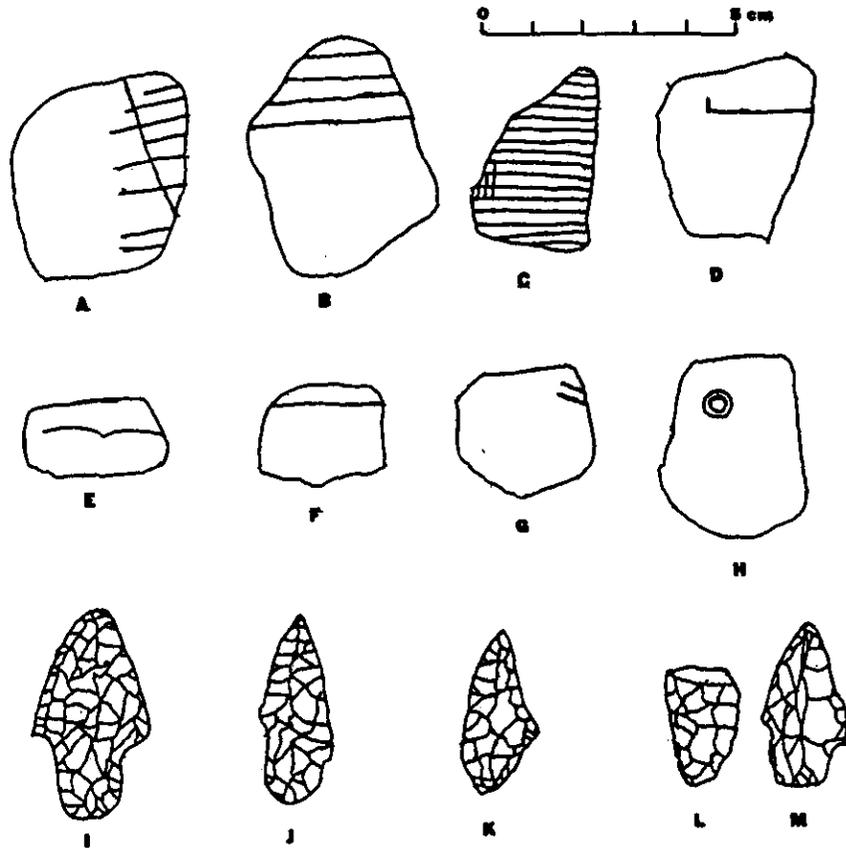
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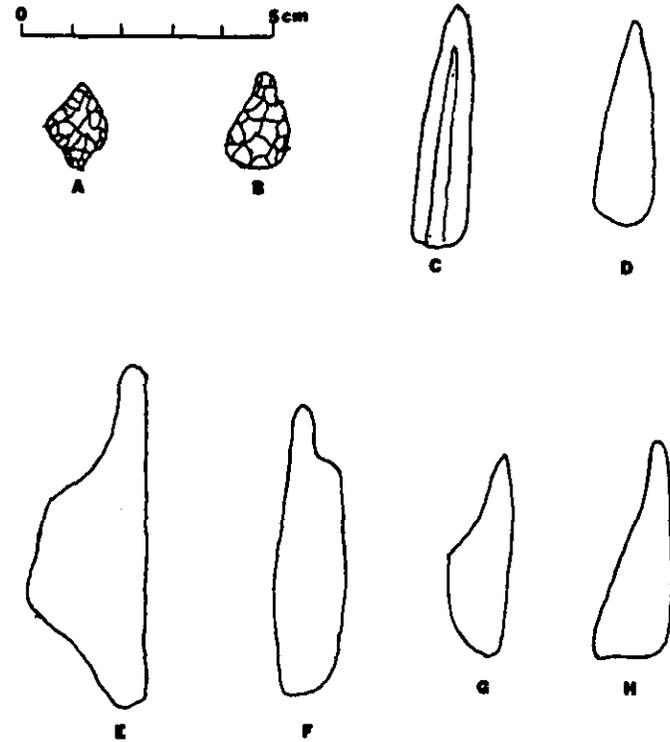
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A to G - incised sherds, H - sherd with lace hole, I - Kent point, J - Kent-like point, K - Gary point, L - dart point stem or preform fragment, M - Kent point

Figure 1. Ceramic and lithic artifacts



A - Perdiz-like point; B - bifacial microtool; C, D - bone projectile points; E to H - bone awls

Figure 2. Lithic and bone artifacts

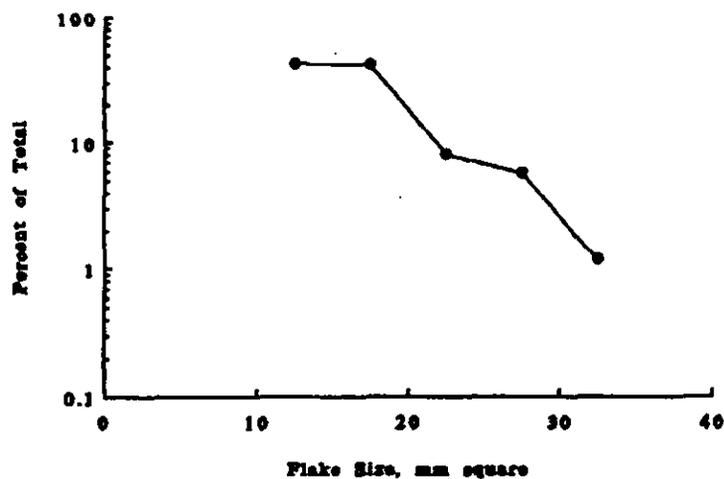


Figure 3. Lithic flake size distribution

Table 1. Site 41CH290 Ceramics

| | no. | % |
|---------------------|-----|-------|
| Goose Creek Incised | 11 | 2.8 |
| Goose Creek Plain | 277 | 70.9 |
| San Jacinto Plain | 81 | 20.8 |
| San Jacinto Incised | 2 | 0.5 |
| bone tempered | 8 | 2.0 |
| Tchefuncte | 6 | 1.5 |
| Conway | 6 | 1.5 |
| total | 391 | 100.0 |

Table 2. Site 41CH290 Lithic Projectile Points

| type | dimensions (mm) | | | wt. (gm) | material |
|-------------|-----------------|------|-----|----------|----------------|
| | L | W | T | | |
| Gary | 31.5 | 16.4 | 9.9 | 3.5 | petrified wood |
| Kent | 41.3 | 23.2 | 7.2 | 6.4 | chert |
| Kent-like | 36.8 | 14.6 | 9.3 | 4.5 | petrified wood |
| Perdiz-like | 16.5 | 12.5 | 4.5 | 1.0 | petrified wood |
| Kent | 32.2 | 17.0 | 6.0 | 2.6 | petrified wood |

Table 3. Flake Size Distribution

| size (mm) | no. | % |
|-----------|-----|-------|
| under 15 | 37 | 43.0 |
| 15-20 | 36 | 41.9 |
| 20-25 | 7 | 8.1 |
| 25-30 | 5 | 5.8 |
| 30-35 | 1 | 1.2 |
| total | 86 | 100.0 |

