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INTRODUCTION

This report gives the results of excavations by the Houston Archeological Society at site 41FB223 in Fort Bend County, Texas. This site was discovered by Joe Hudgins and Grant Hall, and recorded for state records by Hall. Excavation work at 41FB223 was done during the spring and fall of 1993. Work at this site was made possible through the courtesy of the landowners, Joe Davis and family.

Field work was supervised by the HAS Field Director, Joe Hudgins. Sheldon Kindall was in charge of field notes. Richard Gregg supervised site survey work. Laboratory processing of artifacts from the fall season was supervised by Melissa May. Artifacts from the spring season were processed by Lee Patterson. Analysis of faunal remains was done by William McClure.

Individuals who participated in the excavations included Karen Acker, Bill Csayni, Charles Boyle, Richey Ebersole, Dick Gregg, Joe Hudgins, Bill Just, Sheldon Kindall, Mike Marshall, Ray McCausland, Don McReynolds, Bev Mendenhall, Bernard Naman, Tommy Nuckols, Tom Palmer, Lee Patterson, Gary Ryman, Steve Sebesta, Jeanette Siciliano, Robert Shelby, Randy Spalinger, Ray Trebbi, Muriel Walker, Jim Wells, Roy Whitney, and Gina Williamson.

Site 41FB223 is a large stratified prehistoric campsite with significant occupation components from the Late Paleo-Indian through the Late Archaic time periods. No ceramics were found here to indicate any use of this site in the Early Ceramic or Late Prehistoric periods. A trace of use of this site in the Late Prehistoric period was indicated by the recovery of a Perdiz arrow point on the surface. Modern materials were found in the top strata from farm trash dumping, but modern disturbance did not affect most of the strata that contained prehistoric materials. The Late Paleo-Indian and Early Archaic periods are particularly well represented at this site. As with other prehistoric sites in Southeast Texas, occupation at site 41FB223 was probably on a seasonal basis by nomadic Indians with a hunting and gathering lifeway. Since this is a startified site, data from excavations at this location contribute to a better understanding of regional cultural chronology.

GEOGRAPHIC AND ENVIRONMENTAL SETTING

Site 41FB223 is located south of Fulshear, Texas on the eastern edge of the Brazos River floodplain. The site is on a high terrace, and river flooding would generally not have affected this site during periods of human occupation. The location is about one mile from the present channel of the Brazos River. There are presently no trees on this site, but trees may have been present in prehistoric time, before the area was cleared for modern farming.

This area is a mixture of deciduous woodlands and coastal prairie. The general area is well known for nut trees, especially pecan. Prehistoric sites in this area, such as 41AU36 (Hall 1981), 41FB3 (Patterson et al. 1993a), and 41FB95 (McClure 1987), have a large variety of faunal remains. Natural food resources in this part of Southeast Texas were abundant. Due to poor preservation of floral remains, the complete prehistoric diet cannot be reconstructed. Faunal remains from sites in this area indicate use of small animals, such as squirrel, rabbit, and turtle, and large animals, such as deer and occasionally bison. Deer and turtle are generally the most common faunal remains at sites of inland Southeast Texas (Patterson 1990b:Table 10).

At the present time, the closest water source to this site is a tributary stream of the Brazos River that crosses the floodplain about one-half mile from this site. The land contour indicates, however, that there may have been a stream adjacent to 41FB223 in prehistoric time. If this stream channel became inactive at the end of the Late Archaic, this may account for the lack of significant occupation of this site after the Late Archaic period, after about A.D. 100. Prehistoric sites in Southeast Texas are generally near water sources. The climate may have become drier at the end of the Late Archaic period (Story 1990:244).

SITE GEOLOGY

Site 41FB223 is located on a high sandy terrace of the Brazos River. The base of this terrace is clay which probably represents the Beaumont Formation. The clay base is capped with about 8 feet of silty sand, forming a prominent feature called Huntington Mound on the USGS quad map of the area. At the sand-clay interface the clay has a well-scoured appearance, which may represent a severe erosional event from river flooding during the Pleistocene period. It is typical of sites in Southeast Texas to have geological deposits missing from the end of the Beaumont Formation at about 30,000 years B.P. to the start of the Paleo-Indian period at about 12,000 years B.P.

This site is on the south side of a large sand mound, about 2000 feet long and about 1200 feet wide. The sandy fill at the top of site 41FB223 seems to be too high to have been caused by alluvial deposition from river flooding. A colluvial model seems to be more appropriate, where a high portion on the north side of the mound was gradually redeposited on the site 41FB223 location on the south side of the mound. A similar colluvial model has been given by Thoms (1993:Chapter 6) for a site on a high sandy area in Brazos County.

This sand mound is now bisected from east to west by an erosional low area. Erosional bisecting of the mound may represent the end of sand deposition on site 41FB223, after the Late Archaic period. The erosional low area may have been caused by modern farming operations. Late Paleo-Indian artifacts were found at this site down to the clay-sand interface, with all cultural materials being from the Holocene period after 10,000 years ago.

The original formation of the large sand mound at this location possibly occurred during the Late Pleistocene period, caused by alluvial deposit during a period of high rainfall, perhaps followed by ridge formation as vegetation trapped wind-blown material. This would seem to be consistent with the well-scoured appearance of the clay at the base of the deep sand deposit. Another possiblity suggested by Bob Pickens, a geologist, is that the sand mound here originally formed during an interglacial period during river valley accretion related to a rise in sea level.

Various strata of this site have brown silty sand down to the Late Paleo/Indian-Early Archaic interface at about 7000 B.P. (5000 B.C.). Below this depth, there is a sudden change to light tan sand which continues down to the sand-clay interface. No artifacts were found below this interface. Michael Waters of Texas A&M University has suggested that the light tan sand may be the result of horizontal groundwater leaching above the clay barrier. Stratified sites 41WH19 (Patterson et al. 1987) and 41FB42 (Patterson et al. 1993b) also have light colored sand below the Late Paleo-Indian/Early Archaic interface. Perhaps there was a wet climate during the Late Paleo-Indian period of 10,000 to 7000 years B.P. Measurements by McClure show that sand grain size is the same for all occupation levels of this site.

Excavations and core samples show that the clay-sand interface is level, while the site surface is irregular due to erosion. Site stratification has been reconstructed based on equivalent levels from the sand color change, as shown in Table 1. Use of equivalent levels gives a good projectile point type sequence, compared to stratified sites 41WH19 (Patterson et al. 1987) and 41FB42 (Patterson et al. 1993b).

No significant prehistoric artifacts were found above equivalent excavation level A6. Levels A1 to A5 were probably formed after termination of prehistoric occupation of this site. The deepest disturbance from modern materials varied from levels A6 to A13 for various pits. However, only the Morhiss point from Pit A and the Pedernales point stem from Pit V appear to be in levels of modern disturbance. Most of the projectile point sequence appears to be in undisturbed context. Apparently, only some Late Archaic levels were affected by modern disturbance in some pits.

SOIL SAMPLES

Samples of soils from each 5 cm level of Pit H were bagged separately and processed for data relative to the soils as well as faunal materials. The samples were dried and the colors recorded according to the Munsell numbers (Geological Society of America). In the upper (darker) levels there were small aggregations of yellow soils and in the lower (yellow) levels, there were larger aggregations of darker soils. This is an indication of vertical movement of soils due to the activity of worms and other organisms. From surface to -160 cm color is 10YR4/2 (dark yellowish brown) with slightly lighter colors at the -20 and the -110 cm levels. From -190 to -240 cm color is 10YR7/4 (grayish orange). From -160 to -190 cm there is a fairly smooth transition between the above colors.

Later, the samples were each weighed and washed through screens. Less than 1% of each sample was retained on the #40 screen which has an opening of 0.42 mm. This retained sample was later examined with a microscope. The soil passing through the #40 screen was allowed to stand in water for 24 hours. At that time there was a slight color remaining in the water. The color in samples from the lower levels was slightly yellow and from the upper levels it was brownish with yellow cast. None of the soil in any level had the characteristic of cohesion that is in clay, although the silts act as binders when dry. Thus the soil can be classified as fine sand to silt. The yellow color is due to the finer silts and the darker color is due to organic matter. These samples contained organic and inorganic matter that is tabulated in Appendix 1.

The sand grains are mostly clear quartz but there are many grains that have a wide variety of colors. The grains have rounded edges as would be due to long-distance tumbling in water. The sand and silt composition is consistent throughout the depth of the excavation.

EXCAVATION DETAILS

A site contour map is shown in Figure 1A. Layouts of excavation pits in Groups 1 and 2 are shown in Figures 1B and 1C, respectively, for the west and east ends of the site. Figures 1B and 1C do not show Pit V, which was located in the middle of the site. A total of 22 one-meter square pits were dug. Due to lack of natural stratigraphic indications, excavations were done in arbitrary 10 cm increments. All dirt was put through 1/4-inch mesh screens. In addition, soil samples were collected from Pit H, the deepest pit, for fine-screen work by McClure.

This is a large site. Excavations and test cores show that the site is a least 79 feet (24 meters) wide in a north-south direction, and at least 387 feet (118 meters) long in an east-west direction along the southern edge of the sand mound. At the eastern end of site 41FB223, there is a horizontal farm silo that has been deeply placed into the south side of the sand mound. All of the diagnostic lithic artifacts collected from the surface of this site are from the disturbed area around the silo. Shovel tests indicate that artifact density drops off east of the silo.

About 800 feet (244 meters) east of site 41FB223, some lithic artifacts were found on the surface during the original site survey by Hall and Hudgins. This location was recorded as site 41FB222. Later surface collecting and shovel tests at 41FB222 recovered chert flakes and clayballs, but no time-diagnostic projectile points. As at 41FB223, there were no ceramics found at 41FB222, so that artifacts are probably not later than the Late Archaic period. Surface collecting at site 41FB222 yielded 31 chert flakes. Shovel test A at site 41FB222 yielded 14 chert flakes and 10 clayballs at depths of 0 to 40 cm, and 8 chert flakes and 6 clayballs at depths of 40 to 70 cm. Shovel test B at this site yielded 31 chert flakes and no clayballs at depths of 0 to 40 cm, and 11 chert flakes and 1 clayball at depths from 40 to 70 cm. It is concluded that cultural deposits at site 41FB222 are at a lower density and are shallower than at site 41FB223. The time periods of occupation of site 41FB222 remain to be determined.

There is evidence of gopher activity at this site, which would have caused some soil disturbance. As discussed later, regarding chert flake sizes at various excavation levels, gopher activity does not seem to have moved large pieces of material, such as projectile points. There is only one excavated projectile point that is not in expected chronological sequence, compared to other excavated sites in this area. In Pit Q, a Pedernales point was found in Early Archaic excavation level A18. However, this specimen was clearly in displaced context in a small area of the southwest corner of Pit Q, where soil difference was apparent. It appears that there was a small erosional trench on the outer south side of Pit Q on the sand mound edge. The Pedernales point was apparently displaced downward from a higher level and the erosional trench was then in-filled so as not to be apparent on the surface.

Except for Pit H, all excavation pits were located on the sloping south bank of the sand mound. This was done to obtain less excavation depth, so that each pit could be completed in less time. There was a time restraint on each excavation pit here. Because of horses and cattle in the field, each excavation pit had to be backfilled at the end of each day's work. Pit H on the level part of the sand mound was 2.3 meters deep. Both excavation safety and time restraint dictated against most test pits being located to the north on the level part of the mound surface. Judged by the results of Pit H, little data was lost by use of this excavation strategy. Pit H did not have many clayballs above equivalent level A12, and only a few small chert flakes above equivalent level A9.

MODERN MATERIALS

There is evidence of modern disturbance of site 41FB223 in the form of modern materials in the top excavation levels. A summary of modern materials is given in Table 2. An estimate of the depth of modern disturbance in various excavation pits is shown in Table 1. Some very small pieces of modern materials were found below these depths, but were not counted because they appear to be due to gopher activity.

There is no evidence of significant modern disturbance in any excavation pit below level A13. It is judged that modern disturbance of this site only affected some excavation levels

in the Late Archaic period. Excavated materials from the Late Paleo-Indian, Early Archaic, Middle Archaic, and much of the Late Archaic are from undisturbed context, except for gopher disturbance of small-size materials. Gopher disturbance mainly affected small-size chert flakes, below 15 mm in size.

There is no evidence of recent dumping on site 41FB223. No modern materials were observed on the surface, and all excavated modern materials are of types that may be over 50 years in age. At one time, there may have been a building near this site, according to the present landowner, but no evidence of this can be seen. All present buildings are several hundred feet from the site.

PROJECTILE POINTS AND CHRONOLOGY

Data for projectile points found at site 41FB223 is given in Table 3, and a summary of projectile points by excavation level is given in Table 4. The sequence of projectile point types is consistent with projectile point sequences at other sites in the western part of Southeast Texas, such as 41WH19 (Patterson et al. 1987) and 41FB42 (Patterson et al. 1993b).

All of the equivalent B levels are judged to be in the Late Paleo-Indian period (10,000-7,000 B.P.). Cultural materials were found in equivalent levels B1 to B6, but projectile points were found only in levels B1 and B3. Three Angostura points (Figure 2A,B,C) were found in level B1. These specimens appear to be from the later portion of the Late Paleo-Indian period, since they are near the lowest Early Archaic level A18. An Angostura point at site 41FB42 (Patterson et al. 1993b:Figure 6A) was also from the later part of the Late Paleo-Indian period, perhaps between 8000 and 7000 years B.P. Prewitt (1981:77) places the Angostura point in a time range of 8500 to 7000 B.P. in Central Texas. Two Early Notched point stem fragments were found in levels B1 and B3 (Figure 3F,G). These stem fragments are not complete enough to indicate whether the specimens were side notched or corner notched. Two Early Stemmed points were found in level B1 (Figure 3A,B). The Early Stemmed specimen shown in 3B may have a reworked blade, because the blade area is small.

Level A18 is the earliest Early Archaic period (7000-5000 B.P.) level, and at this excavation depth Early Stemmed points become predominant, in the same manner that Early Stemmed points become predominant at site 41WH19 (Patterson et al. 1987:Figure 7) during the Early Archaic. Fagan (1991:310) has noted a progression from notched to stemmed point types throughout the Southeast Woodlands. Early Stemmed points started in the Late Paleo-Indian period as a minor type, and became predominant in the Early Archaic period. All point specimens from Late Paleo-Indian and Early Archaic periods at site 41FB223 have ground stem edges. As at site 41WH19 (Patterson et al. 1987), the practice of grinding stem edges at site 41FB223 apparently stopped in the Middle Archaic period.

No Angostura points and only one Early Notched point (Figure 3E) was found above excavation level B1. Six Early Stemmed points were found in level A18, and one in level A16. As at site 41WH19 (Patterson et al. 1987:Figure 7), Early Stemmed points at site 41FB223 do not have uniform morphologies. Two other stemmed point specimens from the Early Archaic levels can be compared to standardized types. One specimen (Figure 2D) has a Carrollton-like shape, and another specimen (Figure 3C) is a contracting stem that is probably from a Wells point. At site 41FB37 (Patterson 1988), a Carrollton point is placed in the Early Archaic period with a radiocarbon date of 6490 +/-120 years B.P. (I-15,333), and a Wells point was found at a slightly higher stratigraphic position. Because

Early Stemmed points of the Late Paleo-Indian and Early Archaic periods are not standardized, this point type is probably overlooked in many collections as representing these early time periods. In summary, a total of 9 stemmed point specimens were found in excavation levels A18 to A16 that would place this excavation interval in the Early Archaic period.

At site 41FB223, equivalent levels above A16 appear to represent the Middle Archaic (5000-3500 B.P.) and Late Archaic (3500-1900 B.P.) periods. There are not enough data to determine the stratigraphic breakpoint between the Middle and Late Archaic periods, but projectile point types indicate that both time periods are represented. The Bulverde point type is from the Middle Archaic period in Central Texas (Turner and Hester 1993:82) and also in Southeast Texas (Patterson et al. 1993b). A possible Bulverde point stem found in a shovel test was between levels A10 and A15. A complete Bulverde point was found by a farm worker in a pit dug by children at this site.

As noted above, a Pedernales point was found in Pit Q at level A18, but this point probably was displaced from a higher level. In Southeast Texas, the Pedernales point occurs in both the Middle and Late Archaic periods (Patterson 1991b). A Pedernales point stem was found in Pit V at Level A7, and this specimen is probably from the Late Archaic.

At this site, Gary and Kent points represent the Middle and/or Late Archaic time periods. One Kent point made of petrified wood was found at level A11 (Figure 4D), and another Kent point (Figure 4C) was found on the site surface. A Gary point (Figure 4C) was found in level A13. A Morhiss point which represents the Late Archaic period (Turner and Hester 1993:158) was found in unscreened dirt taken from levels A7 to A10 in Pit A. Two fragments of stemmed points (Figure 5A,B) from levels A13 and A14 might be from Gary points.

Two unifacial arrow points (marginally retouched flakes) were found at levels A14 and A15 (Figure 4G,H). This is a further demonstration of early use of the bow and arrow in Southeast Texas, before the use of standardized bifacial arrow point types in the Late Prehistoric period (Patterson 1982,1992). It should be emphasized that use of a 10-power magnifier is generally necessary to identify unifacial arrow points, to distinguish purposeful edge retouch from fortuitously pointed flakes. It is easy to overlook unifacial arrow points in lithic flake collections. Unifacial arrow points in Southeast Texas made as marginally retouched flakes are similar to arrow points used throughout Eurasia in the Mesolithic period, such as illustrated by Clark (1977:112).

A Late Prehistoric Perdiz bifacial arrow point (Figure 4I) was found on the surface of site 41FB223. It is the only indication of any site use after the Late Archaic until modern times. This is similar to sites 41FB95 and 41FB198 at nearby Pool Hill (Patterson and Hudgins 1987,1991), where a few arrow points are the only indication of any site use after the Late Archaic period. The Perdiz point started in Southeast Texas at about A.D. 600 (Patterson 1991a), and somewhat later in Central Texas (Turner and Hester 1993:227).

The total number of projectile points found at this site is not large relative to the amount of excavation work done. Perhaps the density of projectile points should not be expected to be high because of the large site area. Most prehistoric sites in Southeast Texas have a much smaller area than site 41FB223.

The types of projectile points found at site 41FB223 are typical of sites in the western part of Southeast Texas. There is a mixture of types from traditions of the Southern Plains (Central Texas) and the Southeast Woodlands (Patterson 1983). In the Paleo-Indian

period, Angostura represents the Southern Plains tradition at this site, and Early Notched represents the Southeast Woodlands tradition. In the Archaic period, Early Stemmed, Gary, Kent, Carrollton, and Wells are generally related to point styles of the Southeast Woodlands, while Bulverde and Pedernales are related to Central Texas traditions. It should be noted that complete time ranges for each dart point type are not well-defined in Southeast Texas, but point types can be placed in broad time periods as used in this report (Patterson 1991b).

GENERAL LITHICS

At site 41WH19 (Patterson et al. 1987), formal types of heavy stone tools were found in the Paleo-Indian period, but not later. Four heavy stone tools of Paleo-Indian types were found at site 41FB223. A thick bifacial scraping tool (Figure 6D), made from a chert cobble, was found in Pit N at level B2. Edge wear on the working end is of the unifacial type that is characteristic of the scraping function (Tringham et al. 1974). A large thick scraper (Figure 6A) and a combination scraper-graver (Figure 6C) were found on the site surface near the silo. A large bifacial knife was found in Pit S at level A18, at the interface of the Paleo-Indian and Early Archaic levels. Other stone tools found in the Late Paleo-Indian period include a small, thick scraper (Figure 6E) from Pit U at level B1, and a notched tool on a biface fragment (Figure 7D) also from Pit U at level B1.

The utilized flake was the dominant stone tool type in Southeast Texas, especially after the Late Paleo-Indian period. Utilized flakes were often casually selected from biface thinning debitage, which was usually available at campsites from the manufacture of dart points. As would be expected, only a few formal unifacial tools were found at site 41FB223 from the Archaic period. As shown in Table 5, these formal types of unifacial stone tools include 1 perforator, 2 notched tools, 1 nosed tool, 4 gravers, and 3 scrapers. A few utilized flakes had a unifacial edge wear pattern of the scraping use type, including one each from Pit O (A13), Pit R (A16), and Pit S (A16).

There is much evidence of lithic manufacturing at this site, including chert flakes (Tables 10,11), dart point preforms (Table 5), quartzite hammerstones (Table 6), a few chert cores (Table 7), and a few thick chert pieces (Table 9). As shown in Table 5, 26 dart point preforms and preform fragments were found, and are a primary indication of dart point manufacturing activity at this site.

The main lithic raw material used here was chert, which is found as cobbles in alluvial deposits of the Colorado and Brazos River basins. Most primary reduction of chert cobbles to produce flake blanks for dart point manufacture was probably done at a lithic source. Dart points were then made at the campsite. Primary reduction of chert cobbles at the source allows materials to be tested, and reduces transportation volume and weight. As shown in Table 7, 27 chert cores were found at this site, but this is a small number compared to the 8451 lithic flakes recovered. A large proportion of the flakes found at this site are probably from the reduction of flake blanks rather than from the reduction of chunky cores.

It is likely that flake blanks used to manufacture large dart points came from Colorado River sources, and flake blanks for smaller dart points came from nearer Brazos River sources. Chert cobbles up to 150 mm in length are easy to obtain at Colorado River sources, but chert cobbles at Lower Brazos River sources are seldom over 60 mm in length. Weber (1991) has demonstrated experimentally that it is also practical to produce dart points by the reduction of fairly flat (thin) chert cobbles. This strategy would have been best for use of local Brazos River chert cobbles, where transport distance was not a problem. Projectile points shown in Figures 2A,D,E,G and 4C would seem to be too long

to have been made from cherts of the Brazos River. It should be noted that manufacture of a bifacial dart point is a reduction process, and that flake blanks must be somewhat longer than the finished dart point.

As shown in Table 8, there were 16 chert cobbles found, with 15 having diameters of 50 mm or less. It seems likely that these cobbles were brought from nearby Brazos River sources, to be used for miscellaneous lithic manufacturing rather than for the production of dart points. Most of the cobbles are subspherical in shape, and would be difficult to use for the production of flake blanks of sufficient size for dart point manufacture. This is consistent with the forms of chert cores found here that were made on chert cobbles (Table 7). None of the cores had flake scars that were long enough to indicate manufacture of flake blanks for dart point production. The small number of thick chert pieces (Table 9) is another indication that not much primary reduction of chert cobbles was done at this site.

All dart points from site 41FB223 are made of chert, except for a Kent point (Figure 4D) made of petrified wood. A Brazos River source is likely for the petrified wood.

Another indication that not much primary reduction of chert cobbles was being done at this site is the low percentage of flakes with remaining cortex. For flakes over 15 mm square in size, there were 4.6% primary flakes (covered with cortex), 18.8% secondary flakes (partially covered with cortex), and 76.6% interior flakes (no remaining cortex). Thus, there were 23.4% of flakes with any remaining cortex. This percentage of flakes with remaining cortex is much lower than the 53.6% of flakes with remaining cortex obtained experimentally for primary reduction of chert cobbles (Patterson 1981:32), and is even lower than the 40% of flakes with remaining cortex obtained experimentally for experimental reduction of flake blanks made from chert cobbles.

As shown in Table 6, a total of 61 quartzite hammerstones were found at various excavation levels, with diameters of 30 to 70 mm. It is likely that antler billets were also used for percussion flaking, especially for bifacial thinning, but only one small antler tine has been preserved at this site.

Heat treatment of chert was used extensively for materials at site 41FB223, judged by waxy luster, reddish coloration, and small potlid surface scars found on many flakes. Heat treatment of chert lowers the tensile strength and makes chert easier to flake, and permits longer flakes to be removed for bifacial thinning (Purdy and Brooks 1971;Patterson 1981b).

Lithic flake counts by pit are shown in Table 10, and lithic flake counts by excavation level are given in Table 11. Flakes above level A7 are all small size and are likely to be there due to gopher activity.

Flake size distributions for levels A8 to B2 are shown in Table 12, for the levels where significant numbers of flakes occurred. The main section of a flake size distribution curve tends to be a straight line for bifacial reduction, when percent of flakes is plotted with a logarithmic axis versus flake size with a linear axis (Patterson 1990a). As shown in Table 13, only equivalent levels A8 and A14 had linear curve shapes with this type of plot, while the other levels had roughly linear or slightly curved plots. Examples of flake size distributions for levels A14 and B2 are shown in Figures 8 and 9, respectively, for linear and roughly linear curve shapes. The lack of complete linearity for semi-log flake size distribution curves for most excavation levels is best explained by indications that flaking of small cobbles to obtain flakes for tools was being done at this site as well as bifacial reduction of flake blanks to produce dart points. Also, perhaps a few small dart points

were made from flat cobbles instead of flake blanks, which would involve some primary reduction before bifacial reduction.

Flake size distribution by excavation level is shown in Figure 10. There is a trend toward higher percentages of small size flakes in later time. This same trend occurred at sites 41WH19 (Patterson et al. 1987:Figure 20) and 41HR315 (Patterson 1980:Figure 19). This trend in flake size distribution is consistent with a trend toward smaller size dart points in later time, with corresponding use of smaller flake blanks.

Many small quartzite and chert pebbles, with diameters under 15 mm, were recovered at all excavation levels. Small pebbles may occur naturally in Brazos River Valley sands.

FIRED CLAYBALLS

A total of 28,842 fired clayballs were recovered from excavation at 41FB223. Counts of clayballs by excavation pit are given in Table 14, and counts of clayballs by equivalent level are given in Table 15. No clayballs were found above equivalent level A6. As observed at sites 41WH19 (Patterson et al. 1987) and 41FB42 (Patterson et al. 1993b), clayballs were used at site 41FB223 from the Late Paleo-Indian through the Late Archaic periods, and even later at sites 41WH19 and 41FB42. The total number of clayballs at site 41FB223 is the largest number found so far at any site in inland Southeast Texas (Patterson 1989). The unexcavated portion of site 41FB223 may contain several hundred thousand clayballs.

The specific uses of clayballs at sites in Southeast Texas are not well-defined. Clayballs were probably used for cooking and perhaps sometimes for heat treatment of chert. Hudgins (1993) has demonstrated experimentally that clayballs can be used to roast meat. Clayballs retain heat longer than hot wood coals. Clayballs were not a preferred method of cooking meat or heat treatment of chert, however, because only about 13% of prehistoric sites of inland Southeast Texas have clayballs (Patterson 1989). It has been proposed (Patterson 1989) that clayballs may have been used seasonally to roast plant food materials at locations near appropriate plant harvest areas.

It is typical in Southeast Texas, that for sites with many clayballs, there will be nearby sites with few or no clayballs. For example, site 41FB95 (Patterson and Hudgins 1987) has clayballs, but adjacent site 41FB3 (Patterson et al. 1993a) does not have clayballs. Counting recent data from sites 41WH73 and 41FB223, there are only 16 published sites of inland Southeast Texas where over 100 clayballs were found, and only 6 sites in this region with over 1000 clayballs. Apparently, only a few locations had access to sufficient food resources that would justify the large-scale use of clayballs. At sites such as 41FB223, where large numbers of clayballs were made for apparently specialized food processing, clayballs may have been used for more general cooking purposes, since clayballs were already available.

MISCELLANEOUS ARTIFACTS

A bone pendant (Figure 7E) with an incised groove was found in Pit E at level A14. It is similar to a specimen from site 41HR315 (Patterson 1980:Figure 11J). Specimens from 41FB223 and 41HR315 both appear to be from the Late Archaic period. The tip of a deer antler tine was found in Pit H at level A14, which may have been used as a pressure flaking tool.

In analysis of the vertebrate remains, two bones that had been modified were found. One of these is from an unidentified bone. It is 21 mm long, oval at the broken end which is 4.2 mm wide, and tapers to 3.0 mm at a rounded end. All edges are smoothed. It was from level A6 in Pit K at 20-30 cm. The other item is a 38 mm long fragment of a deer humerus that is irregular in shape with all edges rounded and smoothed, recovered in Pit J at the 90 to 100 cm level. These items are not illustrated.

Pieces of asphalt were found in several pits at several excavation levels, as shown in Table 16. Asphalt was probably used to haft projectile points throughout the occupation sequence at this site.

Two pieces of red ochre were found in each of two excavation levels in Pit T, at level A17 and Level B2.

HUMAN REMAINS

Several human bones were found in two of the westernmost pits. Skull fragments were found in Pit K at a depth of 165 cm (excavation level B2), and a partial diaphysis (shaft) of a humerus was discovered about 1.5 m away at the same depth in the north wall of Pit T (see Figures 1A and 1B). Both skull fragments and humerus are of adults.

Fragmentation of the skull is a usual trait of burials in this region, being due to collapse from the weight of the overlying soil. Here, most fragments were found "articulated", as is usual for more complete burials. The fragments comprise about 20% of a complete skull. They are from the upper and rear parts of the skull (frontal, parietal, and occipital bones), with no identifiable fragments from the facial area (brow ridges, eye orbits, zygomatic bones, maxilla, etc.) and none of the thick bone from the temporal regions (mastoid process, petrous portion). Also, no human teeth were found, nor any human bone fragments other than skull and the isolated humerus.

The skeletal parts used to determine sex are absent. Size and thickness of bone can be sexual indicators, but there is much overlap in this regard between the sexes for burials in this region. There is nothing unusual about the size or thickness of the bone at this site.

The bones are in a good state of preservation, especially the skull fragments. They are stained a light brown color from being in the soil, but the staining is somewhat lighter than that of most burials from this region. With the sandy nature of the soil, the underlying clay, and the topography (hill), a high rate of ground water flow, and thus poor bone preservation, would be expected. This seems to be confirmed by the scarcity of unburned faunal material at the site (see section on faunal analysis). So the good preservation of the human remains and their light staining would indicate that the burial is quite late, say Late Prehistoric or even Historic. In fact, it can not be ruled out that the remains are non-Indian, because of lack of proper diagnostic portions of the skeleton, such as teeth.

The good state of preservation of the bones also rules out differential preservation as a reason for the lack of the other bones. Animal burrowing or even large scale soil erosion and (re)deposition also seem unlikely causes. It thus appears that either (1) several larger pieces of skull and a humerus fragment from a burial were somehow redeposited here, and the skull pieces subsequently fractured, or (2) a burial here was considerably disturbed, probably in modern times, with only a small portion of the skull still in its original location.

No evidence of disease, unusual dietary conditions, or trauma was noted in the bone. No artifacts were found with the remains. The only red ochre pieces found at the site came from levels A17 and B2 of Pit T. They may have been associated with this burial; red ochre is often found with burials in this region.

FAUNAL ANALYSIS

The faunal remains that were retained on the 1/4-inch mesh screens were compared to bones of known animals. Identification was carried to the extent possible by the condition of the bones. Nearly all were fragmented to a great extent. Except for a few apparently recent intrusive elements, all appear to have been exposed to fire or heat. Color varies from white through browns to black with a few being bluish. Only 1550 bones and fragments were recovered from the 22 pits. It is probable that all unburned bones that may have been in the soil were decomposed by soil actions.

About 24% of the bones could be relegated to some taxonomic status. Of this fraction, 49% are of turtles, 37% are of mammals, 10% are of fish, 2% are of snakes, and 2% are of birds.

The paucity of faunal remains from this site presented a challenge to get the maximum data retrieval possible with minimum of identifiable remains. The fish bones were of particular interest since vertebrae of some taxa are not easily identified. Some of these bones are unidentifiable fragments and some are parts of bones that could be from any of several species of fish. Fragments of a dorsal spine and a pectoral spine are of some species of catfish. A dentary is of a largemouth bass. Vertebrae of gars include some with centrum diameters of 5 to 10 mm and one of 22 mm. These are probably from at least 4 individual gars.

The assemblage includes a few Teleost fish vertebrae that have diameters of centra of 6 to 9 mm and these were selected for more effort to try to identify them. References were checked to determine the varieties of fish that may have been present at the time of the deposits. Since there has not been a significant environmental change in the interim, it is probable that the current list of native species from the area would be a good indication of the available fish at the time of prehistoric occupation.

Fort Bend County is in the approximate center of Area 2 (coastal prairie) in Hubbs (1982) tabulation of Texas fish. This shows that 53 species of 33 genera of 15 families of native fish could possibly be available in the waters near the site.

Direct comparison is the desired method of identifying bones. In the comparative bone collections of McClure and the Houston Archeological Society, all but two of the families are represented. The missing families are Belonidae which includes the Atlantic needlefish and Percidae which includes a logperch and three species of darters. The needlefish ascends the river to spawn but can be eliminated from consideration due to its elongated body which would not have vertebrae shaped like those that were recovered. The Percidae species can be eliminated since the species in this area are never longer than 15 cm and would not have vertebrae as large as 6 mm.

The Lepisosteidae, Amiidae, Anguilidae, Clupeidae, Catostomidae, and Mugilidae were compared to those that were being examined and were eliminated from consideration due to their significantly different morphology. Vertebrae of available specimens of Cyprinidae, Cyprinodontidae, Poeciliidae, and Antherinidae were measured and diameters were extrapolated for the maximum lengths indicated by McClane (1965), Eddy and Underhill (1978), and Hoese and Moore (1977). Based on this effort, these four families can be eliminated because of their small sizes. Thus, there are only three families of fish that need to be examined closely to resolve the uncertainty.