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A Wooden Mortar and Pestle
From Val Verde County, Texas
MICHAEL B. COLLINS AND THOMAS ROY HESTER

ABSTRACT

This paper describes a wooden mortar and pestle found by spelunkers in a small cave near Pandale, in Val Verde County, Texas. Cactus seeds (Opuntia sp.) were found in the mortar, suggesting that one function of the implements was the preparation of plant parts for food. Ethnographic accounts have mentioned the presence of wooden mortars and pestles in the aboriginal cultures of southwestern Texas and northern Mexico; although perishable artifacts are abundant in the dry caves of this region, the specimens described in this paper are the first of their type to be reported.

In February, 1968, David G. Cooke and Glenn Southard (spelunkers from Ozona, Texas) entered a small cave near the mouth of Big Fielder’s Canyon in the vicinity of Pandale, Val Verde County, Texas (Fig. 1). Cigarettes accidentally dropped behind a ledge by the spelunkers led to the discovery of a wooden mortar and pestle evidently cached beneath an overhang in the ledge. Cooke and Southard reported their find to the Department of Anthropology, The University of Texas at Austin. The authors, accompanied by Mary Ringwood Bacon of the Texas Archeological Salvage Project, examined and photographed the specimens at Ozona in March, 1968.

The cave in which the mortar and pestle were found is in the Pecos River canyon near Pandale Crossing, approximately 22 miles north of Langtry and 65 miles northwest of Del Rio, Texas. The region is an extensive tableland of limestone (the Edwards and Stockton plateaus) that has been deeply dissected by three major rivers, (Pecos, Rio Grande, and Devils) and countless small streams. Rockshelters and caves are numerous in these canyons and many show evidence of aboriginal occupation. Aridity has occasioned the preservation of a wide variety of perishable debris and artifacts in some of the shelters. The archeological material from these sites exhibits the general characteristics of the widespread Desert Culture (Suhm and others, 1954; Lehmer, 1960; Johnson, 1964; Story, 1966). Occupation by peoples who practiced gathering of plant foods, fishing, and hunting evidently began at least 6,000 years ago and lasted until historic times. Cultural change was minimal over this entire period—even the brief influx of bison hunters at about 700 B.C. and the introduction of the bow and arrow at about A.D. 1400 failed to alter significantly the economy.
based on hunting, gathering and fishing (Dibble, 1968; Johnson, 1964; Story, 1966). The prehistoric cultural trait relevant to the present paper is the gathering and preparation of *Opuntia* (prickly pear) tuna for plant food. Prickly pear tuna (as well as lechuguilla and sotol) provided a substantial part of the diet throughout the long periods of
occupation. Various techniques of baking in earth ovens seem to have been employed in preparation of the agave and sotol whereas prickly pear tuna was evidently eaten raw or prepared in various ways (including pulverization). Human feces (currently under analysis) from late prehistoric deposits in a shelter near the mouth of the Pecos River contain whole Opuntia seeds as well as other plant and animal parts (V. M. Bryant, Jr., personal communication). It seems clear that gathering of desert plant foods was the major means of subsistence for over 8,000 years. Bedrock mortars and oval-basin metates (both portable and in bedrock) occur at most sites in the area and presumably served in food preparation. Pestles are rare (or have escaped recognition). The large samples of perishable artifacts from the area contain little or nothing that would suggest the use of wooden crushing implements.

Historic documents record the presence of numerous groups, mostly of Coahuiltecan linguistic affiliation, in the Edwards Plateau and Rio Grande Valley regions. These were food gatherers who also practiced fishing and some hunting. Jumanos and numerous other Indian groups inhabited the general region in the 16th, 17th, and 18th centuries. Apaches were reported in Big Fielder’s Canyon in 1879, and Comanches crossed the region frequently during the 19th century (Hackett, 1926 and 1931; Newcomb, 1961; Bolton, 1911; Kirkland, 1942; Ruecking, 1955; Campbell, ms.). The various Coahuiltecan groups were frequently reported to have gathered Opuntia tunas and one reference mentions use of wooden mortars (Ruecking, 1955; Bandelier, 1905).

The wooden mortar and pestle were discovered in a small cave (University of Texas site designation: 41 VV 425) on a rocky hillside on the west bank of the Pecos River. The cave is in a thick ledge about one-third of the distance up the hillside from the river, and just north of the mouth of Big Fielder’s Canyon. There are numerous other small caves, crevices, and shelters in the immediate vicinity, most of which seem to be devoid of cultural remains. The cave faces south and is about 10 feet high at the mouth and only 2 to 3 feet wide; it extends back into the hill for a distance of about 15 to 20 feet. Near the back of the cave, a ledge extends into the passageway, and it was on the surface beneath this ledge that the mortar and pestle were found. The mortar lay on its side and the pestle was nearby. The floor of this small cave is covered with roof spalls and there is no evidence of any cultural deposit; however, some smoke staining on the roof is present at the mouth of the cave. A few lithic artifacts (including a contracting stem dart point) were collected from the hillside below the cave.

The mortar (Fig. 2, a, b, d and e) appears to have been fashioned
Figure 2. Wooden mortar and pestle from 41 VV 425. a, interior cavity. b, side view with pestle in position. c, pestle with crushing end up. d, side view of mortar—note charred area below rim on interior. e, mortar base—note concavity.

from a section of a tree with fine, straight-grained wood (probably pine), from which the bark had been removed. The height of the specimen is 31 cm., with maximum diameters at the rim and base of 17.6 and 18.3 cm. The interior cavity is 18 cm. deep; the lip of the rim has been rounded and smoothed, and is beveled along one-third of its interior circumference. The interior is roughly conical in vertical section (Fig. 2, a; Fig. 3). There is a charred area extending in a band most of the way around the interior just below the beveled rim, sug-
suggesting that the cavity was formed by a process of alternately charring and scraping (Fig. 2, d; Fig. 3, b, c). The interior is polished from use; several small pebbles, embedded at the bottom of the cavity, are ground smooth, and cactus seeds (Opuntia sp.) were discovered in the cracks (caused by desiccation) along the sides (Fig. 2, a). The cactus seeds were tightly wedged in the cracks and had to be pried out with a knife blade; evidently, the mortar was used after cracks had developed.

The central part of the base of the mortar is a concave depression about 2 cm. deep (Fig. 2, e; Fig. 3, e). The rim of the basal depression is rounded and smoothed.

The exterior of the mortar does not appear to have been modified to any extent. There is a small oval depression opposite the charred band on the interior. It was impossible to determine if the depression was the result of charring and scraping, or of wear, although it appeared to be slightly charred.

The pestle (Fig. 2, c) is a section of what is tentatively identified as a pecan shoot, from which the branches have been trimmed. The entire length is smoothed, and the knobs left by the removal of the branches are polished, probably from repeated handling. One end is conical and somewhat rounded; it is this end that was evidently used in conjunction with the mortar (upper end in Fig. 2, c). The opposite end which is also rounded but exhibits several cut marks, has not been smoothed, and shows no evidence of use. Large cracks, resulting from desiccation, extend almost the entire length of the specimen. It is 58 cm. long, and has an average diameter of about 4.5 cm.

Wooden mortars and pestles have not been previously recorded in the archeological literature of Texas and northern Mexico. Alonso de Leon (1905) states that Coahuiltecan bands in Nuevo Leon, Mexico, used wooden mortars to crush seeds and other foods, but descriptive details are lacking. Cabeza de Vaca recorded the use of wooden pestles by Indians in either southwestern Texas or northeastern Mexico. These pestles were used to pulverize mesquite bean pods, the juice of which was mixed with earth and then consumed (Bandelier, 1905).

Wooden mortars and pestles have been recorded among cultures over much of North America (Hodge, 1912; Driver and Massey, 1957), but none have been noted in southwestern Texas or northeastern Mexico.

SUMMARY

A wooden mortar and pestle from near Pandale in Val Verde County, Texas, have been described, and represent the first examples of these implements from this region. The presence of cactus seeds in
FIGURE 3. Vertical section of mortar. a, charred area on exterior, b,c, charred band on interior. d, beveled rim. e, basal concavity.
the mortar suggests at least one function of the implements—the processing of plant parts for food. While ethnographic accounts dealing with the Indians of southwestern Texas and northeastern Mexico note the presence of the wooden mortar and pestle, no examples of these artifacts have come to light in the extensive excavations of dry shelters in this area.

ACKNOWLEDGMENTS

The authors would like to thank Dr. T. N. Campbell, Professor of Anthropology, The University of Texas at Austin, for his helpful criticisms regarding this paper. Identification of the *Opuntia* seeds from the mortar was made by Vaughn M. Bryant, Jr., of the Department of Botany, The University of Texas at Austin; for this and the information he supplied on his analysis of human feces from site 41 VV 162, we are grateful.

ADDENDA

After this paper was submitted for publication, a fragment of wood from the mortar was examined by Mr. Marvin A. Stokes of the Laboratory of Tree-Ring Research at the University of Arizona. Mr. Stokes believes that the wood is conifer, possibly pinyon (*Pinus cembroides*).

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Texas Archeological Salvage Project and the Texas Archeological Research Laboratory, The University of Texas at Austin.
Coral Snake Mound
X16SA48

HARALD P. JENSEN JR.

ABSTRACT

The second and final season of salvage excavations at Coral Snake Mound is reported. Excavations demonstrate that the mound was built in three stages. Several artifact caches together with a number of cremations and burials were recovered. Bone tempered (Caddoan-appearing) sherds were found together with a number of Lower Valley wares including Marnsville Plain, Marksville Incised and Lake Borgne Incised. It is suggested that this association argues for a reconsideration of Krieger's alignment of Alto I with Marksville-Hopewell.

INTRODUCTION

The Coral Snake Mound (X16SA48) was investigated early in 1965 by personnel of the Texas Archeological Salvage Project under the direction of Burney McClurkan. McClurkan's report (1966) describes the physical appearance of the mound prior to excavation and its archeological content.

Coral Snake Mound is located in the NE 1/4 of the SE 1/4 of Section 33, T6N, R 13 W, in Sabine Parish, Louisiana. The mound itself was situated on a terrace remnant of the Sabine River, well within its flood plain. We were informed by a man who once owned the property that at the turn of the century, the mound and surrounding area was devoid of vegetation and that all of the area but the mound was planted in cotton. Around 1910, the area was abandoned, and now thick stands of large mixed pine and hardwoods together with dense undergrowth cover the area.

The following report describes the 1966–1967 excavations at the mound. Fourteen days were spent excavating the remaining portions of the mound (Fig. 1). The unexcavated portions included the southeastern quarter and sections of the other quadrants. It was hoped that further excavation in these areas would give us information on mound construction and provide a more complete artifact sample. Previous investigations had recovered what appeared to be Caddoan sherds (incised decoration and bone temper) together with Marksville pottery. The unique nature of this apparent association gave further impetus to our second season at the mound.

The advice and criticism of several persons was of considerable
help during the analysis of materials from Coral Snake Mound. Edward B. Jelks, R. K. Harris and Burney McClurkan offered valuable suggestions throughout all phases of this report. Kathleen Gilmore and Lawrence Aten assisted with the ceramic analysis. Mark Parsons served as field assistant during our work at the mound, and James V. Sciscenti helped edit portions of the manuscript.

EXCAVATION PROCEDURES

Initial steps in excavation consisted of removal of slump sand and
cleaning the surface of vegetation; backdirt from the 1965 season was shifted from the lower parts of the mound. During the clearing, a number of survey stakes and pins were found. An expanded and corrected grid was set up utilizing these stakes, thus tying our data in with McClurkan’s.

Artifactual material and features were relatively scarce in the mound fill. Because of this, unexcavated areas rather than squares were the excavation units. The various areas were shovel scraped horizontally, and deeper tests were made for profiling the remaining portions of the mound.

**STRATIGRAPHY**

Three distinct stratigraphic zones were encountered at Coral Snake Mound (Figs. 2 and 3).

**Zone II** consists of two related units. Zone IIb is a black, sandy, humus-stained layer, ranging from 12 to 30 centimeters in thickness. The humus stain is due to a considerable amount of decomposed organic matter. The soil color varies considerably, depending upon the

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**Figure 2.** Profile of mound, N–S.

**Figure 3.** Profile of mound, E–W.
type of parent organic material. The zone is fairly well developed and is uniform throughout much of the area.

Zone IIIA is a mottled tan sand layer, characterized by a uniform appearance and occasional concentrations of iron-stain lines in the lower portion. The layer varies in thickness near the center of the mound with a maximum thickness of 2.1 meters, which tapers to less than 30 centimeters toward the periphery of the mound.

Zone II comprises what might be called the primary mound. The fill is composed of a mottled brown sand with a wet consistency similar to that of Zone III; however, there is a noticeable color difference when Zone II and III sands are dried and compared. Zone II fills the subfloor basin and extends beyond the edge of the basin for a distance of at least one meter.

Zone I, the surface upon which the mound was constructed, is composed of a medium grained sand containing a trace of manganese concretions. The zone reaches a maximum depth of 1.8 meters, and gradually grades into a red-orange sandy silt of undetermined depth.

MOUND CONSTRUCTION AND BUILDING STAGES

Three distinct stages of construction are involved at Coral Snake Mound. During the first stage, a basin-shaped depression 1.2 meters deep and 6 meters in diameter was excavated into the existing floodplain. The level of the floodplain was at an elevation of between ninety-five and ninety-six feet. Subsequent to the filling of the basin, cremations were intruded and several fire basins were prepared. Fill for the basin extended somewhat above the original floodplain (ca. 60 centimeters to 90 centimeters at the center). Stage II, then, formed what might be called the primary mound—a low, conical structure about 90 centimeters high and 12 to 15 meters in diameter. Much of this primary mound was composed of borrow from the first stage. Apparently, fill from the basin was piled around the edges of the pit; profiles show that some of this was left in place when refilling took place. This undisturbed fill formed the outer edge of the primary mound.

In the final building period, the primary mound was completely covered with sand; at various intervals, cremations, hearths, burials and caches were placed in the fill of the mound. Some of the fill came from a borrow pit encircling the mound, though this borrow pit could not have been the source for all of the fill used, as the completed mound was 3 meters high and nearly 30 meters in diameter. No other borrow pits were found in the vicinity of the mound.

Subsequent to the completion of Coral Snake Mound, several pot-
holes were dug into the mound. Three of these were noted by McClurkan (1966: 4–5), and two additional and apparently quite old potholes were found during 1966. These potholes could only be seen in vertical profile due to the nature of mound fill. Excavations were constantly impeded by slump; a large cave-in of the north-south wall of the southeast quarter prevented measurement of the upper portions of these potholes, which are represented by hatched lines on the figures.

ARCHEOLOGICAL FEATURES

A total of fifty-nine archeological features were encountered during excavations at Coral Snake Mound. These features include artifact caches, fire basins, burials, cremations, ochre concentrations, and some single artifact finds. Most of the features encountered during 1966, as in the earlier work, had a funerary function. The presence of human bone and the presence of artifact and ochre caches support this conclusion. The highly acid nature of mound soils precluded the discovery of intact or well preserved unburned bone. In many cases, only enameled tooth caps which had been in contact with copper were preserved. In spite of poor bone preservation, I believe that all artifact caches represent burial offerings. It would appear that the Coral Snake Mound functioned as a cemetery.

THE ARTIFACTS

A variety of artifacts were found in the mound fill and in architectural features described above. The following artifact classes are recognized for Coral Snake Mound: stone, ceramics, metal, pigment and glass.

STONE

Large Stemmed Points (Fig. 4)

Number of Specimens: 3 (Table 1)

Dimensions: Lengths, 182 mm. and 187 mm.; widths, 56 mm. and 59 mm.; thickness, 9 mm. each for Feature 30 specimens. The point from Feature 31 is 150 mm. long, 36 mm. wide, and 9 mm. thick.

Description: The specimen blades are symmetrical and triangular. All three specimens have large thinning flake scars radiating from each edge on both faces and the edges have been retouched. Well made shoulders are present, forming a 90 degree angle with the blade on one specimen, and being slightly barbed on the other side. Two of the points have stems showing transverse burin blows on the base; the remaining point has a slightly expanding stem. The two points found in Feature 30 are made of gray (Duck River?) chert. The
TABLE 1

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<td>N494 E505.9</td>
<td>99.4</td>
<td>3</td>
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<td>Large stemmed (1)</td>
<td>31</td>
<td>N483.5 E501.1</td>
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<td>3</td>
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<tr>
<td>Gary (3) (one woden)</td>
<td>22</td>
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</tr>
<tr>
<td>Gary (woden variety, barbs)</td>
<td></td>
<td>N517 E494</td>
<td>97</td>
<td>3</td>
</tr>
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<td>Gary (woden variety, barbs)</td>
<td></td>
<td>Mound fill</td>
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</table>

Figure 4. Three large stemmed points.
<table>
<thead>
<tr>
<th>Type</th>
<th>Feature Number</th>
<th>Horizontal Location</th>
<th>Vertical Location</th>
<th>Building Stage</th>
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<tbody>
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<tr>
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<td>3</td>
<td></td>
</tr>
<tr>
<td>Kent (wooden variety)</td>
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<td>97</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td>Kent (wooden variety)</td>
<td>N515 E516</td>
<td>97.5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Kent</td>
<td>N497 E513</td>
<td>95.2</td>
<td>2</td>
<td></td>
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<tr>
<td>Kent</td>
<td>N492.5 E507</td>
<td>94.3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Kent (5)</td>
<td>Mound fill</td>
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<td>96.2</td>
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<tr>
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<td>2</td>
<td></td>
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<tr>
<td>Palmillas Variety I (2) (one wooden variety)</td>
<td>Mound fill</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Palmillas Variety II</td>
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<tr>
<td>Palmillas Variety II</td>
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<tr>
<td>Palmillas Variety II</td>
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<td>3</td>
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<tr>
<td>Misc. Dart Point I</td>
<td>N481 E508</td>
<td>96.7</td>
<td>2</td>
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<tr>
<td>KNIVES</td>
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<tr>
<td>Stemmed Knife</td>
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<td></td>
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<td>Form I</td>
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<tr>
<td></td>
<td>N498 E501</td>
<td>94.4</td>
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<td>Form II</td>
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<td>94.1</td>
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<td></td>
<td>N496.6 E498</td>
<td>95.6</td>
<td>2</td>
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<td></td>
<td>N517 E515</td>
<td>97.8</td>
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<tr>
<td>Stemmed Knife</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>N485.5 E511</td>
<td>98.8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N501.6 E496</td>
<td>92.2</td>
<td>2</td>
<td></td>
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<tr>
<td></td>
<td>N483 E502.6</td>
<td>99.9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ovate Knives</td>
<td>N493 E502</td>
<td>98.0</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N485 E505</td>
<td>100.1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronson Knives</td>
<td>N508 E514</td>
<td>96.8</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td>Harvey Knives (5)</td>
<td>N497 E503</td>
<td>92.2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Broken Knives &amp; Dart points</td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken Knives &amp; Dart points (9)</td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MISCELLANEOUS STONE TOOLS</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Perkin Pikes (2)</td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pebble Graver (1)</td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varia (1)</td>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
shouldered specimen has a parallel stem, the base of which was removed with a transverse burin blow. The barbed point has an expanding stem with a shallow concave base. This second point is unique in that its edges and both faces have been heavily ground. The third point came from Feature 31. It was made of a brown chert. This point has barbed shoulders, a slightly contracting stem, and the base removed by a transverse burin blow.

Dart Points

Gary Points (Fig. 5, c and d)
Number of Specimens: 5 (Table 1)
Dimensions: Lengths (on four specimens): 30 mm. to 38 mm., average 34.2 mm.; widths, 21 mm. to 29 mm., average 24 mm.; thickness, 6 mm. to 8 mm., average 6.8 mm.
Description: These are points with symmetrical blades and straight to slightly concave edges, contracting stems and straight bases. Two have cortex bases of the woden variety. Three of the specimens are from a cremation, Feature 22. Two points show burning, numerous carbon stains and fire spalls. One of the remaining points had its barbs removed by burin-like blows.
Material: local chert.

Kent Points (Fig. 5, a and b)
Number of Specimens: 12 (Table 1)
Dimensions: Lengths (on 9 measurable specimens): 25 mm. to 42 mm., average 36.2 mm.; widths (on 11 measurable specimens), 13 mm. to 35 mm., average 21.2 mm.; thickness (on 11 measurable specimens), 5 mm. to 10 mm., average 7.4 mm.
Description: These are points having triangular blades with slightly convex edges, well developed shoulders with two examples of barbed shoulders. Stems average one-fifth the entire point length and are parallel sided to slightly expanding. Bases are slightly convex or have cortex present. The woden variety includes four examples. A series of burin blows is present on the tip end of one Kent woden point, made apparently after the tip broke off. Under close examination with a binocular microscope, some wear and a minor amount of use polish on the bit edge was observed.
Material: local chert.

Palmillas, Variety I (Fig. 5, e and f)
Number of Specimens: 4 (Table 1)
Dimensions: Lengths (on 2 measurable specimens): 32 mm. to 34 mm., average 33 mm.; widths, 20 mm. to 28 mm.; average 24.2 mm.; thickness, 8 mm. to 10 mm., average 8.7 mm.
Description: These rather poorly made points have triangular blades, straight to bi-convex edges, expanding stems and convex bases. Shoulders are pronounced and three specimens are barbed. Cortex is retained on the base of one specimen.

Material: local chert.

Palmillas, Variety II (Fig. 5, g and h)
Number of Specimens: 3 (Table 1)
Dimensions: Lengths, 43 mm. to 48 mm., average 46 mm.; widths, 18 mm. to 21 mm., average 20 mm.; thickness, 8 mm. to 10 mm., average 8.7 mm.
Description: These are asymmetrical points having long blades with rounded shoulders, expanding stems, and round, bulbous bases.
Material: Petrified wood, 2; local chert, 1.

Miscellaneous Dart Points (Fig. 5, i and j)
Number of Specimens: 3 (Table 1)
Dimensions: Length, no information; widths, 24 mm. to 32 mm., average 27.3 mm.; thickness, 9 mm. to 17 mm., average, 15 mm.
Description: Blades are triangular in this class, with well developed shoulders and barbs; stems are parallel or broad to slightly contracting, and bases are convex.
Material: Local chert, 1; gray dolomite (non-local), 1; gray quartzite (non-local), 1.

Knives

Stemmed Knife, Form I (Fig. 6, a)
Number of Specimens: 2 (Table 1)
Dimensions: Length, no information; widths, 30 mm. and 33 mm., average 31.5 mm.; thickness, 11 mm. and 12 mm., average 11.5 mm.
Description: The blades are triangular, shouldered, but unbarbed, and stems are parallel to slightly expanding, with straight bases. One retains cortex on the base; the other base is bifacially retouched.
Material: Petrified wood.

Stemmed Knife, Form II (Fig. 6, b)
Number of Specimens: 4 (Table 1)
Dimensions: Lengths, 43 mm. to 59 mm., average 52 mm.; widths, 22 mm. to 27 mm., average 25 mm.; thickness, 10 mm. to 12 mm., average 10.8 mm.
Description: These blades have crudely chipped symmetrical bi-convex edges, weak shoulders, and narrow, contracting stems.
Material: Petrified wood.

Stemmed Knife, Form III (Fig. 6, c)
Number of Specimens: 3 (Table 1)
Dimensions: Lengths, 58 mm. to 66 mm., average 61 mm.; widths, 17 mm. to 20 mm., average 19 mm.; thickness, 8 mm. to 10 mm., average 9.5 mm.
Description: These are long, lanceolate shaped bifaces. Stems are quite wide in relation to blade width and shoulders are poorly developed. All show crude workmanship.
Material: Petrified wood.
Figure 6. a, stemmed knife, Form I; b, stemmed knife, Form II; c, stemmed knife, Form III; d and e, ovate knives; g, pebble graver; i, Perkin Pike; j, Bronson Knife; k, strangulated blade and end scraper.

Ovate Knives (Fig. 6, d and e)
Number of Specimens: 4 (Table 1)
Dimensions: Lengths (on 3 measurable specimens), 44 mm. to 47 mm., average 45.7 mm.; widths (on 3 measurable specimens), 21 mm. to 27 mm., average 23 mm.; thicknesses, all 10 mm.
Description: These are ovate, rather symmetrical blades, which retain residual cortex.
Material: Petrified wood.

Bronson Knives (Fig. 6, j)
Number of Specimens: 2 (Table 1)
Dimensions: Length (of one specimen), 52 mm.; widths, 20 cm. and 22 cm.; thickness, 10 mm. and 14 mm.
Description: These are long, parallel sided slabs which are bifacially worked on two edges. One specimen is broken, the other has chipping extending up the edges to form a rounded end.
Material: Petrified wood.

Harvey Knives (Fig. 6, f and h)
Number of Specimens: 5 (Table 1)
Dimensions: Lengths, 44 mm. to 75 mm., average 59.2 mm.; widths, 20 mm. to 34 mm., average 25 mm.
Description: These irregular to elongated pieces of stone show bifacial chipping along at least one edge. The cutting edges are straight (2 examples) or crescent shaped (3 examples).
Material: Petrified wood.

Unidentifiable Knife and Point Fragments
Number of Specimens: 12 (Table 1)
Description: These fragments are broken to the extent that diagnostic features are missing. They are all bifacially worked.
Material: Local chert, 8; petrified wood, 2; novaculite, 1.

Miscellaneous Stone Tools

Perkin Pikes (Fig. 6, i)
Number of Specimens: 2 (Table 1)
Dimensions: Lengths, 45 mm. and 56 mm.; widths, 23 mm. each; thickness, 12 mm. and 22 mm.
Description: These elongated rock chunks retain cortex on the bases and are pointed at the opposite ends. The pointed ends are formed by heavy bilateral chipping.
Material: Local chert, 1; petrified wood, 1.

Pebble Graver (Fig. 6, g)
Number of Specimens: 1 (Table 1)
Dimensions: Length, 39 mm.; thickness, 10 mm.
Description: This long, thin flaked specimen is triangular in cross section, with a point at one end and cortex on the base. The graver
has flake scars on all three faces and appears to have been fashioned from a core.
Material: Local chert.

Varia (Strangulated Blade and End Scraper, Fig. 6, k)
Number of Specimens: 1 (Table 1)
Dimensions: Length, 31 mm.; width, 22 mm.; thickness, 8 mm.
Description: This is a cortex flake with both lateral edges notched. The distal end has been steeply retouched to form a scraping edge.
Material: Local chert.

Cores
A number of different core types were present at the site; the majority of these are made on locally found chert pebbles. Table 2 gives the distribution of the specimens.

Debitage and Debris
Debitage and debris from the site consists of by-products of the main industry. Some of the flakes are residue from the preparation and treatment of cores; others consist of trimming flakes derived from manufacture of bifacial tools. Table 3 presents the distribution of the material.

CERAMICS
A detailed paste and temper analysis was made on the ceramics from Coral Snake Mound. Bone tempered sherds usually associated with Caddoan archeological manifestations were found within the mound fill in contexts of unquestionable Marksville age. Table 4 presents provenience data for this material.

### TABLE 2
Core Distribution at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Type</th>
<th>No. Specimens</th>
<th>Material</th>
<th>Provenience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortex Cleavage</td>
<td>4</td>
<td>Petrified Wood</td>
<td>Mound Fill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Feature 61, N495 E500 91.9 ft.</td>
</tr>
<tr>
<td>Informe</td>
<td>4</td>
<td>Local chert, 3</td>
<td>Mound Fill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quartz, 1</td>
<td>N492.5 E499 93.6 ft.</td>
</tr>
<tr>
<td>Bipolar</td>
<td>2</td>
<td>Local chert</td>
<td>Mound Fill</td>
</tr>
<tr>
<td>Opposed Platform Cortex</td>
<td>1</td>
<td>Local chert</td>
<td>Mound Fill</td>
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TABLE 3
Debitage and Debris at Coral Snake Mound

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<tr>
<th>Type</th>
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<th>Non-local</th>
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<th>Duck River</th>
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<tr>
<td></td>
<td>Chert</td>
<td>Petrified</td>
<td>Wood</td>
<td>Agate</td>
<td>Dolomite</td>
</tr>
<tr>
<td>Cortex flakes</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Unmodified</td>
<td>158</td>
<td>160</td>
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<tr>
<td>Retouched</td>
<td>4</td>
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<td>Retouched</td>
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<td>Thinning flakes</td>
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<td>Chips</td>
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<td>8</td>
<td>8</td>
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</table>

Sherds from general excavations, and not associated with features, were categorized first by temper types as follows:

- Bone Temper
- Sand Temper
- Grog Temper
- Clay Temper
- Bone and Grog Temper
- Grog and Sand Temper
- Bone and Sand Temper
- Sand and Grog Temper (Grog tempered with bone)

Bone Tempered Sherds: (Fig. 7, c, e, f, g, and i)
- Number of specimens: 13.
- Method of manufacture: coiled.
- Texture: medium to coarse.
- Color: dark red-orange to gray.
- Surface finish: smoothed and wiped (burnished, 2 examples).
- Wall thickness: 5 mm. to 9 mm., average 6.3 mm.
- Form: no diagnostic sherds.
- Decoration: 1 sherd engraved, 1 brushed sherd, 1 punctated sherd, 1 fine line engraved, 9 plain sherds.
- Distribution: (Table 4)

Sand Tempered Sherds:
- Number of specimens: 6.
### TABLE 4

Distribution of Ceramic Artifacts at Coral Snake Mound

<table>
<thead>
<tr>
<th>Type</th>
<th>Horizontal Location</th>
<th>Vertical Location</th>
<th>Stage</th>
<th>Comments</th>
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<td>N477.5 E507.1</td>
<td>98.4'</td>
<td>3</td>
<td>Engraved</td>
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<td></td>
<td>N486 E510</td>
<td>98.7'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N479 E502.1</td>
<td>99.3'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N481.5 E505</td>
<td>100.2'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N481.5 E501</td>
<td>99.3'</td>
<td>3</td>
<td>Brushed</td>
</tr>
<tr>
<td></td>
<td>N480 E503.5</td>
<td>100'</td>
<td>3</td>
<td>Engraved</td>
</tr>
<tr>
<td></td>
<td>N485 E512</td>
<td>99.9'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N507.5 E507.5</td>
<td>96.6'</td>
<td>2</td>
<td></td>
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<tr>
<td>Mound fill (5)</td>
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</tr>
<tr>
<td>Sand temper</td>
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<td>3</td>
<td></td>
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<tr>
<td></td>
<td>N478.5 E502.5</td>
<td>98.8'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N485.5 E513</td>
<td>100.5'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N495 E506</td>
<td>94.6'</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N498 E504.8</td>
<td>95.7'</td>
<td>2</td>
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<tr>
<td></td>
<td>Mound fill</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Grog temper</td>
<td>N491.5 E501</td>
<td>99.3'</td>
<td>3</td>
<td>Punctated</td>
</tr>
<tr>
<td></td>
<td>N486.5 E511.9</td>
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<td>Repair hole</td>
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<td>Mound fill (2)</td>
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</tr>
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<td>Clay (on Lower Valley)</td>
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<td>3</td>
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<tr>
<td>Bone and grog</td>
<td>N485 E507.5</td>
<td>100.1'</td>
<td>3</td>
<td>Everted, rolled lip</td>
</tr>
<tr>
<td></td>
<td>N478 E502.5</td>
<td>98.8'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N479 E502.5</td>
<td>99.9'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N486 E506.5</td>
<td>100.8'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N498 E529</td>
<td>94.8'</td>
<td>3</td>
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</tr>
<tr>
<td>Mound fill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone and sand temper</td>
<td>N489.7 E504.6</td>
<td>98.9'</td>
<td>3</td>
<td>Brushed</td>
</tr>
<tr>
<td></td>
<td>N484 E511</td>
<td>100.5'</td>
<td>3</td>
<td>Round everted rolled lip</td>
</tr>
<tr>
<td></td>
<td>N482 E508</td>
<td>99.9'</td>
<td>3</td>
<td>Brushed or cord impressed</td>
</tr>
<tr>
<td></td>
<td>N481.5 E501</td>
<td>99.3'</td>
<td>3</td>
<td>Brushed</td>
</tr>
<tr>
<td></td>
<td>N489.5 E514.5</td>
<td>99.9'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N486.5 E511.9</td>
<td>100.8'</td>
<td>3</td>
<td>(1 brushed)</td>
</tr>
<tr>
<td></td>
<td>N486.5 E509</td>
<td>100.9'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mound fill (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grog and sand</td>
<td>N482.9 E511.2</td>
<td>98.1'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N481.5 E501</td>
<td>99.3'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N479 E502.1</td>
<td>99.3'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N492.5 E517</td>
<td>99.3'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mound fill (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 4 (Continued)

Distribution of Ceramic Artifacts at Coral Snake Mound

<table>
<thead>
<tr>
<th>Type</th>
<th>Horizontal Location</th>
<th>Vertical Location</th>
<th>Stage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Valley</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>paste clay</td>
<td>N491.1 E502.7</td>
<td>98.8'</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N499 E499</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N499 E506</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mound fill (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marksville</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stamped</td>
<td>N489 E512</td>
<td>100.5'</td>
<td>3</td>
<td>Rim sherd</td>
</tr>
<tr>
<td></td>
<td>N500.5 E500.5</td>
<td>94.9'</td>
<td>2</td>
<td>(Feature 14)</td>
</tr>
<tr>
<td></td>
<td>Mound fill (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Borgne</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incised</td>
<td>N495 E508</td>
<td>94.9'</td>
<td>2</td>
<td>Rim</td>
</tr>
<tr>
<td></td>
<td>Mound fill (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marksville</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plain</td>
<td>N514.2 E489</td>
<td>99.1'</td>
<td>3</td>
<td>(Feature 9)</td>
</tr>
</tbody>
</table>

Texture: medium.
Color: gray-buff exteriors; interiors, gray to black; cores, black to gray.
Surface finish: smoothed.
Wall thickness: 5 mm. to 8 mm., average 6.2 mm.
Form: no information available.
Decoration: none.
Distribution: (Table 4)

Grog Tempered Sherds:
Number of specimens: 4.
Texture: medium to coarse.
Color: exteriors, red-orange to gray; interiors, dark brown to black; cores, orange to gray black.
Surface finish: smoothed.
Wall thickness: 5 mm. to 7 mm., average 6.3 mm.
Lip: (1 example) rounded and excurvate rolled; diameter, 18 cm.
Base: (1 example) flat; 10 cm. diameter.
Decoration: 1 punctation.
Miscellaneous: 1 drilled repair hole, from one side only.
Distribution: (Table 4)

Clay Tempered Sherds:
Number of specimens: 4.
Method of manufacture: coiled.
Texture: laminated, flaky paste.
Temper: clay.
Color: exterior, yellow-orange.
Surface finish: smoothed surface looks floated.
Form: no information.
Wall thickness: 7 mm. to 8 mm., average 7.7 mm.
Comment: These sherds appear untempered; their lamellar structure and paste are similar to Techefuncte plain wares.
Distribution: (Table 4)

Bone and Grog Tempered Sherds:
Number of specimens: 6.
Method of manufacture: coiled.
Texture: medium coarse.
Color: exterior buff, red-orange, gray; interior, orange to gray; core, dark gray, orange.
Surface finish: smoothed.
Wall thickness: 5.5 mm. to 7 mm., average 6.2 mm.
Lip: (1 example) rounded and rolled, excursive.
Base: (1 example) flat.
Vessel shape and size: no information; no decoration.
Distribution: (Table 4)

Bone and Sand Tempered Sherds:
Number of specimens: 9.
Method of manufacture: coiled.
Texture: medium.
Color: exterior, orange to buff-gray; interior, orange to buff-gray; core, light gray to dark gray.
Surface finish: smoothed.
Wall thickness: 4.5 mm. to 8 mm., average 5.9 mm.
Lip: (1 example) rolled, rounded, excursive.
Vessel form: no information.
Decoration: brushing (5 examples).
Distribution: (Table 4).

Grog and Sand Tempered:
Number of specimens: 9.
Method of manufacture: coiled.
Texture: medium.
Color: exterior, buff-gray; interior, gray, orange-gray; core, gray.
Surface finish: smoothed.
Wall thickness: 5.5 mm. to 7 mm., average 6.5 mm.
Vessel form: no information. 
Distribution: (Table 4).

Clay Tempered Non-Lower Valley Ware:
- Number of specimens: 1.
- Method of manufacture: coiled.
- Texture: laminated, paste medium.
- Color: dark brown throughout.
- Surface finish: smoothed.
- Form: no information.
- Wall thickness: 4.5 mm.
- Distribution: (Table 4).

Marksville Stamped: (Fig. 7, b; Fig. 8 and 9).
- Number of specimens: 4 (2 vessels represented).
- Method of manufacture: coiled.
- Temper: clay.
- Texture: medium.
- Color: gray throughout.
- Surface finish: smoothed, burnished.
- Wall thickness: (3 specimens) 4.5 mm. to 5.5 mm., average 5.1 mm.
- Lip: (2 specimens) 3.5 mm. and 5 mm. Rim diameter, 6 cm. and 8 cm.
- Base: no information.
- Vessel shape and size: one vessel cylindrical, slightly outward flaring; second, similar to complete Marksville Stamped vessel found in mound.
- Distribution: (Table 4).
- Comments: Two of the sherds in this group appear to be fragments of the same vessel found by McClurkan; however, they do not fit onto the sherds found by him. The remaining two sherds represent another vessel: the rim and neck treatment are typically Marksville with broad, horizontal line incising at the neck and incisions within this line, but rocker stamping is absent.

Lake Borgne Incised: (Fig. 7, a and d).
- Number of specimens: 4.
- Method of manufacture: coiled.
- Temper: clay and small amount of sand.
- Texture: paste laminated and medium.
- Color: buff interior and exterior; core gray.
- Surface finish: smoothed and decorated.
- Wall thickness: 6.5 mm. to 8 mm., average 7.9 mm.
Lip: (1 example) incurvate, rounded and decorated with typical Lake Borgne drag and jabbed lines.
Base: no information.
Vessel shape and size: no information.
Decoration: series of horizontal and diagonal drag and jabbed incisions.
Distribution: (Table 4).
Marksville Plain: (Fig. 7, h).
Number of specimens: 1.
Method of manufacture: coiled.
Texture: medium.
Temper: in clay.
Color: red-orange with gray-buff fire clouds.
Surface finish: smoothed.
Form: neckless olla.
Wall thickness: 4 mm.
Rim: excursive and incised.
Lip: squared.
Base: rounded.
Comments: The rim diameter on this complete specimen is 6.5 cm., the body diameter is 8 cm., and the entire height is 5.5 cm.
Distribution: Feature 9.

COPPER

Twenty-two copper objects were recovered during excavations at
Coral Snake Mound (Tables 5 and 6). The sample contains 19 copper beads, one copper pendant, one copper earspool, and one copper fragment.

Beads

The copper beads are of the rolled, tubular variety. Most of the beads are square or rectangular in cross section, suggesting that they were beaten out on a mandril (Fig. 10, c). The round or oval specimens (Beads 13, 17, 18 and 19) have irregular holes, suggesting that they were molded around soft material which was later forced out. Preservation of the beads varies from thin patination to complete oxidation. Beads 1 and 2 were fused by oxidation. Oxidation preserved twine inside Beads 3, 4, 5, 6, 7, 8 and 17 (Fig. 10, g). Beads 5 through 8 were found in a row and may have been part of a bracelet. Bead 17, the largest bead found, (Fig. 10, b) weighs 44 grams.
Earspool (Fig. 10, a)

Number of specimens: 1.

Dimensions: Large disc, 29 mm. in diameter; small disc, 25 mm. in diameter; total thickness, 14 mm.; inside diameter, 3 mm.

Description: This is a small, heavy, yo-yo shaped, perforated earspool (Table 6).
TABLE 5
Dimensions of cooper beads from Coral Snake Mound

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Inside diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bead 1</td>
<td>9 mm.</td>
<td>8.5 mm.</td>
<td>2 mm.</td>
</tr>
<tr>
<td>Bead 2</td>
<td>4 mm.</td>
<td>6.5 mm.</td>
<td>1 mm.</td>
</tr>
<tr>
<td>Bead 3</td>
<td>7 mm.</td>
<td>4.0 mm.</td>
<td>2 mm.</td>
</tr>
<tr>
<td>Bead 4</td>
<td>6 mm.</td>
<td>4.5 mm.</td>
<td>1 mm.</td>
</tr>
<tr>
<td>Bead 5</td>
<td>12 mm.</td>
<td>7.0 mm.</td>
<td>4 mm.</td>
</tr>
<tr>
<td>Bead 6</td>
<td>9 mm.</td>
<td>6.5 mm.</td>
<td>4 mm.</td>
</tr>
<tr>
<td>Bead 7</td>
<td>8 mm.</td>
<td>8.0 mm.</td>
<td>3 mm.</td>
</tr>
<tr>
<td>Bead 8</td>
<td>11 mm.</td>
<td>6.5 mm.</td>
<td>4 mm.</td>
</tr>
<tr>
<td>Bead 9</td>
<td>18 mm.</td>
<td>7.0 mm.</td>
<td>4 mm.</td>
</tr>
<tr>
<td>Bead 10</td>
<td>12 mm.</td>
<td>5.0 mm.</td>
<td>3 mm.</td>
</tr>
<tr>
<td>Bead 11</td>
<td>11 mm.</td>
<td>4.0 mm.</td>
<td>2 mm.</td>
</tr>
<tr>
<td>Bead 12</td>
<td>7 mm.</td>
<td>4.5 mm.</td>
<td>2.5 mm.</td>
</tr>
<tr>
<td>Bead 13</td>
<td>22 mm.</td>
<td>6.0 mm.</td>
<td>4 mm.</td>
</tr>
<tr>
<td>Bead 14</td>
<td>11 mm.</td>
<td>5.0 mm.</td>
<td>2 mm.</td>
</tr>
<tr>
<td>Bead 15</td>
<td>9 mm.</td>
<td>6.0 mm.</td>
<td>2.5 mm.</td>
</tr>
<tr>
<td>Bead 16</td>
<td>7 mm.</td>
<td>5.0 mm.</td>
<td>2 mm.</td>
</tr>
<tr>
<td>Bead 17</td>
<td>30 mm.</td>
<td>27.5 mm.</td>
<td>8 mm.</td>
</tr>
<tr>
<td>Bead 18</td>
<td>17 mm.</td>
<td>18.5 mm.</td>
<td>9 mm.</td>
</tr>
<tr>
<td>Bead 19</td>
<td>5 mm.</td>
<td>7.0 mm.</td>
<td>3 mm.</td>
</tr>
</tbody>
</table>

Pendant (Fig. 10, f)
Number of Specimens: 1.
Dimensions: Length, 125 mm.; width at top, 55 mm.; width at base, 72 mm. One hole has a diameter of 7 mm., while the other is oval and

TABLE 6
Distribution of copper artifacts at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Type</th>
<th>Horizontal location</th>
<th>Vertical location (feet)</th>
<th>Stage</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bead-1</td>
<td>N496 E502</td>
<td>96.5</td>
<td>2</td>
<td>...</td>
</tr>
<tr>
<td>Bead-4 (2)</td>
<td>N495.5 E502</td>
<td>95.7</td>
<td>2</td>
<td>...</td>
</tr>
<tr>
<td>Beads (4)</td>
<td>N496.1 E509.1</td>
<td>98.6</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Beads (3)</td>
<td>N484 E502</td>
<td>97.5</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>Bead</td>
<td>N493.2 E502</td>
<td>98.1</td>
<td>2–3</td>
<td>34</td>
</tr>
<tr>
<td>Bead</td>
<td>N483.5 E501.1</td>
<td>98.9</td>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>Beads (3)</td>
<td>N496 E501.5</td>
<td>95.2</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Bead-18</td>
<td>N514 E489</td>
<td>99.1</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Earspool</td>
<td>N494 E504</td>
<td>96.3</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>Pendant</td>
<td>N496.7 E500.5</td>
<td>95.81</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Bead</td>
<td>Mound fill</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Bead</td>
<td>Backdirt</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Copper fragment</td>
<td>Backdirt</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
11 mm. by 14 mm. (copper disease has probably altered the original size of the perforation).

Description: The pendant has no apparent engraving but was beaten together from copper nuggets. Some skin fragments are still adhering to its underside (Table 6).

Large Rolled Cooper Bead (Fig. 10, b)
A rather large bead, this specimen (Number 18) was rolled from a long strip of copper. The bead is 17 mm. long, 18.5 mm. wide, and has an inside diameter of 9 mm. (Table 6).

Copper Fragment

Dimensions: Length, 24 mm.; width, 18 mm.; thickness, 0.6 mm.; diameter of perforation, 2 mm.

Description: This is a small, perforated copper pendant or gorget fragment. The original shape or size is not ascertainable (Table 6).

Remarks: A fragment of this specimen was sent to the Argonne National Laboratory for trace element analysis, in an attempt to determine the origin of this copper. Results were inconclusive.

GLASS

Beads (Fig. 10, d and e)
Number of Specimens: 2.

Description: Both of these specimens represent Type 61 described by Harris and Harris (1967: 145) as small, dark blue, translucent, tube-shaped, simple beads that were tumbled. Bead Type 61 falls into Harris’ (1967: 156) Period 2 between 1740 and 1767.

DISCUSSION

Excavations at Coral Snake Mound during 1966–1967 clarified the origin and nature of the mound. Archeological features, for the most part, are associated with either the second or third mound construction stage. The first stage consisted of excavating a central basin only. The second stage or refilling of this basin has inclusive material, as does the cap or mound Stage 3.

A potential problem arises in separating the deliberate from the accidental inclusions of cultural material in the mound. Some basic assumptions must be made concerning this; the nature and source of fill for the mound construction, as well as what might be expected in this fill, are of major importance. A moat-like borrow pit encircled most of the mound; this excavation may have had sufficient fill to account for Stage 2 construction, but not for Stage 3. No other borrow
pits were found near the mound, and tests in the vicinity suggested that no cultural material was present in the mound area before it was constructed. Yet we have apparent random inclusions of potsherds, dart points, debris and debitage, materials normally expected in a midden deposit.

Burials with offerings, cremations, large ceremonial points, copper ornaments and ceramic vessels are not usually part of midden debris. Such items are considered to be purposeful inclusions into the mound, and their placement with relation to building stages bears this out to some extent. On the other hand, the flint debris, isolated sherds and projectile points reflect accidental inclusion into the mound fill and their relative lack of distributional patterning bears this out to a great extent.

With the exception of the two glass trade beads found deep in the center of the mound, the remaining materials are prehistoric, and either contemporaneous with or predate construction of the mound.

The distribution of various features illustrates several trends at the site (Tables 7–11). Most of the artifact caches are concentrated in the outer mound cap. Five additional caches found by McClurkan were associated with this stage. The two ochre concentrations were associated with the contact zone between Stages 2 and 3, and probably were placed upon the surface of the primary mound as offerings before it was covered up.

The fire basins (Table 8) are associated with the second stage of construction, and the single fire basin found by McClurkan in 1965 appears to have been associated with Stage 3.

The burials at Coral Snake Mound (Table 9) are single or multiple secondary types. Ten of these were interred during Stage 2, and two are associated with Stage 3. The bone concentrations reported by McClurkan apparently were associated with the latter stage.

Twenty-seven of twenty-nine cremations (Table 10) were found in the Stage 2 fill of the mound. Few, if any, are in situ cremations, but are secondary interments of burned bone. The large cremations found well within the central basin, Features 54, 57 and 60, all appeared to be in situ cremations. One cremation was found in the Stage 3 level of the mound, and one was situated at the contact between Stages 2 and 3.

Isolated dart points, knives and potsherds were distributed in equal quantities between Stages 2 and 3 (Table 11). Lithic artifacts were concentrated in the Stage 2 fill with the ceramic debris clustering in the Stage 3 portion, possibly indicating an interval between the completion of Stage 2 and the construction of Stage 3, or that borrow for the mound came from two different locales, one an essentially non-
TABLE 7

Distribution and description of caches at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Feature number</th>
<th>Location and elevation</th>
<th>Description, size, and shape</th>
<th>Material</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>N514.2-E489; 99.1</td>
<td>Irregular, red ochre-stained area 57 cm. NW-SE × 30 cm. EW; no pit outline but sand around artifacts stained brown</td>
<td>Rolled copper bead, small Marksville Plain vessel, copper stained human tooth.</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>N503-E489; 98.6</td>
<td>Large, oval, shallow red ochre-stained area, 45 cm. EW × 60 cm. NS, some 1.5 cm. to 2.0 cm. deep. Probably represents base of McClurkan’s Cache 3.</td>
<td>Copper stained human tooth.</td>
<td>2–3</td>
</tr>
<tr>
<td>16</td>
<td>N496.8-E500.5; 95.9</td>
<td>Cluster of material with no definite outline; skin impression and rib fragments indicate burial.</td>
<td>Trapezoidal copper pendant, Marksville Stamped vessel.</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>N494-E505.9; 99.0–99.4</td>
<td>Cluster of material with no outline present. Possible burial.</td>
<td>2 points of gray Duck River (?) chert; skull fragments, mandible, charred bone fragments.</td>
<td>3</td>
</tr>
<tr>
<td>31</td>
<td>N483.5-E501.1; 98.9</td>
<td>Oval, red ochre-stained brown sand area, ca. 10 cm. thick, 45 cm. NS × 30 cm. EW.</td>
<td>Copper bead, point.</td>
<td>3</td>
</tr>
<tr>
<td>32</td>
<td>N496.1-E509.1; 98.6</td>
<td>Cluster of material lying on yellow sand.</td>
<td>4 cylindrical copper beads.</td>
<td>3</td>
</tr>
<tr>
<td>35</td>
<td>N482.5-N483.8, E502.6-E505.9; 97.6 ft.</td>
<td>Irregular shaped concentration of red ochre.</td>
<td>Two chert flakes.</td>
<td>2–3</td>
</tr>
<tr>
<td>37</td>
<td>N483.2-N486, E509.4-E510.6; 96.8 ft.</td>
<td>Large, oval concentration of red ochre.</td>
<td>Human teeth.</td>
<td>2–3</td>
</tr>
<tr>
<td>44</td>
<td>N494-E504; 96.3 ft.</td>
<td>Isolated find.</td>
<td>One copper earspool.</td>
<td>2</td>
</tr>
</tbody>
</table>

Ceramic area and the other from a ceramic bearing area. The distribution of lithic artifacts does not resolve this problem, since Gary, Kent and Palmillas points are not divisible into discrete time categories as yet, and are all generally classified as Late Archaic in East Texas.

The distribution of ceramics is more suggestive of a time differential between Stages 2 and 3. Stage 2 ceramics include one Lake Borgne Incised sherd, one Marksville Stamped sherd, two sherds with a laminated paste (probably Tchefuncte Plain), and two sand tempered
TABLE 8
Distribution and description of fire basins at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Feature number</th>
<th>Location and elevation</th>
<th>Description, size, and shape of feature</th>
<th>Material</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>N503.5—E497; 92.2</td>
<td>Deep circular fire basin, ca. 55 cm. diameter, 12 cm. deep; lenticular cross section. Fill—mottled gray-black sand with flecks of charcoal.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>45</td>
<td>N498—E489; 94.3</td>
<td>Circular fire basin, 78 cm. diameter, 20 cm. deep. Fill—gray-black sand with flecks of charcoal.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>61</td>
<td>N495—E500; 91.9</td>
<td>Circular basin, 62 cm. diameter, 30 cm. deep. Fill—dark gray-black sand and burned bone. Feature 57, a cremation directly above and the probable source of bones.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>62</td>
<td>N491—E481; 94.1</td>
<td>Oval basin, 75 cm. NW-SE, 45 cm. SW-NE, 30 cm. deep. Fill—gray-black sand with charcoal flecks.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>63</td>
<td>N497.5—E512.5; 92.1</td>
<td>Circular basin, 75 cm. diameter, 30 cm. deep. Fill—gray-black sand, burned bone, small sandstone cobbles.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>64</td>
<td>N496—E504; 91.8</td>
<td>Circular basin, 60 cm. diameter, 30 cm. deep. Fill—gray-black sand, burned bone, sandstone fragments.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>65</td>
<td>N488—E495.5; 93.6</td>
<td>Circular shape, 75 cm. diameter, 45 cm. deep. Fill—gray-black sand, burned bone.</td>
<td>Dart point fragment</td>
<td>2</td>
</tr>
<tr>
<td>66</td>
<td>N486—E495; 93.6</td>
<td>Circular basin, 60 cm. diameter, 30 cm. deep. 60 cm. north of Feature 65.</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>67</td>
<td>N505—E494; 92.8</td>
<td>Circular shape, 60 cm. diameter, 30 cm. deep. Fill—gray-black sand.</td>
<td>None</td>
<td>2</td>
</tr>
</tbody>
</table>

Sherds. These ceramics indicate a Marksville or pre-Marksville borrow pit area. An alternate possibility is that Lake Borgne Incised and Tchefuncte Plain types were still in use during Marksville times.

Ceramics from the Stage 3 construction of the mound include bone tempered ware, sand tempered ware, grog tempered ware, clay tempered ware, grog and bone tempered ware, bone and sand tempered
### TABLE 9

Distribution and description of burials at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Feature number</th>
<th>Location and elevation</th>
<th>Description, size, and shape of feature</th>
<th>Material</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 N492.4-E499; 97.9</td>
<td>Bone concentration including mandible and longbone fragments, placed in shallow oval pit dug into tan sand layer. Fill of brown sand.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>13 N507.5-E502; 95.6</td>
<td>Concentration of bone 45 cm. NS, 30 cm. EW. In tan sand layer. Several bones burned partially. Probable multiple bundle burial.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>14 N500.0-E500.5; 94.9</td>
<td>Multiple bundle burial, with several crushed skulls and longbones placed in shallow circular basin, 75 cm. diameter, 15 cm. deep, and covered with sand, pit dug into tan sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>23 N502-E498.5; 94.6</td>
<td>Bone concentration 45 cm. EW, 32 cm. NS; 5 cm. deep on brown stained sand. Probable bundle burial.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>24 N506.7-E502; 94.8</td>
<td>Bone concentration in matrix of sand, 20 cm. NS, 32 cm. EW.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>27 N494-E514; 100.1</td>
<td>Concentration of bones 60 cm. SE-NW, 18 cm. SW-NE, 18 cm. deep, in tan sand fill. Probable bundle burial.</td>
<td>None</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>33 N495-E506.8; 98.5</td>
<td>Bundle burial with 4 longbones, charred skull fragments in brown sand fill.</td>
<td>None</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>39 N495-E500; 96.2</td>
<td>Bundle burial with longbone and skull fragments in tan fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>41 N498-E503; 96.2</td>
<td>Isolated copper stained skull fragment.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>46 N499-E500; 95.1</td>
<td>Bundle burial of longbones placed in pit 30 cm. diameter, 15 cm. deep and covered with brown sand.</td>
<td>Fragmentary biface of novaculite</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>51 N491-E501.5; 95.4</td>
<td>Isolated fragmentary skull in brown sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>52 N496-E501.5; 95.2</td>
<td>Bone concentration 21 cm. diameter, 15 cm. deep in brown sand fill.</td>
<td>Copper beads</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 10

Distribution and description of cremations at the Coral Snake Mound

<table>
<thead>
<tr>
<th>Feature number</th>
<th>Location and elevation</th>
<th>Description, size, and shape of feature</th>
<th>Material</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 N487.5–E496.5; 96.6</td>
<td>Concentration burned bone, 11 cm. diameter, 3 cm. deep; no pit outline but lenticular cross section. Fill—brown sand.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>15 N504–E491; 95.6</td>
<td>Oval pit 50 cm. EW, 30 cm. NS, 8 cm. deep, lenticular cross section. Brown sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>17 N496–E499; 95.6</td>
<td>Concentration of burned bone 15 cm. diameter, 30 cm. deep in tan sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>18 N500.5–E500.5; 94.9</td>
<td>Cluster of burned bone 15 cm. diameter, 15 cm. deep in tan sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>19 N495–E500.5; 94.9</td>
<td>Concentration of burned bone 15 cm. diameter, 3 cm. deep. Cluster of burned bone, destroyed by cave-in.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>20 N494–E500; 96.1</td>
<td>Burned bone cluster destroyed by cave-in.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>21 N495.5–E497; 94.2</td>
<td>Possible pit cremation with burned bones lying over red ochre stain.</td>
<td>3 Gary points, 2 of which were burned</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>22 N492–E490.5; 94.8</td>
<td>Concentration of burned bone 12 cm. diameter, 3 cm. thick. Cluster of burned bone 12 cm. diameter, 10 cm. thick. Localized area of burned bone 12 cm. diameter, 12 cm. thick. Concentration of burned bone, 15 cm. diameter, 15 cm. deep. Fill of brown and green stained sand. Basin shaped concentration of burned bone 30 cm. diameter, 15 cm. thick. Circular cluster of burned bone 30 cm. diameter, 15 cm. thick. Concentration of burned bone 30 cm. diameter, 15 cm. thick. Some 15 cm. below Feature 39. Circular cluster of bone 15 cm. diameter, 15 cm. thick with brown sand fill and flecks of Petrified wood flake</td>
<td>Copper bead above bones</td>
<td>2–3</td>
<td></td>
</tr>
<tr>
<td>25 N501–E499; 93.8</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>26 N501–E501; 93.6</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>28 N502.5–E502; 93.1</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>34 N493.2–E502; 98.1</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>36 N496–E519; 97.5</td>
<td>None</td>
<td>None</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>38 N492–E502.5; 96.5</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>40 N495–E500; 95.6</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>42 N496–E501; 95.8</td>
<td>None</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Feature number</td>
<td>Location and elevation</td>
<td>Description, size, and shape of feature</td>
<td>Material</td>
<td>Stage</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------</td>
<td>----------------------------------------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>43 N492.5–E502.5; 94.6</td>
<td>Circular concentration of burned bone, 15 cm. diameter, 15 cm. thick in brown stained sand.</td>
<td>charcoal. Possible in situ cremation.</td>
<td>1 chert flake</td>
<td>2</td>
</tr>
<tr>
<td>47 N498–E501; 94.3</td>
<td>Concentration of bone 15 cm. diameter, 15 cm. deep in brown sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>48 N495–E499.5; 94.3</td>
<td>Circular cluster of burned bone 15 cm. diameter, 15 cm. thick.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>49 N492.5–E505; 95.1</td>
<td>Localized concentration of bone 15 cm. diameter, 15 cm. thick.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>50 N510–E492.5; 94.8</td>
<td>Circular concentration of burned bone 30 cm. diameter, 20 cm. thick.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>53 N496–E505; 94.5</td>
<td>Oval cluster of bone 60 cm. ( \text{NS, 45 cm. EW, 18 cm. thick in brown sand fill.} )</td>
<td>4 chert flakes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>54 N492.5–E500; 93.8</td>
<td>Oval concentration of bone 45 cm. NS, 30 cm. EW, 15 cm. thick in brown stained fill.</td>
<td>1 Gary point, 4 chert flakes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>55 N492–E508; 95.7</td>
<td>Circular cluster of bone 15 cm. diameter, 15 cm. thick in brown stained sand.</td>
<td>6 chert flakes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>56 N492–E503; 93.6</td>
<td>Circular bone concentration, 15 cm. diameter, 8 cm. thick in brown stained fill.</td>
<td>1 dart point tip</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>57 N491.5–E500; 93.9</td>
<td>Circular cluster of bone, 45 cm. diameter, 45 cm. thick, fill of brown stained sand and flecks of charcoal. Possible in situ cremation.</td>
<td>2 chert flakes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>58 N499–E498.5; 93.6</td>
<td>Concentration of burned bone 15 cm. diameter, 15 cm. thick in brown and gray stained sand.</td>
<td>1 sandstone rock, 1 chert flake</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>59 N499–E499; 93.4</td>
<td>Circular cluster of bone 15 cm. diameter, 15 cm. thick in brown sand fill.</td>
<td>None</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>60 N499–E501; 93.9</td>
<td>Oval cluster of bone 60 cm. ( \text{NS, 30 cm. EW, 15 cm. thick in brown sand fill.} )</td>
<td>1 chert flake</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
and grog and sand tempered wares (Table 4). The presence of temper types which are considered “Caddoan” poses another problem. Either Caddoan-like pottery is earlier than suspected, or the third stage of Coral Snake Mound is considerably later than the preceding one. The fact that extensive surveys and tests failed to reveal a Marksville occupation lessens the probability of a time differential between Stages 2 and 3. It is possible that these unexpected sherds represent late intrusions into the mound. The adjacent site (X16SA1) is a late Caddoan Site probably dating just before the Historic Period. An intensive surface search of the Coral Snake Mound before the first season’s work yielded no late material. The upper part of the mound was culturally sterile. The absence of surface sherds and material in the upper one-third of the mound fill suggests that the Caddoan-like material predates the mound and was part of the fill in the borrow pit area.

Radiocarbon dates for the mound shed some light on the building stages represented. We find the three most recent dates (TX-442, 443, 444) (Valastro, Davis, Rightmire, In Press) compatible with the previous dating done for McClurkan (Pearson, Davis, Tamers, 1966: 462–465).

### Radiocarbon Dates for Coral Snake Mound

<table>
<thead>
<tr>
<th>Specimen Number</th>
<th>Elevation</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX-265</td>
<td>100.57 feet</td>
<td>AD 300 ± 90</td>
</tr>
<tr>
<td>TX-244</td>
<td>100.50 feet</td>
<td>AD 1740 ± 90</td>
</tr>
<tr>
<td>TX-433</td>
<td>98 feet</td>
<td>AD 180 ± 80</td>
</tr>
<tr>
<td>TX-442</td>
<td>95.75 feet</td>
<td>20 BC ± 100</td>
</tr>
<tr>
<td>TX-444</td>
<td>94.3 to 93.5 feet</td>
<td>1260 BC ± 210</td>
</tr>
</tbody>
</table>
Generally, the above dates would suggest that the mound was built in stages—over a period of time. Sample TX-265 reflects a not-too-unreasonable “outside” date for terminal Marksville. Sample TX-244 is obviously not associated with a Marksville building stage of the mound, but rather with a later, perhaps historical, intrusion into the mound.

Relationships between the Coral Snake Mound builders and other areas are apparently somewhat diverse. The Marksville Plain vessel found in Feature 9 appears to be a trade item from the Lower Mississippi Valley; similarly, the Tchefuncte Plain and Lake Borgne Incised sherds appear to be imported. The Marksville Stamped vessel and several Marksville Stamped sherds, on the other hand, may have been locally made, as the paste, temper, and surface characteristics differ from the central and southern Louisiana materials. Explanations for this would include Marksville women marrying into northwestern Louisiana or perhaps the diffusion of ideas along with the trade of imported items mentioned above. Since the Marksville Stamped vessel was associated with datable carbon (TX-442) and the date of 20 BC is compatible with fullblown Lower Valley Marksville cultural expression, either explanation could be possible. The Caddoan sherds from the Stage 3 portion of the mound are also locally made.

Two of the large ceremonial points were made of gray chert lithologically similar to Duck River material in western Tennessee. Twenty flakes of this gray chert were found in the mound fill, and these specimens primarily represent biface thinning or *eclat de taille* flakes, a by-product of the manufacture of thin bifaces. The presence of this material suggests that blanks or preforms were brought into the area. The finished products being manufactured locally. Four pink-white novaculite *eclat de taille* flakes and a dart point fragment show that novaculite was also imported. Two pieces of oolitic chert, a dolomite flake and dart point fragment, further suggest the use of non-local materials. The nearest known source of dolomite and oolitic chert is the Arbuckle Mountains in Oklahoma.

There is considerable evidence for trade between the Toledo Bend area and other areas. This trade appears to have been of a rather selective nature; the presence of Lower Valley sherds in a Lower Valley burial mound is expected. The presence of Lower Valley design elements on local clays and tempers implies more than trade, i.e., an exchange of people and/or ideas. The non-local lithic materials—Duck River flint, novaculite, oolitic chert and dolomite were probably sought after because they could be made into larger implements. The local river pebbles (chert) average under 10-15 centimeters in length,
thereby precluding the manufacture of large ceremonial or burial points.

Copper is not native to the Sabine River drainage; possible sources for the Coral Snake copper could be northern Georgia or the Upper Great Lakes Region. It is impossible to determine the origin of copper ornaments from the mound until native copper trace element studies are completed. A neutron activation analysis of two copper samples, one from Coral Snake Mound and one from Jonas Short Mound, was run by Dr. Richard W. Ramette, then of Argonne National Laboratory:

"Sample X16SA48 (Louisiana) showed a silver concentration of 290 parts per million, and a mercury concentration of 9.4 ppm.

"Sample 41SA101 (Texas) was: silver, 300 ppm, mercury, 16 ppm.

"Thus, the two samples do not differ much from each other, and they are about what we would expect for native copper in this country. We have not been able to devise, as previously hoped, a procedure for tracing copper back to its source. Not enough elements show up in activation analysis."

Trade beads from a deep pothole at the center of the mound suggest some antiquity for the disturbance. At the adjacent site (X16SA1), an early historical artifact was found during excavations; the piece is a cast brass French trigger guard finial, which may date to the early or middle eighteenth century. The trigger guard was found 30 meters due east of the mound about 1 meter below the surface. Both the beads and trigger guard appear to represent French trade. One Carbon 14 date (TX-244) of AD 1740 from the mound agrees with the estimated age of the historical artifacts recovered (Pearson, Davis, Tamers, 1966: 462). The relationship between the material dated and the historical artifacts is unclear.

There is, unfortunately, little comparative data concerning the Marksville problem, especially from the Caddoan area. The Jonas Short Mound reported by Jeiks (1965) includes the greatest amount of comparative material for the area. Similarities between the Jonas Short and Coral Snake mounds include: subfloor pits with in situ cremations, two subsequent mound building stages above the pit, borrow pits encircling the mounds, caches of artifacts including large ceremonial points, copper ornaments, perforated teeth and boat stones. Jonas Short lacks: prepared fire hearths, isolated secondary cremations, non-cremated burials, ochre concentrations and ochre with caches, and Marksville pottery. While there are many parallels between the two mounds, there appear to be equally as many differences, suggesting their construction by perhaps related, but not sanguinal, groups.
The Bellevue Mound reported by Fulton and Webb (1955) is also an early site with Lower Mississippi Valley affiliations. The mound had a shallow subfloor basin on a prepared clay platform containing a flexed adult burial. Two fragmentary cremations were found near the center of the mound. Although no grave furniture accompanied the burials, lithic and ceramic artifacts were found in the mound fill. Only one identifiable sherd was found, a Churupa Punctated specimen. This, together with paste and temper characteristics of the remaining sherds, suggested a Marksville affiliation for the mound. It might be further noted that 14 of the 752 sherds found during excavations were bone tempered.

The Crooks Site reported by Ford and Willey (1940) is the only remaining well-documented Marksville period burial mound. Similarities between the Crooks Site and the others described above, especially Jonas Short and Coral Snake, are as follows: the mound was built in three stages, had an encircling moat-like borrow pit, burials were scattered throughout the mound, fire hearths or evidence of fire was present, grave furniture, including pottery vessels, was present, ground stone artifacts, ochre and copper offerings were present. One notable absence is the apparent lack of cremations at the Crooks Site (they were present in the other three sites). The Crooks Site is located in central Louisiana in what might be termed the Marksville "heartland." So, while there are qualitative differences between these mounds, the similarities are obvious.

It appears that the Jonas Short, Bellevue and Coral Snake Mounds are all Marksville affiliates. Moreover, as these sites are peripheral or marginal to the Marksville heartland, they reflect local, as well as Marksvillian ceremonial traits. Of particular import are the bone tempered sherds at Bellevue and the Caddoan appearing sherds at Coral Snake. These sherds, while not assignable as yet to either the Gibson or Fulton Aspects, or even a fullblown Caddoan ceramic tradition, are more definitely Caddoan than Lower Mississippi Valley. Whether these Caddo-like sherds represent pre-Caddoan, proto-Caddoan or incipient Caddoan is a moot question. The reality of the situation is that bone tempered and otherwise Caddoan-like sherds are present in artificial earth works generally considered to predate anything Caddoan by at least five hundred years. The earlier Caddoan sites—Gahagan, Spiro, Crenshaw, and Davis—didn't come into being overnight. They probably developed and changed as rapidly as Fulton developed from Gibson or over about five hundred years. We are not trying to suggest that the Caddoan tradition developed out of Marksville, but rather that Marksville may have been the impetus or catalyst
to a number of incipient local early pottery makers that developed into Caddos, i.e., Marksville plus local pottery wares equals early Caddoan wares.

CONCLUSIONS

Coral Snake Mound is a component of the Marksville culture outside what might be considered its heartland or area of expected influence. The mound had three distinct building stages. Stage one is represented by the excavation of a subfloor pit in which several cremations were prepared. Stage two includes the filling of this pit and the building of a small, circular mound above the spot. Stage three is represented by a cap which covered the primary or stage two portion.

Certain types of features were essentially unique to either the primary mound or mound cap. Caches were for the most part associated with the mound cap, ochre concentrations between the primary mound and the cap, fire basins with the primary mound, as were burials and cremations. Points, knives and stone debris were fairly equally distributed between the two construction phases. Only Lower Mississippi Valley sherds and sand tempered sherds were found in the primary mound, while these and numerous Caddoan sherds were found in the mound cap.

The presence of equal arm cross design elements is not completely unknown in Marksville and affiliated Hopewell pottery (Griffin, personal communication), but they are indeed rare. The association of a locally made Marksville Stamped vessel with this design element and the Caddoan sherds poses new problems. The presence of Caddoan sherds in a peripheral Marksville mound indicates the need for further revision of the Lower Mississippi Valley and Caddoan area sequences. It would appear from this new evidence that alignment of Alto I with Marksville-Hopewell by Newell and Krieger (1949: Fig. 66) was correct.

We argue for consideration of this alignment because of the following reasons. Caddoan-like sherds were well within the mound cap or Stage 3 portion of the mound, and were at a minimum of three feet below the surface of the mound. McClurkan’s AD 300 (TX-265) is compatible as to the building stage and elevation, with many Caddoan-like sherds found within the mound. Coral Snake Mound is a mixture of local and foreign ideas—it is not pure Marksville, nor is it pure Sabine River-Toledo Bend. The mound site itself seems to have been the focus of human activity for a long period of time, since we have Archaic, Marksville and Historic use of the same site. The mound cap may well represent a “last gasp” of Marksville-inspired veneration of
the dead by descendants of the mound’s builders who, by that time, had accepted, invented or evaluated a ceramic-making tradition now known as Caddoan.

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Texas Archaeological Salvage
Southern Methodist University
The Acton Site:
Hood County, Texas

JAY C. BLAINE, R. K. HARRIS,
WILSON W. CROOK, JR. AND JOEL L. SHINER

ABSTRACT
Typological and technological studies of a large systematic collection of flaked and ground stone artifacts indicate a considerable occupation of the Acton Site during a transition period from late Paleo-Indian stage to early Archaic stage. For the first time, all of the materials from this type of site are described according to a standard system.

INTRODUCTION
Investigation of this site was undertaken by the senior author and his wife in the spring of 1961. Initial collection was selective and confined to surface artifacts. By 1962 it became apparent that an unusually high percentage (approximately 50%) of the dart points being found were those generally held to be representative of the Paleo-Indian stage in Texas. In addition, tool forms, cores and flakes were present in quantities potentially useful for detailed study. In the hope of eventually affilating some of this material with the Paleo-Indian tools, a complete surface collection procedure was initiated and eventually supplemented by test excavations. This report concerns analysis of materials primarily collected from the surface of the site from 1961 through 1967; the results of limited testing; and geological interpretation and correlations pertinent to this site.

While all of the authors contributed in all phases of this investigation, there are areas in which each assumed primary responsibility. Joel L. Shiner is responsible for the technological analysis of all artifacts, Wilson W. Crook, Jr. for the geological investigation and interpretation, R. K. Harris for the Archaic and Neo-American points, and Jay C. Blaine for the Paleo-Indian points. Linda Harris Brown is the artist responsible for the excellent illustrations of artifacts.

In accordance with the explicit instructions of the land holders only the authors together with Mrs. Jerrylee Blaine and Mrs. Maxine Shiner have worked at the site during the investigation.

The De Cordova Dam is under construction down stream from the site and the development of lakeside property and recreational facilities terminated our investigation of the site.
The authors wish to express their appreciation to the land holders for permission to carry out this study. The assistance in manuscript preparation and typing given by Maxine Shiner, Inus Marie Harris and Jerry Lee Blaine is gratefully noted. Lastly we express our gratitude to J. B. Sollberger of the Dallas Archeological Society for carrying out special flint knapping projects in support of technological study.

THE SITE AND ITS SETTING

The Acton Site is located in east-central Hood County, Texas, on the east side of the Brazos River and near the community of Acton. The exact location is on file with the Department of Anthropology of Southern Methodist University and bears the site designation X41HD-13.

The present channel of the Brazos River is less than 0.5 miles west of the site and a seep spring emerges within 200 yards. The site is situated upon sand-capped low clay ridges slightly protuding from a general land slope which gently descends toward the south.

Most of the artifacts were found in an area about 200 yards long and 160 yards wide and within this area all tools, flakes, cores and cultural debris observed were collected. This area lies within a larger cleared field which has been cultivated for many years. The general site surface is now one of shifting sand through which clay ridges protrude. The generally overlying sand is relatively deep between these ridges or high spots and completely gone or intermixed by plowing with the clay on the ridges.

With only one exception all surface finds of early dart points were made where the plow had penetrated to or into the basic red clay surface. Many of the later types of dart points and other artifacts and debitage were found in the same situation but the latter were also found where some sand cover was present and the underlying clay had not been disturbed by cultivation. There did not appear to be any obvious or significant concentration of artifacts or flakes in any usefully limited area or situation within the site boundaries. In short, the areal distribution of the generally recognized classes of artifacts, including cores, appeared homogeneous for the area studied. Despite the above factors and the fact that the site continued to be under cultivation, the senior author decided to record precise locations for each early point found against such time that test excavations could be carried out. Observations and experiments noted by Fitting et al. (1966: 99) would indicate that most specimens are probably not moved far from their original locations by cultivation or wind action. Subsequently two
compass bearings were secured from each early point location to two widely separated and fixed reference points. The distance between these reference points was measured by tape and formed the basis for map scale. All test excavations and other site detail were similarly mapped.

Test results

Nine test excavations measuring from 3' by 3' up to 6' × 12' were made where sand cover remained over the clay. All tests were located within the artifact bearing area. Standard controls and recording procedures were followed. Excavation was primarily by 6 inch levels and ¼ inch screens were used.

The culture-bearing sand deposit was quite thin in its seemingly undisturbed portion. After factoring out the 6 inch to 8 inch disturbed plow zone the mean thickness of sand deposit for all tests was only 12 inches. Only two reasonably definitive artifacts were found. One, a notched "sinker," was found 2 inches below the plow zone and 14 inches above the clay in test B. The other, a Plainview golondrina basal fragment, was found in test H on the clay at a point 10 inches below the plow zone. Occasional flakes were found in the surface of the clay and down to 5 inches below the surface. There was no evidence observed of sand-filled cracks or fissures involving the latter. There was a tendency for flakes and lithic debris to concentrate in the lower 2 inches of the first 6 inch level above the dense red clay but in the overlying one or two levels, the vertical distribution appeared essentially homogeneous below the plow zone. The intra-level debris counts were not significantly different between the first two to three levels above clay in the tests.

As a general observation it would appear possible that the first significant occupation took place after the clay surface had been reduced by exposure and other factors and a thin derived sand veneer developed. The tests reveal a comparative concentration of lithic debris just above, seldom in or under, the dense red clay. Subsequently the thick sand deposition took place.

An alternative possibly could have the lowest concentration initially on or in the clay surface and freed from this condition by flooding which deposited the major sand layer.

No features were observed in excavation. Occasionally fire-altered rock, flint, and some carbonaceous flecks were found at random depths. Three cultivation scattered groups of fire-altered limestone occurred on the surface of the site.
GEOLOGIC ASSESSMENT OF THE SITE

In the De Cordova Bend Reservoir region, the country bedrock is a rather massive limestone member of the Comanche series of Cretaceous sedimentary origin. Its surface weathers into a rocky, low-grade dark soil (in no manner comparable to the rich blackland prairies to the east derived from the soft Austin Chalk of the Gulf series of the Cretaceous). In nature, this supports live oak on the uplands and in the valleys; on the slopes a tendency to heavy growth of juniper-cedar and sumac; and otherwise native grasses. Cultivation is negligible, grazing being the principal agricultural pursuit, plus some feed grains; there is also a considerable production of cedar fence-posts.

Lying west of the Balcones Fault Zone, whose southwest-northwest trend essentially separates the higher ground of the Cretaceous formations of Texas from the lower and totally different Tertiary formations of the Gulf-Mississippi Embayment, the area is in effect an extension of the Edwards Plateau feature to the northeastward. However, among other things being much more a heavily cedared region, it is by no means identical to the more classic Texas "hill country" another 150 miles southwest. Native flint ledges and nodules occur in varying quality and purity in the limestone, similar but not equal to the high concentration-variety-quality of such in the type Edwards Plateau region. (The later Cretaceous Austin Chalk to the north and east, previously referred to, is notable for its complete lack of flinty materials.)

Topography of the region is purely a result of gentle regional uplift and resultant erosional sculpture . . . primarily since the beginning of the Pleistocene epoch of the Quaternary and due to the work of the Brazos River system with its tributaries, large and small. Differences in elevation are rather impressive, with many mesas and named "mountains" of size, but all are related to the breaks of the master Brazos Valley.

With its headwaters far to the northwest on the High Plains, the Brazos is a through-flowing stream on its way to the Gulf of Mexico, being laden with a brown sandy silt even today throughout all its lower reaches. The material is brought from far upstream, yet everywhere comprises the present floodplain deposits regardless of the local soils and formations through which the river passes.

In the former times of the alternate cut-and-fill cycles, equated with the alternating glacial-stadial-pluvial and interglacial-interstadial-interpluvial periods of the Pleistocene and Recent, as the river progressively trenched its valley ever deeper it left remnants of former floodplains as typical alluvial terraces. These are also composed of exotic
materials, ranging from gravels of harder materials such as cobbles and pebbles of quartzite, flints, petrified wood, petrified Cretaceous molluscs, silicified limestone, and some ironstone-sandstone... all obviously transported at the time of much greater flow and volume than today; thence through a progression of yellow-buff sands, tough yellow-buff clays, red sandy clays, and grey-tan sands. The latter components represent varying degrees of carrying-capacity at the times of deposition.

These sandy and sandy clay soils of the Quaternary alluvial formations support a natural flora quite distinct from the surrounding areas, especially featuring a great variety of oaks other than the live oak, which is absent here. Since the terrace surfaces are so relatively level and so deep in alluvial materials, large areas have been cleared and intensive agriculture practiced—particularly peanuts, peach orchards, and of late the many legumes for hay. Such denuding of the natural cover has allowed in many places extensive wind and water erosion, deflating the loose dry sand surfaces as much as three-to-five feet... piling up sand drifts along fences or against windbreaks of trees... causing erosion channels, gullies, and ravines of surprising development in the apparent period of only the last 60–100 years.

In previous studies (see writer’s pertinent Bibliography, plus others), it has been observed that the Red River, the Sulphur River, the Sabine, the Trinity, the Brazos, the Leon, the Lampasas, and even the Colorado River all more-or-less exhibit the same general northwest-to-southeast pattern of drainage towards the Gulf. Their somewhat parallel courses essentially cross the same series of formations. It is therefore not so surprising that their alluvial terrace systems appear to be quite comparable, even to elevations above stream-grade; when their relative lithologic, paleontologic, and even archeologic contents and inclusions seem to match well at the different levels, the previously suggested “correlations” deserve serious consideration (Slaughter, et al., 1962, pp. 5–11; Crook and Harris 1957, pp. 37–54).

A common phenomenon among the terrace systems of these streams is the difference above-and-below the crossing of the Balcones Fault line. As specific examples, at Dallas on the Trinity to the northeast of De Cordova, Waco on the Brazos downstream, and Austin on the Colorado to the southwest... all at the cut-through of the softer Austin Chalk... there are well-developed 5-terrace sequences apparently dating back to the Early Pleistocene (Slaughter, et al., 1962). These are most suggestive of the 5-terrace sequence of the Red River so carefully studied and described in its middle reaches in Northern Louisiana (Fisk, 1938 and 1940).
On the other hand, above the Balcones line, despite the depth of the Bedrock valley-trench there appears to be only the last or latest two terraces present (or preserved) from the standard sequence. The writer has personally observed this situation upstream on all three major forks of the Trinity; at the Acton Site subject of this paper, at the Possum Kingdom Reservoir, and on the Clear Fork of the Brazos near Abilene even further upstream (Crook, 1955); on the Leon upstream at North Fort Hood; and on the Colorado (and its tributaries, the Llano and San Saba) upstream near Brady and Goolbusk, and near Junction and Menard. Quinn, when paleontologist for the Bureau of Economic Geology for Texas and operating out of Austin, was ever looking for extinct Late Pleistocene fossil bone occurrences; his field of research was more often than not above the fault line to the north and west, and he became so impressed with this almost universal circumstance (though he was only interested in the higher or second terrace where his specimens occurred), that he incorrectly ventured a paper suggesting that ALL Texas river terraces were of Sangamon Interglacial vintage.

Even today, in the confusion over the identification and division of the Late Pleistocene, no one is quite sure about the last “Interglacial” or “major interstadial” . . . but in Quinn’s time, the fauna was attributed to “Sangamon.”

All of which suggests that the major stream-systems were present upon the worn-down Tertiary surface of Texas before the start of the Pleistocene uplift. Their courses were primarily across the vast Coastal Plain, but their head-waters had at least incised across the soft Austin Chalk and were nibbling into the Comanche series. Thus, with rejuvenation by both uplift and increased precipitation, they were able to completely record the progressive levels of cut-and-fill, even through the Austin Chalk; and after perhaps a major cutting-period through most of Pleistocene time across the Comanche series, were only able to retain the Late Pleistocene despositions above the fault line, while gnawing headward to this day into the Permian Basin and High Plains formations.

The Acton archeological site in the De Cordova Bend area is located in precisely such a region on the Brazos above the Balcones line, as discussed above. As impressive as the valley-relief is, only the present floodplain, Recent, and Late Pleistocene alluviations are preserved as terrace remnants. They are however, as high and massive as their counterparts in the complete total sequence downstream at Waco, and almost completely identical as to sequence, lithology, and inclusions.

Further upstream in this vein, the writer’s studies of such High
Plains headwater tributaries as Prairie Dog Fork at Lubbock and Running Water Creek at Plainview... and the creek-like source stream of the Cimarron near Folsom, New Mexico... have found no evidence of any alluviation suggestive of being earlier than the last 10,000 years, or essentially the Recent epoch. While they preserve climatic differences vs. the present, none carries the massive caliche found downstream in terrace formations attributable to the last major non-glacial interpluvial of some 25,000–40,000 years ago, which is so common to deposits of the period; indeed, only at their bases do they include a few terminal species of the Late Pleistocene fauna as fossils, the last members of which seemingly completely disappeared between 10,000 and about 8,000 years ago.

It is within the topmost five feet of the highest terrace at Acton that the archeological site occurs in place. Whether exposed by excavation, erosion, or deflation... the materials appear to be consistently associated with the ancient surface, and perhaps some inches into, of the underlying red sandy clay... and also occur upwards into the basal 18 inches or so of the over-lying tan-gray sands.

Based upon previous correlations, the Acton Site appears to be nearly identical in context with the other river system terrace sequences. The late... Recent... “overlay” of red sandy clay, followed by even later tan-gray sands, on top of the latest sloped-off Pleistocene terrace deposits is standard. The in-place position is precisely the same. Nowhere is there positive evidence of anything but the existing fauna of the last 8,000–10,000 years. And everywhere, including Acton, there is evidence of a naturally-buried Early Archaic human culture at this level; the difference at Acton being only that while it includes all expectable items of comparable types; there is indeed a higher (55%) occurrence of Paleo-type projectile points vs. the usual (5–10%) of same in similar combination and contexts at Dallas and Waco, in precisely the same geologic provenience (Crook and Harris, 1955).

Upon inspection, there is little doubt of the correspondence. A solution is that the upper-middle reaches of the Brazos system were in more direct contact at Acton with the High Plains-oriented Paleo hunters coming downstream into the Early Archaic areas about 8,000–10,000 years ago, along the through-flowing Brazos. Neighboring stream-systems such as the Leon River to the south, or the Trinity to the north, received the High Plains “influence” to a lesser degree, reflecting a much-reduced occurrence of such Paleo points at “contact.” There is only one radiocarbon date available for this period, from the basal 12 inches of the universal overlying tan-gray sands at Woods Pit near Dallas on the Trinity, which falls right at ca. 6,000 years ago.
Therefore, everything else must fall earlier (Crook and Harris, 1961)!

The surface occupation of the red sandy clay must have consumed some extensive period, based upon the debris and many sites on all such related stream systems. Site after site exhibits this same sequence and occurrence. Based upon the Dallas-area Wood Pit date of ca. 6,000 B. P. for the lowest foot of the tan-gray sands (deposited 50–60 feet above present stream-grade), it is not unlikely that the sands represent a warm-dry period of the last high sea level and alluvial deposition connected with the theoretical Hypsi-Alti-Thermal period postulated by various authorities from 6,500–4,500 years ago.

If so, there would be no “problem.”

1. The red clay surface period might easily correspond to the minor Recent glacial readvance recorded as the “Longdraw” in the U. S. Rockies and the type-site Cochrane moraine below James Bay south of the Hudson Bay embayment, already radiocarbon dated at ca. 6,800 B. P. This interruption may well have taken place in the period 7,500–6,500 years ago.

2. Objects left on the red clay surface over an extended period might penetrate into same by human activities such as fire-pit digging, posthole digging, refuse pits, burials, etc.; and by non-human activities such as erosional drop-down, gullies and ravines, root-action, gopher-tunnels, and tree-stumping.

3. Even so, such occurrences must be of an age of ca. 6,500–9,500 years ago.

4. Likewise, the tan-gray sands period of deposition seems to fall in the estimated 6,500–4,500 years ago period (Slaughter, et al., 1962).

5. By known radiocarbon dates, the Late-Paleo “Portales Complex” in adjacent New Mexico is only ca. 6,000 years old (with questionable, undistinguished fauna) . . . a number of the varied “Yuma” Paleo-sites on the High Plains range by radiocarbon dates from ca. 6,500 to 9,500 years ago . . . and by many radiocarbon datings, the “Early Archaic” of the Midwest, Southeast, Mexico, Canada, and elsewhere likewise range up to 11,000 years ago. A possible overlap and “contact” is not at all difficult to imagine.

Acton seems to meet all the requirements to comply with the several possibilities made possible by the above circumstance and its mixture of inclusions. Its geologic provenience is strikingly identical to all other known buried Archaic sites in the alluvial terraces of the Texas rivers.

The Brazos River has been cutting deeply into the Comanche limestone from the De Cordova Bend dam location back upstream past the Acton Site location since at least the inception of Pleistocene time.
The valley impinges against an almost cliff-like wall of same throughout the horseshoe-shaped "bend" ... nearly west below the Acton Site, south-southwest at the tip of the bend, and almost east-southeast at the dam. The tops of the cliffs correspond to the local uplands.

Inside the bend, like a peninsula pointed southward, lies a lower high ground composed of the alluvial terrace sequence described, dropping off in progressive slopes towards the river.

Basically, there is a limestone bedrock channel-cut of about 10–15 feet deep in which the stream presently runs, braided here and there at low water with sand-bars. Above this the floodplain deposits or T-O terrace cap the limestone with about 10 feet of tan-gray sand; this buried limestone surface apparently represents the base-level of the last previous major valley-cut.

Where preserved, there is a T-1 terrace with its surface some 10 feet higher. It is composed of some 5 feet of tan-gray sand on top, with up to 10 feet of red sandy clay beneath where exposures are available. No definite human artifacts have come from this terrace as yet in the Acton investigations, but there are numerous tiny flint flakes upon its surface here and there that are quite suggestive of the typical debris of late Neo-Indian arrowpoint manufacture and in sharp contrast with the heavy rubble and flaked cobble debris of typical Archaic occupations. The surface of the T-1 terraces of all Texas rivers and their similar version of the tan-gray sands normally exhibit such Neo-Indian presence.

Above this is the T-2 terrace, comprising the bulk of the high ground "peninsula" within the bend. At its highest it is approximately 70 feet above present stream-grade, some 40 feet above the T-1 surface. On the slopes, bedrock limestone is exposed for 20–25 feet above the T-1 surface, capped by 15–20 feet of alluvial materials. This outcrop of the bedrock bears numerous seep springs from the groundwater flow penetrating from the broad areas above and then following this resistant formation to the escape point. The seep-level is so constant that willows and cottonwoods are present even at such an altitude above the present river.

It would appear that the top of this limestone exposure represents the level of the next older major valley-cut. The alluviation that followed laid down first a gravel formation as earlier briefly described, of up to 10 feet in thickness, capped by a distinct cemented zone 12–18 inches thick. Where minor gravel operations have been initiated, blocks of this cemented capping have been discarded on all sides. The fragmentary and fossil inclusions of proboscidian tusks (mammoth or
FIGURE 2. Idealized cross-section of the geology at the Acton archeological site. Straight-line connections of the columns indicate present terrace surfaces and slopes; dashed lines illustrate buried Comanche series limestone cuts and relief.
mastodon?), camel, horse, and other bones and teeth leave little doubt of the Late Pleistocene period of provenience . . . in common with almost any other Texas river system T-2 terrace composition. Above this, varying from exposure-to-exposure, especially as more sloped-off towards the valley by subsequent erosion or more fully preserved in the higher parts of the terrace, lie 3 to 5 feet of yellow-buff sand; then 5 to 8 feet of yellow-buff clays including definite caliche nodular concretions; and above this, almost universally a late (actually T-1 age) "veneer" of 3–5 feet of red sandy clay overlain by 3–5 feet of tan-gray sands.

It would seem that the T-1 period of deposition was able to overflow the T-2 terrace surface . . . at least at its maximum flooding period and nearest the river where erosional slope-off was most pronounced . . . before finishing with a deeper deposit below as the T-1 basic fill. This phenomenon is also in common with the other Texas river terrace systems earlier discussed (Crook, 1961). The matrix involved is in all respects identical with the red sandy clay and tan-gray sands below.

At the Acton archeological site itself, test excavations, plus erosion and deflation due to the combined activities of agriculture, land-clearing, and shallow bull-dozing for gravel have produced the following results:

1. In places, the original surface essentially persists; here the tan-gray sands are about 5 feet in thickness; excavations here produce flakes and debris, plus some tools (including one Paleo-Indian type) in the basal 12 to 18 inches of the sands. However, the real concentration of artifacts, plus all expectable Archaic types and many Paleo-Indian projectile points, appear to be concentrated just above the underlying red clay surface and to a slight extent into it. Such a situation is quite comparable to the other Texas terrace systems.

2. Where erosion of wind-deflation has reduced the tan-gray sands cover to the bare red sandy clay surface, or to within a few inches of same, the lowering-action of the sands . . . to join the already known concentration essentially of or on the red clay surface . . . has produced truly massive accumulations. Nonetheless, these are remarkably standard and comparable to the excavated materials, hence no serious questions as to their origin.

3. Where deflation has piled up the surface tan-gray sands against wind-breaks of one kind or another, test excavations have revealed a tan-gray sand thickness of up to nine feet deep above the red clay. Here, the top 4–5 feet have been devoid of debris . . . at such depth, peach seeds and bits of barbed-wire ( rusted) of very recent occurrence
are encountered . . . and below, the original standard sequence as in number 1 above.

In all areas at Acton, modern plow-zone depth in obvious. Where the sands are present, there is a 6–9 inch light-colored, dry zone; where the sands are shallow, or the red clay exposed, there is either a mixed sand-and-clay matrix or there are visible plow-grooves in the surface of the red clay. There are no gopher or mole tunnellings in the tenacious, tough, red sandy clay! (Plenty, in places, in the overlying tan-gray sands where they occur in depth).

**PALEO POINTS**

Typologically speaking 77 of the dart points from the Acton Site exhibit attributes common to Paleo-Indian projectile points. Of this number 50 can be classified as presently recognized types and subtypes in the Plainview, Plainview *golondrina*, Meserve, Angostura and San Patrice categories.

Plainview Points

Some 30 specimens are classified as Plainview and Plainview *golondrina*. This group is primarily composed of basal fragments but includes two complete points and two medial-distal sections of points. All of the bases present are concave. The lateral outlines of these points can be described as essentially parallel-sided with minor variations including slightly expanded midsections and slightly expanded bases, or both. The edges of the distal ends or tips of the specimens are convex.

Although the general classification is based on a sum of attributes, to facilitate description, the Plainview points have been divided into four subgroups or forms, wherein similarities in the lateral outlines of the proximal sections starting at the base are the basis for selective grouping. The variation in proximal form is often very slight but is utilized primarily because basal fragments predominate. This range of variation is recognized within Plainview as described by Krieger (1947: 939–942) and Suhr, Krieger and Jelks (1954: 472). Our particular approach is adapted from that used by Baker, Campbell, and Evans (1957: 3–7) in describing the large series of Plainview points from the Nall site. The four forms are: 1. Points with lateral edges essentially straight and parallel at the base (5 specimens); 2. Points with lateral edges slightly converging for a short distance above the base then becoming straight and parallel (1 specimen); 3. Points with the lateral edges slightly converging above the base then turning outward in a smooth arc (5 specimens); 4. Points with the lateral edges
essentially straight but slightly diverging from the basal corners (10 specimens).

Form 1. (Fig. 3, a and e) One specimen (Fig. 3, a) is complete but quite short. The length-width ratio is less than 2 to 1 and contrasts

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**FigurÉ 3.** a–k, and n, Plainview points; l and m, Plainview-like; o Plainview variant.
with the 3 or 4 to 1 ratio reported for the type site specimens (Krieger, 1947: 942). Examination of secondary flaking and longitudinal section makes it probable this specimen has been re-pointed. All specimens are smoothed in the basal concavity and on the lateral edges. One specimen also shows double lateral-medial basal facets (Epstein, 1963b: 189). The mean basal concavity depth is 3 mm. (range 1–5 mm.). (Approximate measurements are made where damage is light.) Mean basal width is 21 mm. (range 20–23 mm.). Mean maximum thickness is 7 mm. on two specimens. Length of the repointed specimen (Fig. 3, a) is 40 mm.

Form 2. Form 2 points are slightly expanded at the base. There is one specimen (Fig. 3, h) in this form; broken distally. The lower lateral edges and basal concavity are smoothed. Depth of basal concavity, 4 mm.; maximum width is at the base, 24 mm.; maximum thickness is 5.8 mm.

Form 3. (Fig. 3, f and g) Form 3 points are slightly constricted between base and mid-section. Five basal sections are in form 3; none are complete through the mid-section. All show fine bifacial lateral edge retouch and smoothing of the lower lateral edges and basal concavities. The mean basal concavity depth is 2.5 mm. (range 2–3 mm.); mean basal width 20 mm. (range 18–21 mm.).

Form 4. (Fig. 3, d, j and n) Form 4 points are slightly contracted at the base. None of the ten specimens in this form are complete. Two specimens are distally modified. One (Fig. 3, d) has a convex-bit (end scraper form) and one (Fig. 3, j) a straight-bit (gouge form). The latter also has one lateral edge removed by a proximal-distal blow (Epstein, 1963b: 189). All lower lateral edges are smoothed but four specimens are not noticeably smoothed in the basal concavity. Mean basal concavity depth on nine specimens is 3 mm. (range 2–5 mm.). Mean basal width on eight specimens is 20 mm. (range 17–22 mm.).

Two distinctive specimens are classified as Plainview despite their lack of basal sections. Both have lower lateral edge smoothing. The lateral edges are approximately straight and parallel. Maximum widths are 21.7 mm. (Fig. 3, k) and 24 mm. Respective maximum thicknesses are 6.6 mm. and 7.0 mm.

Using a discussion by Wormington (1957: 103–108) as guidance the general flaking technique on the Plainview and other early points from this site can best be characterized as skillful but irregular in pattern. Most specimens of all types show roughly parallel horizontal to irregular shallow flaking. Some elements of the more classic techniques are present but seldom appear to be employed systematically on both faces of a given point. Since basal fragments are predominant,
a truly accurate assessment of overall flaking is severely hampered as evidenced at the Plainview type site (Krieger, 1947: Table 4, 149).

Basal thinning is bifacial and usually accomplished by the removal of one to three major longitudinal flakes and two to five short retouch flakes from the basal curve upward. On seventeen of the twenty-one Plainview points one or more of the major thinning flakes is 10 mm. or over in length. Occasionally these show strong hinge fractures and seem indistinguishable from some on Clovis points but the over all impression is that bold thinning has probably produced this effect fortuitously. Normally the flute-like scars are relatively narrow and shallow in comparison to Clovis.

Bifacial lateral edge retouch is common and sometimes fine. Although many Acton Site specimens show a slight recurve of lower edges this cannot be attributed to excessive edge smoothing.

In sites where Plainview points are numerous often there are some specimens below the size range reported for the type site (Krieger, 1947: 939–942) but otherwise Plainview in attributes. Occasionally such specimens intergrade in basal outline and in some dimensions with the proposed “Midland” type (Wendorf, Krieger, Albritton and Stewart, 1955: 45–49; Wendorf and Krieger, 1959: 67). Recently, supplemental and additional type data are reported by Blaine (1968: 1–11). Apparently “Midland” points are usually widest above mid-section and Plainview points at or below mid-section, but short basal fragments often do not reveal this distinction. Usually, however, when the above degree of intergrading has occurred on a given Plainview point (Fig. 3, f) a typical “Midland” specimen will be much thinner and flatter in cross section at any comparable point. It also will exhibit the very fine, regular, relatively short and steep bifacial edge retouch (Blaine, 1968, Fig. 1) more common to Folsom than Plainview.

Among published reports from Texas and Oklahoma those for the Plainview Site (Krieger, 1947), Nall Site (Baker et al., 1957), Granite Beach Site (Crawford, 1965), and Bonfire Shelter Site (Dibble and Lorrain, 1968) contain both the morphological detail and adequate sampling for useful comparison with Acton Site early points.

Plainview golondrina

There are seven specimens which completely correspond in all observable attributes with the golondrina variety proposed by Johnson (1964: 46–52). One (Fig. 3, b) is intact except for the end of one basal corner or “ear”. Five specimens are basal fragments; one (Fig. 3, i) neatly reworked as a convex bit scraper across the distal end. The last specimen is a very small basal fragment which corresponds so well in
every detail within this category that confident assignment is made. All specimens are smoothed on the lower lateral edges and in the basal concavity. The length of the complete specimen (Fig. 3, b) is 40 mm. (possibly re-worked in distal portion). Its maximum thickness is 7.3 mm.; mean basal concavity depth on six specimens is 5 mm. (range 4–6 mm.). Mean basal width on five specimens is 24 mm. (range 22–27 mm.).

Plainview-like and Altered Plainview

All four specimens in this group have concave basal edges. All are bifacially thinned from the basal edge with one or both faces showing flake scars typical of the Plainview series basal thinning in this site.

The first two have smoothed basal curves. Both appear completely bifacially reworked above this area and retain only a remnant of smoothed lower lateral edge. One (Fig. 3, c) remains a projectile point after irregular reworking but the other is too short to assess.

The last two (Fig. 3, l and m) are not smoothed in basal curve or lateral edges. In the proximal section lateral edges are essentially straight and parallel but they curve inward abruptly in the mid-section and the profile here is asymmetrical. Cross sections of the broken distal ends are essentially lenticular with steep bifacial lateral-medial flaking. These probably were drills or perforators and similar specimens occur on sites with reasonably large Plainview assemblages (Baker et al., 1957; Alexander, 1963; Crawford, 1965).

Plainview Variant

This one point (Fig. 3, o) strongly resembles Plainview but has edges beveled and serrated, on the right. One lower lateral edge has been removed by a proximal-distal blow. The shape is essentially straight and parallel-sided with short convex-sided tip. The lower lateral edge present and the basal concavity are smoothed. Bifacial basal thinning consists of removal of one major central flake and two or three short retouch flakes. General flaking pattern is truly irregular. Length is 51.7 mm. Maximum thickness is 6.0 mm.

Meserve

There are thirteen specimens in this series; none complete. All are beveled on the right edge of each face (all specimens oriented with tip up) and the general flaking pattern is irregular to roughly parallel. Two specimens possibly were modified into perforators or drills instead of points, (Fig. 4, b and e).

The first four (Fig. 4, a, c, and e) specimens have straight, bifacially
retouched and smoothed lower lateral edges. On two, (Fig. 4, a and e) these edges are parallel from the basal corners (form 1) and on the other two (Fig. 4, c) expand very slightly (form 4). All four have smoothed basal concavities; two (Fig. 4, a, and e) exhibit double lateral-medial proximal facets (Epstein, 1963b: 189). Bifacial basal thinning appears typical of Plainview in this site. Only one point (Fig. 4, a) displays irregular edge flaking and asymmetry in the beveled portion to a degree that contrasts obviously with the well formed base. Mean maximum thickness is 6.6 mm. (range 5.8–7.3 mm.); mean maximum basal width on three specimens is 21.2 mm. (range 20.5–21.8 mm.).

The next three specimens have straight to convex smoothed lower lateral edges. One is broken across the lower base; the other two have smoothed concave bases. On all three the lateral edges diverge too strongly from the base to strictly be classified as Plainview in basal outline. All Acton Site Plainview-like specimens which would exceed a 3 mm. difference between basal and maximum width (Krieger, 1947:}

Figure 4. a–f, and h, Meserve points; g Meserve variant.
presently are not classified as Plainview. Basal thinning is bifacial on two of these points. Each has one major thinning flake scar on one face and short multiple thinning scars on the other face. Although all would appear to have approximately similar basal widths, the only measurable base (Fig. 4, b) is 16 mm. wide.

The eighth specimen (Fig. 4, d) has been distally modified into a convex bit scraper form. The angular basal concavity is not typical of Plainview nor is the essentially flat surface of one face. The base was bifacially thinned by removing one central conchoidal flake from each face and three or four shorter retouch flakes. Lower lateral edge retouch is unifacial on alternate right edges. These edges and the basal concavity are smoothed. The lower lateral edges diverge from the basal corners. Basal width is 24.6 mm.

The next four specimens closely resemble each other but contrast with Plainview and the rest of the Acton Site points. None of them retain lower lateral edges. On two points (Fig. 4, f) these have been removed by proximal-distal blows (Epstein, 1963b: 189). What remains of their basal concavities is smoothed. The third specimen is a portion of mid-section which retains the central basal thinning flake scars and a smoothed portion of lateral edge. The opposite edge shows a distal-proximal burin facet (Epstein, 1963b: 187). The fourth is a distal end. These four fragments are essentially flat to only slightly convex across the face and contrast sharply with most Plainview specimens in that respect. Beveling is short, steep and angular, producing a straight-sided rhomboidal cross section. Bifacial basal thinning scars indicate one to three major central flakes were removed from three specimens. All four remarkably match corresponding sections of a plastic cast of Specimen X illustrated by Suhm et al., (1954, Plate 104). They also match a similar specimen in the R. K. Harris collection from Lamar County, Texas. Mean maximum thickness is 6.9 mm. (range 6.8–7.0 mm.).

The last point (Fig. 4, h) has been ground in the basal concavity but lateral edges have been removed by proximal-distal blows (Epstein, 1963b: 189). It is not clearly beveled but extensive secondary and retouch flaking is evident on the right edge. Basal thinning is bifacial with one flute-like central scar and two shorter, and flanking, secondary flake scars on each face.

It is quite possible that some of the shorter basal portions classified under Plainview and Plainview grollerina may have been beveled in the missing distal sections. The latter variety, especially, often has basal attributes comparable to the beveled points which do not appear to be reworked Plainviews.
It is interesting that six points in the “Meserve” category exhibit burin facets. Epstein’s (1963b: 192) observation of the high proportion of such facets on “Meserve” type points as compared with other Paleo-Indian types is supported by the situation at Acton.

In the original definition by Davis (Bell and Hall, 1953: 6-7) the “Meserve” type included both reworked Plainview points and points which may have been reworked. Subsequently Suhm and Jelks (1962: 217) suggested that two types may be represented. We tend to concur in the latter. Unfortunately adequate objective data to enable reliable distinction between the two or more types are lacking. Essentially we cannot reliably establish whether or not the beveling was done by the original makers or their contemporaries. We suspect it usually was; sometimes as part of the original design and sometimes as a modification or repair on Plainview points.

Meserve Variant

This one specimen (Fig. 4, g) has distal edges that are steeply beveled to the right and serrated like Dalton. General face flaking pattern is irregular on one face and oblique on the other. Lower lateral edges are essentially parallel, bifacially retouched and smoothed. Bifacial basal thinning was done by removing seven or eight short flakes to form a steep bevel on one face. The opposite face was thinned by removing two longer central flakes and four short retouch flakes. The basal edge is slightly convex and not smoothed. Length 52.0 mm.; basal width 22.3 mm.; thickness 7.5 mm.

Scottsbluff

Two medial-distal sections (Fig. 5, b and d) are classified as Scottsbluff (Suhm and Jelks, 1962). Both exhibit the thick beautifully symmetrical cross section distinctive in this type. Lateral edges are gently convex in the manner of Scottsbluff I (Wormington, 1957, Fig. 70) and are bifacially edge retouched. Similar but complete points from N. Central Texas are illustrated by Crook and Harris (1955, Plate 12). One Acton specimen (Fig. 5, b) has received a new tip and base at a much later time as evidenced by partial removal of otherwise uniformly heavy patina. Both specimens are skillfully flaked in a somewhat irregular pattern.

San Patrice

One San Patrice point (Fig. 5, c) was found at the Acton Site. This specimen appears to be the very short stemmed variety described and illustrated by Webb (1946, Plate 1, #11, #13) and subsequently
proposed by Duffield (1963: 91) as the *st. johns* variety of San Patrice. Webb (1960: 341) cites R. K. Harris concerning a radiocarbon dating of $5945 \pm 200$ B. P. for a Carrollton Focus site which contained two San Patrice points.

**Angostura**

Four points (illustrated by Fig. 5, a and e) fit the type description (Suhm *et al.*, 1954) as it is limited to Texas specimens. One asymmetrical specimen appears entirely reworked above the basal portion and one is badly spalled, probably by thermal action. Bases are straight to slightly concave and three are smoothed on the basal edge. Lateral edges are smoothed on all four and curve inward below the mid-section on three. One distal section (Fig. 5, e) is alternately beveled to the

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![Angostura points](image)

**Figure 5.** a and e, Angostura; b and d, Scottsbluff; c, San Patrice; f, Untyped.
right in a contrasting rough and irregular fashion that suggests beveling was not part of the original plan. General flaking pattern is irregular to roughly parallel. Except for the one re-worked specimen all are slightly broken at the distal end. Mean basal width 15.5 mm. (range 14.5 — 18.4 mm.). Two measurable points are 22.5 mm. and 23.4 mm. wide at the widest point. Maximum thickness of one is 8.5 mm.

One specimen (Fig. 5, e) has a deposit of white stained red clay tightly adhering to one surface. This deposit appears indicative of long and direct contact with the basic red clay. In situ flakes showing such a limey deposit invariably were found directly on the red clay in moist situations.

Lerma-like

This proximal fragment has lateral edges which expand rapidly from the narrow and slightly convex basal end. Lateral edges are smoothed and bifacially retouched. One face shows short lateral-medial flaking forming a definite medial ridge.

Although a fragmentary specimen, the principal contrast with the type description (Suhrm et al., 1954) lies in the smoothed edges of this specimen. Epstein (1963a: 117) reports Lerma points and Clear Fork gouges from Period 1 at Damp Cave and suggests a possible starting date of B.C. 7000 for this period.

At the Devils Mouth Site Johnson (1964: 83) describes a consecutive three stratum sequence in which a Lerma-like point follows Plainview golondrina and precedes Angostura. Johnson (ibid.: 91) assigns all three to a late Paleo-Indian time horizon, about 6000 B.C. (ibid.: 97).

Untyped Paleo-Indian points

There are twenty untyped specimens which show stylistic attributes common to Paleo-Indian points. Two specimens are essentially complete, eleven are basal fragments and seven are mid-section and tip fragments.

Six of the basal sections, including the two points, show the usual Plainview attributes previously described. However, their lower lateral edges diverge from the basal corners to a greater degree than presently allowable for Plainview. The larger point (Fig. 5, f) also twists gradually to the left from the basal corners to the tip. This series could represent a continuum with Plainview.

The remaining seven fragments with some part of the basal portion
intact vary from flaring through straight to slightly contracted at the base. All show lateral and/or basal concavity smoothing and longitudinal thinning.

Two of the medial-distal sections are beveled to the right and one of these is almost a carbon copy of the corresponding area of (Fig. 3, o) the Plainview variant. Two more of these specimens have been carefully modified on one end. One has a convex-bit scraper edge and one a concave-bit gouge edge. Both are skillfully flaked and probably were originally Paleo-Indian in style and modified by the original makers. Such modifications on typeable points at the Acton Site are confined to the Paleo-Indian points. All of the above and the remaining three specimens show flaking and shape in outline and cross-section that are more common to early points from this site.

Data from mapping.

One Plainview point and one Angostura point were found six feet apart. Subsequent testing revealed no other diagnostic artifacts or lithic concentration remaining in the immediate vicinity. Plowing had reached into dense clay here.

One group of five points could be enclosed in a circle 42 feet in diameter. These were an end scraper on a distal Paleo fragment, a Plainview golondrina, an untyped but like Plainview, an Angostura and a second Plainview golondrina. Again testing disclosed plow disturbed dense red clay and no other diagnostic artifacts or lithic concentration remaining.

The balance of the recorded points were 24 or more feet apart.

Two parts of the same Plainview point (Fig. 3, n) were found 313½ feet apart. One part is slightly patinated but the other is well patinated. One section was recovered downslope where there is a clay and sand mixture plow zone remaining and the other was found upslope on dense red clay where the sand is now gone.

From plotting points on a map of the site, no clustering of typeable points is recognized.

Lithic sources

Virtually all of the collected lithic material appears similar to that found in local river cobbles and sandstone exposures. Nine of the early points are not made from strictly local material. Six of these are made from the blue-gray flint common to central Texas. The nearest good source we know of is about 75 miles south of the Acton Site and on the Leon River. No alibates material was found.
Early point specimens from non-local material.

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<tr>
<th>Type</th>
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<th>Presumed source</th>
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<tr>
<td>Plainview golondrina</td>
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<td>C. Tx.</td>
</tr>
<tr>
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<td>C. Tx.</td>
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<td>C. Tx.</td>
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<tr>
<td>Scottsbluff</td>
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<td>?</td>
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<tr>
<td>Angostura</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>Unclassified</td>
<td>2</td>
<td>C. Tx.</td>
</tr>
</tbody>
</table>

Derived chronology

The temporal estimates for the initial occupation at the Acton Site are largely inferred from the more recent C-14 data concerning Plainview points in Texas sites. James H. Word (personal communication) reports C-14 dates of 6820–7100 B.C. and 6850–7310 B.C. (TX 128 and TX 129, Tamers et al., 1964) for the Baker Shelter in Val Verde County. At Bonfire Shelter in Comstock County (Dibble and Lorrain, 1968, 33) the date is 10,230 ± 160 years (TX 153, Pearson et al., 1965). Willey (1966: 46) cites Agogino concerning a C-14 date of 7320 B.C. for a Plainview-Meserve layer in a Brazos River shelter near Waco, Texas. The latter date appears especially pertinent since the Acton Site is approximately 65 miles above Waco on the same river.

Estimates for the general terminating dates for Plainview have been altered by other data accumulated since 1954. Currently, Story (Suhm) suspects that about 6,000 B.C. may be a more accurate terminal date for Texas specimens (personal communication).

It would appear that, stylistically, the Acton Site Plainview points would represent an initial late Paleo-Indian occupation and that, chronologically, this occupation roughly should date from 6,000 to 7,000 B.C.

The balance of the early point types from Acton probably are not yet sufficiently defined in chronological range to support any further intrasite refinement of priority between types. It is entirely possible that some are essentially contemporaneous at Acton. Most would seem to terminate during the early Archaic in Texas. The youngest of these may be San Patrice which Webb (1946: 15–17) believed could extend into a comparatively late Archaic horizon in Louisiana.

Functional Discussion

No limited functional role can be established for the Acton Site early points. Such points usually are held to represent specialized big game hunting in the late-Pleistocene, since they are found with
the remains of extinct mega-fauna or in corresponding stratigraphic situations. At the Acton Site apparently there was no preservation of any kind of vertebrate remains and the availability of big game is not established. There are some indications that any presumed big game orientation is, at least, undergoing change. The noted skillful modification of early style points into special end scraper and gouge forms could indicate this changing orientation. Since these alterations were confined to the early points they appear to be a contemporary activity and contrast with general high plains Paleo-Indian practice. The maximum use of local lithic sources of mediocre quality apparently is not a common trait of the earlier western Paleo-Indian tradition, particularly when select flint sources were available within reasonable distances.

The concentration of such a large number of early points in a limited area is uncommon. A kill-site can show a similar concentration but there is nothing recognizable in a terrain-oriented sense to suggest this possibility. There would, however, appear to be a repeated use of a limited area predicated on camping and refurbishing activity. A high proportion of basal fragments is generally held to indicate a re-hafting (camp) function.

In total these indications seem to point toward an exploitation of local environment that is more sedentary in nature than is normally expected from big game hunting Paleo-Indians. They quite possibly indicate an adaptation to changing, or changed, food source and environment or economic pattern.

**ARCHAIC POINTS**

This class of artifact is usually referred to as a dart point because of its weight and length—thus, probably it was used with the throwing stick or atlatl. These dart points are considerably heavier than the arrow points used with the bow and arrow, and are made mostly by percussion chipping. Some overlapping of size takes place between the dart and arrow points; however, the arrow points which are usually small, thin, and light, are made by pressure flaking. Some of the small dart points found with arrow points were probably used on arrow shafts, thus making it difficult to establish exact criteria.

The term “body” will be used in this section, instead of “blade”—to refer to that part of the projectile point between the tip or distal end, and the stem.

The analysis of the archaic dart points from the Acton Site shows the presence of both early Archaic and late Archaic activity. A total of 75 dart points are in the collection. Of these 75 specimens, 26 speci-
mens are broken to the extent that they cannot be typed—thus leaving 49 specimens that can be typed, or discussed. Of the 49 specimens, 34 specimens appear to belong to the early Archaic, and 15 specimens belong to the late Archaic. The early and late Archaic types will be discussed separately. All Archaic specimens are made from materials that can be found locally on the terraces of the Brazos River. Table I gives a breakdown of the dart points by types.

**Early Archaic Points**

The 34 specimens in this group can be broken down into 9 types, and 2 specimens will be discussed under "varia."

Bulverde (3 specimens, Fig. 6, a)

This type fits the description given in the Texas Handbook (Suhm, Krieger and Jelks, 1954: 404). Two specimens from the Acton Site have slightly smoothed lateral edges and bases of the stem.

![Figure 6. Early Archaic points: a, Bulverde; b, Dallas; c, Martindale; d, Peder- nales; e, Nolan; f, Varia; g, Travis; h, Carrollton; i, Darl; j, Wheeler Leaf.](image-url)
TABLE 1
Archaic projectile point types

Early Archaic Dart Points

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<thead>
<tr>
<th>Type</th>
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<td>Bulverde</td>
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<tr>
<td>Carrolton</td>
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<tr>
<td>Dallas</td>
<td>2</td>
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<tr>
<td>Darl</td>
<td>12</td>
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<td>Martindale</td>
<td>2</td>
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<tr>
<td>Nolan</td>
<td>3</td>
</tr>
<tr>
<td>Pedernales</td>
<td>5</td>
</tr>
<tr>
<td>Travis</td>
<td>1</td>
</tr>
<tr>
<td>Wheeler Leaf</td>
<td>2</td>
</tr>
<tr>
<td>Varia</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

Late Archaic Dart Points

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<td>Fairland</td>
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</tr>
<tr>
<td>Gary</td>
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</tr>
<tr>
<td>Godley</td>
<td>1</td>
</tr>
<tr>
<td>Palmillas</td>
<td>1</td>
</tr>
<tr>
<td>Yarbrough</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

Total Archaic Projectile Point Types Classified 49

Carrollton (2 specimens, Fig. 6, h)

This Carrollton Focus type is described in Special Bulletin No. 1, Oklahoma Anthropological Society (Bell, 1958: 12). Both specimens of this type from Acton have smoothing of the lateral edges and bases of the stem.¹

Dallas (2 specimens, Fig. 6, b)

This Carrollton Focus Type is described in Special Bulletin No. 2, Oklahoma Anthropological Society (Bell, 1960: 24). Both specimens from Acton have smoothed stems and bases.

Darl (12 specimens, Fig. 6, i)

A description of this type is found in the Texas Handbook (Suhm, et al., 1954: 414). The type is described as having the lateral edges of

¹ For all descriptions of the Carrollton and Elam Foci Type points, refer to the Oklahoma Handbooks, as the Texas Handbooks do not always have as accurate descriptions and illustrations.
the stem "sometimes smoothed." Nine of the 12 specimens (75%) from Acton have smooth lateral edges or bases. In the Texas Handbook, the estimated age is possibly from about the time of Christ to 1000 A.D. The high percentage of smoothed bases and lateral edges at Acton would seem to place this type in early Archaic. Also, the Darl Type occurs in the Carrollton Focus, in small numbers, probably as trade points (see two C-14 dates under Netsinkers in this paper).

Martindale (2 specimens, Fig. 6, c)
A description of this type is found in the Texas Handbook (Suhm, et al., 1954: 446).

Nolan (3 specimens, Fig. 6, e)
A description of this type is found in the Texas Handbook (Suhm, et al., 1954: 458). In this description, they do not mention smoothing of the lateral edges of this type. Two of the specimens have some smoothing of the lateral edges.

Pedernales (5 specimens, Fig. 6, d)
The description of this type is found in the Texas Handbook (Suhm, et al., 1954: 468). In this description, they state that the stem of this type is rarely ever smoothed. Three of the 5 specimens from Acton have smoothed lateral edges, and two of these have smoothed bases.

Travis (1 specimen, Fig. 6, g)
A description of this type is given in the Texas Handbook (Suhm, et al., 1954: 484). The one specimen from Acton fits the description.

Wheeler Leaf (2 specimens, Fig. 6, j)
This type occurs in the Carrollton Focus of the Trinity Aspect, ranking third in percentage in point types of this focus (Crook and Harris, 1954: 3). The body is usually long and narrow, and there is no stem. The base is sometimes straight, at other times, convex or concave. Where bifacing has not been completed, the bulb of percussion may still be faintly seen on some specimens. Most of these pieces appear to be made from blades. Chipping is sometimes fine pressure flaking, resembling Paleo flaking, but on some specimens only percussion flaking is present. Many specimens have flaws develop during chipping—thus causing the piece to be abandoned. It is the opinion of Crook and Harris that this type is probably a preform for making either Paleo or Archaic points. The illustrated specimen (Fig. 6, j) from Acton appears to be an unfinished Paleo point in which a
flaw developed near the distal end. There is some small evidence of smoothing of the lateral edges near the base.

Varia (2 specimens, Fig. 6, f)

These two specimens are very, very similar, and cannot be placed in any known type. The body of these points is triangular, with straight to slightly convex edges between the distal end and the shoulders. The shoulders are very weak. The stem, which is about 1/3 the length of the entire point, has slightly concave lateral edges, which have been smoothed. The bases are concave. Both specimens have some fine pressure flaking, resembling Paleo flaking, in some areas. In other areas some percussion flaking is present. On both specimens, the edges of the body are serrated. The maximum length of the two specimens is about 50 mm., and the maximum width is 22 mm. LeRoy Johnson (1964: Fig. 17, J) illustrates a specimen which he calls a “miscellaneous Paleo-Indian point.” The two specimens from Acton somewhat resemble his specimen, but there are some differences. Until more specimens of this type are found in situ, it is not clear whether the point belongs to the Paleo or Archaic period.

The above named specimens are types found in the Edwards Plateau Aspect, Archaic Stage and the Carrollton Focus, Trinity Aspect. Time-wise, they seem to be dated around 4000 to 3000 B.C. and fit well with the two C-14 dates for Carrollton Focus discussed in this paper, under Netsinkers or Atlatl weights.

**LATE ARCHAIC POINTS**

Fifteen specimens from Acton seem to belong to the late Archaic period. These dart point types are discussed below.

Edgewood (3 specimens, Fig. 7, a)

These specimens fit the descriptions given in the Texas Handbook (Suhm, et al., 1954: 418).

Evans-variant (1 specimen, Fig. 7, b)

This specimen is a variant of the Evans point found in Late Archaic Sites in Louisiana (H. F. Gregory, personal communication 1968). The Evans type has been described by Ford and Webb (1956: 64). The difference between the description by Ford and Webb, and this variant, is in the base. This variant has one or two flakes removed across the base—from each side.
Fairland (1 specimen, Fig. 7, d)

A description of this type is given in the Texas Handbook (Suhtm, et al., 1954: 424). In the handbook, no mention is made of beveling the stem. On the Acton specimen however, the stem is beveled in the same way as the Nolan Type.

Gary (3 specimens, Fig. 7, c)

A description of this type is given in the Texas Handbook (Suhtm, et al., 1954: 430). The specimens from Acton fit well within the type.

Godley (1 specimen, Fig. 7, e)

A description of this type is given in The Kyle Site report (Jelks, 1962: 40). The specimen from Acton fits the description.

Palmillas (1 specimen, Fig. 7, f)

A description of this type is given in the Texas Handbook (Suhtm, et al., 1954: 462), and the specimen from Acton is within the type range.
Yarbrough (5 specimens, Fig. 7, g)

A description of this type is given in the Texas Handbook (Suhm, *et al.*, 1954), and the specimens from Acton fit well within the description.

All of the specimens in the Acton Site, belonging to Late Archaic, appear to have been in use from roughly 1000 B.C. to around 500 A.D. It is entirely possible that some of these Late Archaic tool types may have also extended into the Neo-American period; however, only further excavation can determine this fact.

Judging from the scarcity of certain projectile point types, and other diagnostic tools such as small end-scrapers, drills or perforators, occupation during the Late Archaic period was much lighter than the preceding Early Archaic period.

**NEO-AMERICAN POINTS**

A total of 10 specimens of this type of projectile point have been recovered from the Acton Site. Five of the 10 specimens can be typed. The other 5 specimens are too fragmentary to be typed. As a group, the arrow points are relatively small and thin, with pointed distal ends, and well defined stems. They are all made from local cherts and flints found along the Brazos River. Based primarily on variations in outline, the five typeable specimens are grouped into three well known types: Cliffton, Perdiz and Scallorn, all of which are usually found in Neo-American Sites.

Cliffton (1 specimen)

This one specimen has a triangular body with convex lateral edges, and a contracting stem. A small part of the distal end is broken off, but the length was probably about 30 mm. The maximum width is 20 mm., and the stem length is 3 mm. These dimensions fit well within the Cliffton Type (Suhm, *et al.*, 1954: 496, Plate 127 D and E).

Perdiz (2 specimens)

This type has contracting stems and triangular bodies, with straight to slightly concave lateral edges. The shoulders are prominent with sharp barbs. The maximum length of 30 mm. and the maximum width of 21 mm. fit well within this type (Suhm, *et al.*, 1954: 504, Plate 131 C-E).

Scallorn (2 specimens)

Each of these specimens has an expanding short stem, and a some-
what long, triangular body, with slightly concave lateral edges. Small, fine serrations occur along the lateral edges. The maximum length of 33 mm. and maximum width of 19 mm. of the specimens fits well within this type (Suhm, et al., 1954: 506, Plate 132 A-C).

The number of specimens of arrow points found at the Acton Site is very low, and no other tools of the Neo-American period have been found. This would indicate that during the Neo-American period, this site had little or no occupation. In many of the sandy fields along the Brazos River, one may find occasional arrow points probably lost in hunting, with no signs however, of a village site in the area of the finds.

OTHER ARTIFACTS OF FLAKED STONE

Tools other than projectile points do not offer much material for comparison and discussion since they have not been studied systematically by more than a very few workers in this part of North America. There is such a confusion in the terminology of scrapers and bifaces as well as some other tools that we have adopted a slightly modified European system. We see no advantages to the outmoded local systems that employ such terminology as “scraper type D-2” or “Jonesville knife.” We deplore the setting up of new typological systems or names based on small collections and highly recommend the use of this system which is in use in most of the world outside of the United States.

**Tool List**

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<tr>
<th>Tool Type</th>
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<td>Archaic points</td>
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<td>Arrow points</td>
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<td>Drills</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>Borers</td>
<td>4</td>
<td>0.4</td>
</tr>
<tr>
<td>Gravers</td>
<td>30</td>
<td>2.8</td>
</tr>
<tr>
<td>Denticulates</td>
<td>28</td>
<td>2.6</td>
</tr>
<tr>
<td>Notches</td>
<td>67</td>
<td>6.2</td>
</tr>
<tr>
<td>Retouched Flakes</td>
<td>114</td>
<td>10.6</td>
</tr>
<tr>
<td>Varia</td>
<td>6</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1076</td>
<td>100.1</td>
</tr>
</tbody>
</table>

**Scrapers**

This broad category of tools is divided into seven types plus a group of non-conformable specimens. Before this collection was examined, we had some slight reservations about the applicability of the so-called European terminology. Now, there remains no such concern, for these artifacts respond remarkably well.

The key to scraper classification is to orient the tool with the proximal end of the flake or blade nearest the viewer and the bulbar side down. Thus, end-scrapers will have the majority of the retouch at the distal end of the flake or blade and side scrapers will show the retouch on one side or the other. We were unable to discover any significance in separating straight from convex edges among the side scrapers. Concave (hollow) scrapers appear to be a distinct type.

In general, 60% of the scrapers were made on cortex pieces. Less than 2% are on blades and 4% are on cores. More than 42% of the scrapers have had the bulb of percussion chipped away or reduced by
flat retouch. Flakes with flat retouch along a thin edge have not been included among the scrapers but are classified as retouched flakes.

Side scraper (72 specimens)

Side scrapers show regular percussion retouch along all or most of one edge and the retouch is unifacial. Secondary retouch consisting of smaller, shorter flakes, smooth out the bit (Fig. 8, a). The working edge is essentially parallel to the axis of the flake, and that edge is straight to convex. Mean length is 60 mm.

End-scraper (58 specimens)

The working edge is always convex, usually at the distal end of the flake or blade, but occasionally appears at the proximal end. The angles of the cutting edges vary considerably and the artifact is longer than it is wide. Mean length is 47 mm. considerably smaller than that of the side scrapers (Fig. 8, b).

Transverse scrapers (29 specimens)

This tool is similar to an end scraper, but is wider than it is long; in other words, it is fan-shaped with a flatter curve. Mean length is 40 mm. and mean width is 54 mm. (Fig. 8, d).
Concave scrapers (25 specimens)

These are not spokeshaves because of the large diameter of the working edge. Working edges face from 45° toward the proximal end, through parallel to the long axis, to 45° toward the distal end of the flake. Mean length is 63 mm. (Fig. 8, c).

Multiple edge scrapers (81 specimens)

Several varieties are included here: scrapers with two edges (21); scrapers with two edges that meet in a distinct point located 45° off the main axis, sometimes called *dejeté* (34); side-end scrapers (18); and end-scrapers on a retouched piece (7). The latter show strong retouch along one or both lateral edges of the end-scraper (Fig. 8, e and f).

Oblique scrapers (22 specimens)

The working edge resembles that of a side scraper, but is placed approximately 45° off the main axis of the flake. This category does not include the concave scrapers. Mean length is 46 mm. (Fig. 8, g).

Core scrapers (12 specimens)

These tools are difficult to recognize unless one is an experienced flint worker. The working edge is that of a scraper and is not just corrective core trimming. Corrective core retouch consists of fine percussion work, usually of flakes up to 5 mm. in length, which removes the platform overhang. A core scraper must have an edge similar to that described for a side scraper. Concave and convex edges are equally represented.

Scrapers on points (in tool list as points)

Five Paleo-points have their distal ends reworked into end-scrapers. The workmanship and result is similar to the end-scrapers made on flakes.

Various scrapers (13 specimens)

These are unusual pieces, some with combinations of obverse and inverse retouch or with combinations of concave and convex working edges.

**Gouges**

Gouges were classified as a group following the original definitions of Ray (1941: 152–161). In this assemblage each specimen has most of the following attributes:
1. Outline is sub-triangular.
2. Bit is at right angles to the long axis.
3. Bit is straight to slightly concave.
4. Gouge is thicker toward the bit end.
5. The cross section is nearly plano-convex.
6. The bit is usually the steepest edge.

There appear to be three types of gouges. Although one of these, the last, is poorly represented in this assemblage, it is abundant in south Texas.

1. Gouges made on bifaces.
2. Gouges made on flakes.
   a. Bulbar surface not retouched.
   b. Bulb of percussion removed or reduced (Fig. 11, e).
3. Gouges made on pebbles with smooth cortex on the ventral surface.

Gouges on bifaces (52 specimens)

In this assemblage the gouge made on a biface was most frequent (Fig. 9). Thirty specimens are plano-convex with a plano ventral surface. Five are plano-convex with convex ventral surface (Fig. 11, d) and 17 are bi-convex. Two additional specimens are made on the distal portions of Paleo-points.

Gouges on flakes (12 specimens)

Ten of these specimens have reduced bulbs of percussion.

Gouges on pebbles (1 specimen)

This form of gouge apparently is not a common type for this region. The flat or “under” face is the cortex surface of the pebble.

**BIFACES**

Bifaces are larger and heavier than the projectile points. They lack such alterations as fluting, notching or shouldering, and essentially are not as well finished as the points. These tools would be called knives or blades by some authorities, but we would prefer to avoid such conflicting terminology.

Biface foliates (107 specimens)

The foliates are reasonably thin with quite a few specimens showing pressure retouch (Fig. 10). It is interesting to note that all but 13
Figure 9. Gouges.
Figure 10. Biface foliates.
specimens are broken. Does this suggest some rough usage? The edges show little evidence of battering, raking, or splintering.

Biface blanks (75 specimens)

None of these artifacts seem to be suitable for use as tools in the condition they are in. There is little question but what they are partially finished bifaces. Many of them clearly show where the maker was unable to remove a “knot” in spite of repeated blows.

**Burins**

There are a number of types as can be seen in the type list above. Eight of these are of dubious character since they were struck directly from the edges of points and not from a snapped or truncated platform. The rest are true burins, many of which could be lost in Old World collections (Fig. 11, a, b, and c). Almost all of the latter are on snapped pieces or on truncations.

While it is possible that a few of the burin spalls on the points could have been the result of the point striking a hard object, this cannot explain the spalls that originate on the proximal ends. A number of experiments conducted in the laboratory were unable to produce a

![Figure 11. a–c, Burins; d, gouge, inverse bit; e, gouge, thinned bulb; f, netsinker?](image-url)
lateral-medial spall by working a concave-base point within its bindings on a shaft. Our conclusions were that the spalls were produced by blows, not pressure.

**Drills**

Drills are bifacially flaked and pressure retouched. All three are on Paleo-points.

**Borers**

These small artifacts show bifacial retouch only at the working tip. They are on small flakes, frequently biface thinning flakes.

**Denticulates**

Otherwise known as serrated-edged pieces, the denticulates are unifacially or bifacially worked with three or more uniformly spaced teeth.

**Notches**

Notches correspond to spokeshaves in other terminology. Since we do not know their use, we feel the descriptive term is best. The diameter of a notch is much smaller than that of a concave scraper, usually 5 to 15 mm. A single notch is near the distal tip of a broken Paleo-point.

**Retouched Flakes**

Most of these are probably tools of expediency, and the chief characteristic is the quality of not being a finished piece. Many of these tools are “flake scrapers” or the like. The worked edges are on the border between deliberate retouch as found on true scrapers and heavy use retouch.

**Varia**

Oddly shaped bifaces, inversely retouched scrapers and other unusual tools that do not fit into normal types are placed in this group.

Working with a large collection is rewarding in that one can not only see how well these materials fit the European forms, but one is permitted to generalize on the range of tool types. There are several comments that should be made. The scrapers are larger and show better workmanship than was expected. There are only a few idiosyncratic pieces which might unfortunately be called types in some local systems.

The frequency and variety of burins was unexpected, but probably will not be so when more early sites are examined. Epstein (1960: 93–97) has called Texas burins to our attention, but few others seem to have noticed the frequency of burins on truncations in early sites.
Alexander (1963: 521–523), despite obvious problems with his terminology, apparently recovered 7 or 13 specimens at the Levi Site.

There is no way to separate the non projectile point artifacts into Paleo, Early Archaic or Late Archaic even though the points suggest that the site was occupied during these eras. There is a strong consistency of material, of workmanship, of tool size, and of horizontal distribution that argues against sharply distinct cultural components. Rather, there is an impression of relatively continuous utilization of the same environment by the same ethnic group.

TECHNOLOGY OF FLAKED STONE

Technological processes at the site may have been varied, but the only one on which we were able to collect considerable data is stone flaking. In the debris we find cores, cortex flakes, biface thinning flakes (eclat de taille) and chips. While these demonstrate that considerable flaking was done at the site, there is an unbalance in cores and cortex flakes that indicates the shaping of biface blanks and the production of debitage at some other place, perhaps a gravel bar.

On the projectile points the remains or traces of the technology have largely been removed, but the scrapers tell us a great deal. Ninety-six percent of these tools were made on flakes. Sixty percent of the scrapers are on cortex flakes, and 42.5% had the bulbs of percussion deliberately reduced by retouch.

There is no question but what this is essentially a flake industry. The few blades that appear in the debitage form just over two percent of the total. Practically all of the tools which permit this sort of examination were made on flakes.

Within the large collection of cores (126 classifiable) there are few, if any, that could have produced a flake or blade large enough to permit the manufacture of most of the biface foliates. It probably should be assumed that most of these tools were made directly from cobbles (core-tool rather than flake-tool). Much of this kind of flaking, as was mentioned above, seems to have been done elsewhere. Cores, however, were the source of material for other tools. From an inspection of these artifacts we find that 34.1% had single platforms, 26.2% had opposed platforms, 23% were more or less globular, and 16.7% had platforms at 90° to each other.

Prepared platforms appear on 54.3% of the cores while the rest show only cortex. Flint was the overwhelming choice of material with quartzite a poor second.

The following is the gross breakdown of artifacts:
Chips .......................... 3515 46.6%
Cores and fragments ........... 319  4.2
Cortex flakes .................. 542  7.2
Biface thinning flakes ........ 375  5.0
Debitage ........................ 1265 16.8
Use retouch ..................... 452  6.0
Tools ............................ 1068 14.2

Total  7536  100.0

Chips were saved if they were large enough to be retained on ¼" hardware cloth. Unfortunately, this did not permit the collection of most of the debris of pressure chipping, but that would have been an impossible undertaking. Cortex flakes are less frequent than the ten or eleven percent often found at Archaic sites, but there are no available figures for Paleo sites.

Biface thinning flakes were so classified only if the platform consisted of the opposite edge of the biface and the angle between the platform and the bulb was very acute. The figure of 5% seems somewhat low, and again may reflect the practice of doing some preforming at the source of the river cobbles.

Debitage, those flakes and blades available for use as tools but not used, is of the same material and reflects the same technological processes as do the tools and the debris.

Use retouch is found mostly on pieces that otherwise would have been classified as debitage. Equipment similar to that used by Seminov (1964) was not available for studies of used edges and therefore our studies are incomplete. Experiments in the laboratory indicate that similar regular rows of tiny flake scars on sharp flakes can be produced by lightly scraping bone or vigorously scraping wood. We are not in a position to comment on the cutting of soft material such as meat, hides etc.

**GRINDING STONES**

There are 151 specimens of complete or fragmentary manos (handstones). Fifteen of these are made from stream-rolled cobbles and 136 are made from sandstone rubble. Five cobbles are pecked to shape, and the grinding surfaces are sharpened by pecking. Two of these are rounded in outline and three are subrectangular. The rounded specimens have a mean diameter of 9.5 cm. The subrectangular manos have mean lengths of about 9.5 cm. and widths of about 7.0 cm. Two specimens show to-and-fro use and the ridge between the grinding facets runs diagonally across their faces. Only two of these cobble manos have been used on both faces.
Ten cobbles have been used as manos without any shaping. All of these are of quartzite and two of these show use on both faces. Dimensions range from 5 to 8 cm. in width and 7 to 10 cm. in length. Thicknesses would vary according to amount of use.
One hundred and thirty-six manos or fragments are made from stream cobbles or rubble, but are so altered that one cannot be certain. Seven examples are quite round, 24 are subrectangular to square, and all the rest are irregular or fragmentary. Of the 136 manos or fragments, 58 have been used on both faces and 78 have been used on only one. A number show a crest between two facets, some of these are parallel to the long axis and some are diagonal. Exact numbers are not given because of the fragmentary condition of the sample.

Metates or milling stones are also abundant at the site. One specimen had been used on both faces, ground to a depth of 0.4 cm. and is 13.5 cm. wide by 26.5 cm. long. The second was used on one face only. The oval basin is 0.5 cm. deep, 14.0 cm. wide and 30.5 cm. long.

Fragments of metates or milling stones number 164 specimens. Of these, some 52 specimens have shallow basins to deep narrow basins. Eight fragments show use on both faces. In addition to all of the grinding stones listed above, there are 57 fragments that may be either manos or metates.

Because of the wide distribution of the grinding stones and fragments, over the same area as that of the Paleo-Indian and the Archaic points, it is believed that they date from the same time period as do those points.

NETSINKERS OR ATLATL WEIGHTS

Ten specimens of this type artifact are in the collection from the Acton Site. Frank Watt of Waco described this artifact (Watt, 1938: 21–70), and divided it into 12 types. He named it the “Waco Sinker,” but remarked that this did not infer that the artifact was used as a fishing sinker. Using Watt’s classification, these artifacts from the Acton Site are typed as follows:3 specimens, type 3; 2 specimens, type 4; 1 specimen, type 9; 2 specimens, type 10; and 1 specimen, unfinished.

Some of these artifacts are made from quartz or quartzite pebbles, while others are made from sandstone. They are chipped, pecked, and ground into roughly a long, egg-shaped piece; and then notches are chipped or ground in each end. All of the specimens from the Acton Site are made from local materials. One specimen (type 4) came from Test B (level 2, 6” to 12”) at the site, and was found in a cluster of pebbles and flakes below the plow zone. It is shown in Fig. 11, f.

This type artifact is always found in sites of the “Carrollton Focus” of the “Trinity Aspect.” A carbon-14 date of 5945 ± 200 B.P. (3986 ± 200 B.C.) was obtained from the Carrollton Focus Zone at the Wood Pit Site (Crook and Harris, 1959: 1–2). Another Carrollton Focus
radiocarbon date of 6030 ± 300 B.P. (4066 ± 300 B.C.) was obtained from a hearth at Gore Pit Site (Bastian, 1964: 1–4), located near Lawton, Oklahoma.

**CONCLUSIONS**

We have attempted to accomplish several purposes in this paper, the most important of which is the description of the environment, artifacts and chronology of the Acton Site. The projectile points have been treated in more or less the traditional way, but the other tools have been classified in a modern or modified-European system. Basic to this system is the recognition that form can be described whereas use is frequently speculative. In addition, we have classified the debris and debitage into various steps in the manufacturing process. The value of presenting this kind of information will not be apparent until a number of sites have been reported in this manner and systematic comparisons have been made.

The Acton site was the scene of considerable activity over a long period of time. In regard to the activity, it is apparent that just about every kind of work went on at the site since numbers of all kinds of tools were found as well as all sorts of debris and debitage. In other words, the site was apparently not the scene of one or two highly specialized kinds of work, play or duty.

If there were any sub areas of specialized activity, we did not discern them. Repeated ploughing of the field may have been responsible in part for scattering artifacts, but had specific concentrations of cores or particular tools existed, we believe they would have been detected. Paleo points, Archaic points, various other types of tools as well as debris and debitage were rather evenly scattered over the field. It is believed that this distribution of artifacts argues against the existence of a large group which include specialists in certain arts and crafts. Instead, it would appear that small bands repeatedly or continuously camped at the site. There are, unfortunately, no specific hearths or concentrations that can be interpreted as single camps. There are no data which could confirm or deny seasonal occupation of distinct sites, beyond the observations made above that all kinds of artifacts were recovered at the site.

There is no accurate technique to determine the length of time during which the site was occupied. The very small “Arrowpoints” can be dismissed with a clear conscience as being hunting losses as there are no other tools at the site that correspond in time. Particularly scarce to absent are the small end-scrapers, serrated pieces, drills and most significantly pottery. Technologically, and, we believe, typologi-
cally the assemblage resulting from the major part of the occupation consists of the Paleo points, the Archaic points, and the various scrapers, bifaces, burins and so forth. To consider just the projectile points could lead to a traditional view that there were two occupations: one Paleo-Indian and one Archaic. It is not possible in this assemblage to separate out two categories of tools, one Paleo and one Archaic.

Thirty-two projectile points were reworked into burins, scrapers, gouges or notched pieces. It must be emphasized that thirty-one of the above are Paleo points. We cannot accept the backward hypothesis that a Late Archaic People went out and collected Paleo points for the purpose of reworking into other tools.

From the technological viewpoint the tools are characterized by a uniformity of processes of manufacture that is observable both in the Paleo points and Early Archaic points as well as in the scrapers, foliates and gouges. Comparative literature on tools of the Archaic other than projectile points and “knives” is distressingly weak in Texas. To the best of our ability, we were able to discover only a fraction of the scrapers, gouges and retouched flakes within the Acton assemblage that would appear to be compatible with the few Late Archaic dart points. There are probably a few artifacts in this collection that are not part of the assemblage in a cultural sense. These include the late small arrow points and possibly some of the Late Archaic points. These amount to a very small percentage of the total artifacts. For statistical purposes it is believed that the typological and technological lists represent essentially a single culture, certainly an adaptation to one environment.

Our conclusions, therefore, are that the site represents a single homogeneous group of Indians who lived there intermittently, seasonally or perhaps for rather long periods of time. The cultural picture is that of a transition from what has been called Late Paleo-Indian to Early Archaic. We cannot force the data to produce more than the mere suggestion that the social unit was a hunting-gathering-fishing band who made and used all of their varied tools at or near the site.

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INTRODUCTION

As long as I was just a collector, everything seemed O.K. hobby wise. When I came to look upon myself as an amateur archaeologist, I became dissatisfied. Why? Well, in the latter state, one should have enough knowledge to answer simple questions concerning archaeology. For example—where in archaeology can one read that lithic knives were adapted to wood working, sewing or household chores, and for the hunt? Where can one read why the answers may or may not be so? Questions of this nature have always intrigued me.

Finally, I realized that Typology had a new baby brother called Technology, and that with the two of them, I might again be happy in archaeology because through technology I might answer some of my own questions. I resolved to proceed in the following manner. Do the things with lithics that the Indian did. Learn to make my own lithic tools. Determine what lithic materials will or will not do.

As a direct result of these experiments in technology I have found some answers that are presented in the titles following this introduction. My experiments are continuing. Here is a partial list of questions that I have subjected to research and experiment. Why have lithic knives not been studied in order that their use-class can be recognized? Why do we not have bifacially flaked knives with the artifact inventories of the Clovis point kill sites (Sollberger, 1968)? Why are beveled knives beveled? Why should some artifacts be classed as a hand axe when it often has a thin curved blade with a fine sharp pressure retouched edge that would obviously break at the first chop into wood or bone? Is it true that one can examine lithic artifacts and say—this was done with a hard or soft hammer stone, this with a billet, or this by pressure?

Among all the questions that I have asked myself, one of the most pressing has been, can one engage himself in lithic typology and technology with conviction and not be able to duplicate the artifacts as well as make actual use of them in serious work projects? Can the steel age mind accurately guess use, class and type, without actually working with the tools?

These are only some of my questions. My attempts for answers these
past few years, involve many hours and days of flint knapping, quarrying, heat-treating of the silica stones, chopping, cutting, boring, and reaming.

Projects are designed to simulate those I logically expect that the Indian engaged in. I have acquired some understanding of the qualities and limitations of lithic materials, and perhaps, some knowledge of them that the Indian may have applied in using these materials as tools and weapons.

From the above, I do not suggest that my answers are the ultimate, or proof positive of use and type. I do believe that by combining a working knowledge of the capabilities of lithic materials with the experience of making and using the various artifact replicas will permit the archaeologist to classify and type artifacts with much more certain confidence. This approach to typology places the steel age mind and logic in a secondary position to demonstrable facts. These facts, homogenized with logic, should build some acceptable bridges beyond the old stymie of proof positive.

THE LITHIC KNIFE

A lithic knife is a tool used by man that has an edge that is capable of dividing, portioning, or shaping object materials, with the addition of force or pressure administered by man.

This tool therefore, may be very elementary. It may be a naturally sharp stone edge made by nature or it may be a purposely made spall, flake, blade, uniface, or bifacially chipped flake or core. This cutting edge may also be stone that has been pecked, ground and polished.

Knives fall into a number of different classes. Expendable knives had short lives because of the severe nature of work they were put to. These have a minimum of labor devoted to their manufacture. Long life knives are finely wrought specimens used on materials that are soft and easily cut. Wood working knives for coarse wood work are heavy bodied and strong to inhibit breakage. Wood working knives designed for across the grain cutting (butt-ends and square cuts) have especially designed cutting edges that are out of line both lineally and vertically. Finer work on softer materials required cutting edges that were in line both lineally and vertically.

Unretouched flake knives will debark and shave limbs of wood for dart shafts, handles, etc., considerably smoother and faster than will biface edges. Flake knives will shape and reduce shafts in diameter easier and faster than will biface edges. Long uniform smooth shavings are easier and more possible with unretouched flake knives than with biface edges. Fabric and leather may be cut straighter, easier, and more
intricately with a naturally sharp flake edge. The above is true because
the cutting edge of a flake is even and in line both lineally and
vertically. It is not interrupted by being wavy and ridged as is the
dge pattern of a biface. The flake edge is razor like and does not
clog-up and has a minimum of friction. The biface edge collects fibers,
its undulations increase friction, the cut is wider, coarser and uneven—
which reduces the strength of leather strings or thongs. Flake type
knives were sharpened unifacially (beveled) to preserve the straighter
non clogging cutting edge.

The minus factors of flake knives may have resulted in the develop-
ment of biface knives. The biface knife has up to 100% lineal cutting
dge. Unnecessary bulk and thickness is eliminated. Being thin, it is
capable of being resharpened many times making it the equivalent of
many flake knives. The biface knife is more adaptable to shaping that
will incorporate versatility such as points, punches, reamers, etc. If
large, portability is improved. Hafting is provided for and more easily
accomplished.

From the evidence as presented above, knives have attributes or
 technological applications in their manufacture that divides them in
use and function. In classifying artifacts as knives, edge technology
must be considered.

The raw material for knives originates at quarry sites or from
 cobbles stones. Material quality influences both the class and quality of
the knife produced. An artifact in the knife class is a finished product.
It must not be classed as a knife while in the quarry blank stage or in
the intermediate stages of completion. Such partial unifaces and in-
complete bifaces should be so listed in site or type inventories.

Once class has been determined, typology can be considered. Be-
cause artifacts so often could be used out of class, the major function
must be used to determine type. Knives have been separated from dart
points and spear points in the past on the basis that knives are broader
and/or have more rounding points—making them unsuitable as pene-
trators. J. T. Patterson (1936) makes the separation where the stem or
tang is out of line of flight with the point—hence they could not be
used as spears or dart points. Projectiles receive almost no wear
between the point and the haft: therefore, those that show wear or
polish on these lineal edges were used as knives.

I propose a knife is not a knife, in class, or type, until it is proven to
be so by wear evidence or edge technology.

THE ABRADING KNIFE

I searched through the artifact tool inventories for a tool that would
make a neat, nearly square, end cut on limbs and small saplings. This was a need the Indian faced in making construction materials, arrows, handles for hoes, knives, celts, and axes. Many experiments proved that the ground edge and the chipped edge axes will not fill this requirement.

The right tool was found in the archaeologists scrap pile. Namely, the quarry blank, the large rough biface, the unfinished blade, or the cache of blanks. Certain ones of these have the lineal edge character, the use marks of wear and the proven ability to end my search. With them, I have cut a number of small saplings and limbs in the proper sizes for the haftings listed above, and have found them to work easier, neater, and often quicker than stone or flint axes. The small willowy limbs that are a bit large for severing, in any fashion, with a normal edged biface knife are next to impossible to sever with a stone axe. The stone axe or the flake axe will in this case produce only a long tapering cut accompanied by much bruising and mashing. The abrad- ing knife will cut these same limbs neatly, and with almost no effort.

Another type of knife, the knife for dressing game and for preparing hides calls for a light, straight, and sharp cutting edge. Straight, as opposed to undulating or wavy, so that the skin or leather cuts will be smooth and even and not burred. Sharp for ease of cutting. In line, as opposed to serrated, for smoothness of cut. Thin, to eliminate side friction and drag. This means that butchering and general utility knives will have as their diagnostic feature a very carefully pressure flaked edge. These qualities however, represent the opposite require- ments needed for making cuts across the grain on wood. Cutting wood demands a strong edge that will not break or dull so quickly and easily. A saw has teeth that are “set” out from the blade. A saw passes through a cut leaving parallel planes adjacent to each face. True saws are next to impossible to fabricate with lithic materials.

The abrading knife is not a saw. It is a biface with long, fairly straight, lineal edges. These edges are cupped and wavy from per- cussion flaking. The ridges between flake scars are left high and un- retouched. These ridges, at the lineal edge, do the abrading away of the wood fibres that are cut partially loose by the lineal cutting edges of the blade between the ridge ends. The tool is used like a saw— pushed back and forth. An additional simultaneous motion is added—the rocking of the tool left and right. This widens the cut to prevent wedging the tool in the cut. It is also essential because it digs the ridge points into the side of the cut. This not only removes the fibres raised by the cutting edge, it also controls the width of the cut and the angle
of the cut. Work progresses around the circumference, as does a beaver.

Four such heavy duty wood working tools from Edwards Plateau Aspect Sites, Kerr County, Texas are illustrated (Fig. 1). They are efficient for cross cut or square end cuts on wood. Example a. is 142 mm. long, 62 mm. wide and 20 mm. thick. The lower long edge shows heavy wear. Example b. is 135 mm. long, 57 mm. wide, and 24 mm. thick. The lower right edge shows abrasive wear.

Large abrading knives approach twelve inches in length and are suitable for two handed operation. They have no provision for hafting as this would obstruct the cutting edges. The large examples sometimes have their ends unfinished or cortex covered. Some have complete perimeter cutting edges.

The pictured abrading knife from Kerr County (Fig. 1, c.) is a combination cross cut (pointed end) and planing or shaving (lower edge) knife. This example is 170 mm. long, 65 mm. wide, and 24 mm. thick. The principle wear is on each edge of the pointed half. Shaft shaving is indicated in the large concave edged flake in the middle.

Small, dart point sized abrading knives have stems for hafting, and are distinguishable from regular dart point types only by their asymmetry or by the presence of wear on their lineal edges that is evident. The abrading knife shown in Figure 1, d. is 190 mm. long, 80 mm. wide and 28 mm. thick. The edges show minutely small flaking that is evidence of use. This example is also from Kerr County. Projectile points receive little or no wear as tips for darts.

THE HAND HAMMER

This tool when used as a percussor in flaking stone, requires a special edge. Opposite the cortex holding end, the cortex is flaked off to expose the denser, inner material that is required of a hard hammerstone. This working edge is pecked down to remove any sharpness. The working edge is variable in length and shape and the cobble cannot be considered to have a blade. The edge is designed to prevent spalling of the cobble faces, or splitting, by directing the impact-compression and force lines toward the center of the cobble. Also, this edge permits the striking on small or limited platform areas. This type of percussor varies in weight according to the flake size desired. These especially designed percussors are nearly always made from flint or chert and are most numerous where the coarser grained quartzite cobbles are lacking.
FIGURE 1. Tools, probably used as abrading knives.
THE HAND CHOPPER

This tool has a cortex covered holding end with a roughly formed blade at the opposite end. The bit, or chopping end, shows the evidence of rough work by being dull, or dubbed blunt, from bone splitting, grubbing, etc. Some may represent wood cutting hand axes whose blades have been used to the point that they became too thick and short for such work, and were retained for more simple hacking work.

THE HAND PICK

This tool has a cortex poll or holding area. It is generally symmetrical in the form of a triangle. A definite point is directly opposite the poll and the lineal edges are essentially straight and of the same length. The blade is generally thick and coarsely flaked. The size ranges from that of heavy axes to medium sized dart points. Use, or wear evidence, appears mostly along the lateral edges near the point.

THE HAND AXE

This tool has more refined, thinner cutting edges than the choppers. Two forms are present. Form A. is made from a flat tabular cortex covered cobble. Opposite the cortex hand-holding end, a bit is formed that varies from lightly convex to rounding, but the sides are not worked lineally, toward the poll, to form a completely bifaced blade. Form B. is made from lozenge shaped cobbles and have completely bifaced blades. The lineal edges are convex to rounding and are irregular and cupped from a lack of finer, or secondary flaking. The bit generally has this secondary flaking that straightens the edge by removing the ridges between the primary flakes.

The hand axe was a general utility wood cutting tool. In this medium silica edges dull rather quickly, necessitating frequent re-sharpening. This erased any polish that would normally accumulate on the blade faces if the cutting edge remained sharp. New or little used specimens have wide blades, some of which approach being pointed. As they are used and re-sharpened, the blade becomes shorter and thicker. The open point becomes more rounded until the whole is too short and thick for wood cutting.

THE CARCASS-CLEAVER

This tool (Fig. 2, a. and b.) is the most refined of the cortex covered unaltered end, cobble tools. It is presently known in the literature as the fist, or hand axe. In order to understand why this tool that looks like an axe is not an axe, requires an explanation of the nature of silica materials, and what the design features of axe work require.
The cutting principle of a steel axe is that a deep penetration is made across the grain of the wood and at an acute angle to the length of the wood fibre. This compresses the fibres length, causing a chip to fly out, provided the fibres have been cut by a lower, previous strike. This angle of penetration is the flaking-angle of silica edges. Therefore, if the wood is hard grained, the silica axe will have its edge flaked on hard wood (which can be used as a billet or percussor). Silica axes must also be thicker than steel axes to prevent blade breakage above the cutting edge. Any prying sideways to loosen chips is, in effect, pressure flaking, and must be avoided. This applies to deep penetra-
tions also, because of the angle of entry through the hard and soft annual rings of wood. Chipped silica axes must therefore be strong bladed and the bit ends cannot be too thin. The tool must be of a highly expendable nature because it will not last very long.

The features that describe the carcass-cleaver knife in its used classical form, automatically remove the tool from the axe classification. The cobble selected had fine grained silica suitable for pressure flaking and sharp cutting edges. The cortex end conveniently fits the palm of the hand for a thrusting or pushing motion. The biface blade is flaked, and then it is additionally thinned. On the classic examples, this thinning results in concavities below the cortex holding area on each face, also one or both lineal edges will be concave from the additional thinning. A slight in-curve of the blade is present on some examples near the distal end. This is an impossible feature for a chopping tool, because it would allow impact forces to break the thin blades. The distal ends vary in shape from a near-point that is slightly rounding, to cutting edges that are almost straight, though short. Others have blades that are “U” shaped below the holding area. Most classic examples have fine pressure flaking along the extreme distal cutting end.

An additional feature of this distal end is that it is lineally straight, ridgeless, thin, and sharp. Sharp in spite of the fact that “use” has produced a polish on the faces that sometimes extends back more than an inch from the end.

I have determined from experiments that silica stone edges, when extensively used to cut earth, stone, bone, or wood, cannot remain knife-sharp sufficiently long to produce high polish extensively on the faces above the cutting edge. There is no wood soft enough in Texas that can be penetrated sufficiently deep to account for this polish on the carcass-cleaver knives. This tool had to be used in a soft non-abrasive substance.

The Edwards Plateau Aspect was a hunting and gathering culture. Sickle sheen is implausible because the polish is concentrated at the ends of these tools and because the balance, and the physical features, indicate that a thrusting or pushing motion is required for its proper use. A lack of fine retouch and consistent polish up the lineal edges supports this method of use. The sum of these cited features proves that this tool is a knife—not an axe. To demonstrate the type and justify the name carcass-cleaver, necessitates the introduction of some logic; logic that is based on the listed features.

I have not yet found a carcass-cleaver knife that was not on, in or within a very few feet of a burnt rock mound. This certainly associates
the tool with food preparation. Assume a deer sized animal has been brought to camp. The skin has been removed or laid open with flake, or other knives. The carcass is ready for division. Proper slicing is done to expose the ball-joint of a ham. The ham is raised to place the ball-joint under the proper strain. The knife is pushed in and through the outer edges of the joint until severance is complete. The back-bones are divided by bending, away from the thrust. This allows insertion of the knife’s leading edge in between the bones where tendon, sinew, and cartilage are cut with body weight exerted through the palm of the hand, pushing the knife between the bone segments. From this friction, polish accumulates above the leading edge.

As the back bone becomes too short for effective bending, attempts to pry the segments open for deeper penetration is evidenced by numerous carcass-cleaver knives being broken squarely across the blade about one inch above the leading end. Such breaks, when repaired, obliterate the major polish. Newer knives with little use, will show no polish. I recovered these broken distal ends at the burnt rock mounds. This is further proof that use was at the cooking center. Some are use-polished from about ¼ inch to 1 inch back from the cutting edge. This is about the average for this tool whether whole or broken.

A high-gloss shine is present on some very few specimens along an entire lineal edge to the cortex end. High-gloss is rare on an entire face but may exist. Some examples have had enough use that the higher ridges between the flake scars are rounded and worn but do not yet show polish.

The cortex end of this knife is a very necessary feature for its use as a carcass cleaver push-knife. This enlargement above the thinned lower blade allows a full solid grip for the hand to grasp. The cortex is, in most cases, of a porous texture and a bit rough (like coarse, but dull, sandpaper). This assures a non-slip grip for the hand, through which, force can be applied in what is normally a slick, bloody job.

There is little to review, in the literature of the past, concerning this knife that is called a fist axe. J. E. Pearce and A. T. Jackson (1933: 144) speaking of Southwest Texas say, “Fist axes of both regions are very much alike but show finer workmanship in Central Texas. E. B. Sayles (1935: 70) referring to his Plate XIX-a says, “Hand Axe, with finely chipped, thin blade from Edwards Plateau.” A. T. Jackson, (1938: 98–100) Fist Axes, Site No. 6 Llano County says “All are worked down to a fairly sharp cutting edge, but lack the delicate secondary chipping common to specimens from Edwards to Val Verde Counties. Length of No. 1 is 6 and ¾ inches. Note the large unworked areas at the upper ends.” A more recent reference is Leroy Johnson Jr.
(1961: 275) referring to two small Fist Axes notes “one has signs of secondary flaking.” Johnson (1964: 65) notes that “The blade was thinned by careful billet flaking near the tip.”

These past references to a “fist axe” verify many of the features of Cleaver knives that I have listed earlier in this paper. None, however, mention the classic forms (Fig. 2) that have developed a “heel” over the lineal concave edge that is opposite the straighter edge on some examples. This “heel” is heavy enough from its bulk to throw the artifact badly out of balance for use as a hand axe.

Is there another knife type in American pre-history with a similarly shaped blade that was enlarged at the holding end and was pushed into the work? The Eskimo “Ulus” of Alaska, and the Early Archaic Ulu of the New England region are of this type. The Ulu is normally made from slate—chipped, pecked, and ground into a thin, half-circular, blade. The blade expands in thickness at the top to form an enlarged area for holding that is sometimes flat on the top. The cutting edge is honed for sharpness. The shape and balance of the Ulus and cleaver knives are basically the same.

THE BILLET. AN INDISPENSABLE TOOL FOR BIFACING WIDE THIN FLAKES

References to the technology of tools, their processes and products, are becoming more frequently common in the analysis of the lithic sections of site reports that may not always be well grounded in fact or research. Specifically, references to billets, “the hammer and billet technique,” and the special flake attributed to this tool—the billet flake.

Site inventories have not provided us with adequate artifacts—examples of this tool—that we know its full range in form, size, materials, and applications. Crabtree (1967: 60–71) has provided descriptions and uses of the billet tool. My work with the billet tool has produced information that I believe is pertinent and additional to that now in print; and is information that places the billet in its proper place in the lithic tool kit. The following description of a billet is not one of an artifact, but one that fits me best for the medium to heavy work described in this text.

A billet is an antler main-beam from a large deer or elk, preferably, and should have all branching tines removed. It should include as much as possible of the bone between the skin-ring and the top of the skull, as this bone has the ideal density and hardness for low, or acute angle, percussion flaking. The tool is best when made from fresh killed animals, because the bone and antler dry out and become harder and more brittle with age. The length should be 12 to 16 inches
and the diameter (average) about 1 to 1 ¼ inches. Large tines are useful as billets but lack the inner density and the bonus quality of the bone between the skin-ring and the top of the skull.

The billet in use, is held like a modern nail hammer, but the swing is more stable if three or four inches extends behind the heel of the hand. The stone being worked, is held in the other hand—which is protected by leather from flying flakes and jar. A position should be assumed that is relaxed, wherein the billet may be swung in identical arcs with repeated precision.

The production of large flakes is primarily the product of large hard hammer-stones. The initial steps of bifacing the large flakes (reducing humps and very thick lineal edge areas) is the work of smaller and/or softer hammer stones. The flake is at this point, roughly bifaced, but with irregular lineal edges, cupped uneven facial areas, and with prominent flake scar ridges. These features are the normal result of bifacing with hand held stone percussors.

Additional work with stone percussors will not materially change the above conditions, because large platform areas are required for stone percussion. Continued use will also result in unnecessary loss of material width in maintaining these platforms. Hammer stone platforms must contact the hammer stone face to face, or about 90° to each other, to prevent crushing the platform. This required depth or angle inevitably results in biface edge-angles greater than desirable. The overhang of the hammer stone above the negative bulb on the biface damages this edge by the follow-through motion of the hammer stone. Because of hardness and relatively slow speed, the hand held hammer stone produces prominent positive and negative bulbs of percussion. Additional flakes of the desired length and thinness are impossible without first removing these negative cavities. The replatforming over these cavities also causes material loss of width to progress as fast, or faster than, the progress of thinning the biface. Obviously then, hammer stones are inadequate for producing wide thin bifaces with desirably acute edge angles.

Let us now consider the billet. The billet does produce flakes of a distinctive character that are straight, flat and thin, and, the tool was used for thinning. My research with the billet agrees that this is true, but that it is of secondary importance. It does not explain the prime uses of the tool! These are: 1. The execution of trimming and finishing flakes following initial biface roughly-out flakes by hammer stones; 2. The complete application of bifacing flakes on large flakes that are too thin to be bifaced with hammer stones. The working details are as follows.
Primarily, the billet is for percussion flaking from very narrow or thin platform edges, at angles more acute than is possible with hammer stones. This is possible for a number of reasons. There is little or no overhang of the platform as in the case of hammer stones. Platforms as narrow as one-sixteenth of an inch may be struck at biface edges that are at very acute angles. This is because the billet is slightly penetrated by the platform. The platform does not crush because the force is spread evenly along the penetrated billet end. The bone (antler) being softer than lithic material, crumbling or crushing is almost entirely eliminated. Deep negative bulb cavities are absent, because of the high speed delivery of the billet stroke and the thinness of platform area struck.

Very thin original flakes can be completely bifaced with a billet, and yet remain relatively broad, because of the small size and minimum of under cutting of the biface by the negative bulbs of percussion. The billet in this instance is irreplaceable because of the very acute angle of flake removal required and because the flakes must be longer and wider than pressure flaking permits. Otherwise, the broad thin flake can not be completely bifaced without being seriously narrowed.

Billet flaking is much faster and easier to perform on thinning and finishing bifaces than is indirect percussion flaking for these reasons.

1. Small punches (to prevent their ends from splintering or collapsing) must seat on deep platforms and face-up with the platform, as in hammer stone percussion. 2. Compaction and/or splintering of bone or antler punches results in hinged and broken flakes that ruin the biface. 3. Punches of larger diameter are best suited for blade making from large stable masses of stone. The increased diameter does not materially reduce edge failure of the punch. 4. Rounding of the punch end to strengthen it still does not eliminate the problem of the very thin edged, acute angled, biface edges penetrating and splitting the bone or antler punch.

Percussion flaking with bone or antler in bifacing is desirable over stone percussion also, because less shock is delivered to the biface. More pre-forms are therefore finished, rather than broken.

The processes of converting a large flake into a finished biface are not completely separate and distinct. A hammer stone may be needed to remove a certain flake in the midst of the billeting procedure. It is sometimes desirable to pressure flake a platform while the pre-form is in any stage. It is not always possible to separate hammer stone flakes, billet flakes, indirect percussion, and pressure flakes. Conditions in flint knapping exist where the “typical billet flake” is produced by all four methods. The requirements in each case involves a platform
that does not crush and fast undiminsihing force application to the platform.

Conversely, on large flakes that feather out evenly to sharp distal edges, the deepest negative bulbs possible to produce are the product of pressure flaking by leverage that is built up slowly until the flake is detached. The face below the positive bulb will be straight to concave. If the pressure is diminished or lost during detachment of the flake, the flake will shorten in length and the face below the positive bulb will be convex in the long axis.

The billet may be used to produce flakes with un-billet-like characteristics simply by slowing down the billet stroke, and striking platforms that have the angle, size, and depth designed for hammer stones. Positive and negative bulbs will be diffused somewhat, but the resulting flakes will appear to have been struck by a soft hammer stone.

The rules for successful billet flaking are few and simple. The important ones are: 1. Large, thin, straight flakes, require a very fast billet stroke; 2. To prevent hinged or broken flakes, facial and flake ridges that are concave (at the biface edges) must be rendered straight or convex before billeting the next row of flakes; 3. To prevent splitting or breaking of the pre-form, platforms must be lowered to the side or face of the proposed flake so that the material remaining above the proposed flake is thicker than the flake proposed. Otherwise, the flake will be a very short one, at a much greater angle to the lineal edge of the pre-form. The striking of platforms that are too thick, will generally result in a broken biface.

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Excavations at a Midden Circle Site
In El Paso County, Texas

JOHN W. GREER

ABSTRACT

A Type IB midden circle dates to the early part of the Jornada Branch period (A.D. 900). The occupation probably represents hunters and gatherers of the Jumano tradition (Livermore Focus?) in contact with the sedentary agricultural groups of the region.

INTRODUCTION

In December, 1963, I began a concentrated study of midden circles and mescal pits with a trip, recording sites in many parts of western Texas and southern New Mexico. During this time I was able to contact Vernon R. Brook of the El Paso Archaeological Society, who helped a great deal by taking me to meet some of the members of the society who knew of the existence of midden circles: John W. Green, John Hedrick, Tom Martin, Chuck Koerner, Earl Wood, and others. One person contacted at this time was Bill Kennedy (Antony, New Mexico), who gave the location of a midden circle just east of El Paso. The site was visited and recorded by Brook, Koerner, and myself the next day. At that time it was numbered TX-2 in accordance with the numbering system for midden circle and mescal pit sites recorded by me and was named the Pow Wow Site after a nearby arroyo of the same name.

In December, 1965, I returned to El Paso and tested the site using funds provided by the Department of Anthropology at the University of Texas. During this time I resided with the Vernon Brook family, and I would like to thank them for the many courtesies shown me during both my trips.

LOCATION AND DESCRIPTION

The Pow Wow Site is located about 27 miles east of the center of El Paso, one-fourth mile north of Highway U. S. 180 to Carlsbad, and about six miles south of Hueco Tanks, the well known pictograph area. It is just out of the western edge of the central Hueco Mountains on a relatively flat desert region with occasional small limestone hills. Pow Wow Arroyo, a large, dry wash, is approximately 300 yards south of the site. Numerous natural tanks are shown on the topo-
graphic map for the area and, no doubt, provided water for the early inhabitants. There is no water supply in the immediate vicinity of the site however. The site occupies the eastern and northern slopes of one of the low, rounded hills and stretches about 200 yards onto the flat sandy area beyond, at an elevation of approximately 4400 feet above sea level. Vegetation on the site includes abundant lechu-guilla, spider cactus, creosote bushes, and prickly pear. There is no sotol or any edible species of *Agave* in the immediate vicinity.

The site is composed of at least two midden circles, a number of heat-fractured limestone hearths, and various occupation areas of concentrated ash deposits and artifacts (Fig. 1). Midden #1 is a well-formed type IB midden circle (Greer, 1965: 44–45) with a maximum outside diameter of 33–36 feet and an inside or pit diameter of 12–14 feet. The midden is on a very slight slope, with the upper side only 0.4 feet higher than the natural ground level and the lower side 2.1 feet higher. The central depression varies in depth below the rim of the midden from a maximum of 0.3 feet. The hill slopes toward N 30° E, and the greatest deposits are on the downhill side of the midden, which has a nearly level top. The main part of the midden rim is composed of fire-fractured limestone rocks (about 3 inches in diameter), sand, and ash, while the central depression is almost purely a gray, sandy ash.

**Figure 1.** Sketch plan of TX-2, showing the relative position of features.
Midden #2 is about 120 yards north of Midden #1 and may not be a midden circle. It is so greatly eroded as to be simply a pile of rocks and ash about 22 feet in diameter and 7 inches high.

Midden #3 is about 30 feet south of Midden #2 and is another circle of burned rock, possibly a small midden circle 33 feet in diameter and about 6 inches high. The very slightly depressed central area is about 11 feet in diameter and at most only 3 inches deep.

Midden #4 is a small, Type IB midden circle near the eastern edge of the site and near a fence running almost north-south. The midden is 22 feet in diameter and a maximum of 6 inches high. The pit is 11 feet in diameter, a maximum depth of 3 inches, and is composed almost entirely of rock-free sand and gray ash.

Other concentrations of occupational debris occur in many areas of the site. Most of the rock concentrations or hearths are about four feet in diameter and 9 inches high. They are scattered around the general area of the middens, especially between the hill and the fence in the area of Midden #4. Most of the subsurface or living debris seems to be primarily on the hill sides, such as a large area just above and southwest of Midden #1. These living areas are full of fire-cracked limestone, ash concentrations, and a great deal of broken pottery and flint and agate flakes. No rooms or other living structures were observed and are presumably absent from the site.

**EXCAVATIONS**

In 1965 the site was revisited for the purpose of testing the largest midden circle (Midden #1) to determine its structure and cultural affiliation, and obtain a carbon sample suitable for radiocarbon dating. A trench 2.5 feet wide was laid across the midden, with one edge lying along the axis of the midden through the center. The trench was divided into 5 foot excavation units. Unit #4 was in the center of the central depression and was the first excavated. All material from this unit was screened through one-third inch hardware cloth and all artifacts collected. Because recent work at ring middens had discovered a paucity of charcoal in sites of this type, at first all charcoal was collected. However, it soon became apparent that there was much more charcoal than was needed, and only the larger pieces—those about one-half inch or more in diameter—were kept. Pollen and soil samples were also collected, but these have not been analyzed.

After Unit #4 was excavated into the sterile caliche underlying the midden, Units #3 and #5 were excavated to complete a profile across the central depression into the concentrated stones forming the ring. The deposits from these two units were not screened.
FIGURE 2. Profile through the center of Midden #1, looking east.
The profile of the excavated trench is quite simple (Fig. 2). At the surface there is a 3 inch layer of yellowish-tan, wind-blown sand which covers most of the site. Below this, extending to the basal, coarse sand, is a deposit of very fine and loose, light brownish-gray, sandy ash. On either side of the central depression is a deposit of medium-light to medium (compared to other midden circle sites) rock concentration, which bulges slightly into the ash a few inches from the bottom of the midden. This sloping of the concentrated rock is probably due to the rocks falling back into the central area after they had been piled up so high and does not seem to represent an intentionally excavated pit into the ashy material.

ARTIFACTS

A tabulation of artifacts is given in Table 1. These include ones collected during both visits to the site and those in the personal collections of Brook, Koerner, and Kennedy. Brook has in his possession a Harrell point, an Olivella shell bead, and an Enser point; Koerner collected a small, obsidian thumbnail scraper; and Kennedy found 3 dart points and a drill near Midden #1 and two arrowpoints on the midden. He also mentioned finding a large number of beads in the occupation area just southwest of Midden #1.

Below are comments on the artifact classes and types present at the site. Long, formal descriptions will not be given here, since most classes are commonly described in archeological reports for other areas. For most of the stone artifacts, see descriptions in Johnson (1964) and other reports describing materials from Val Verde County. Pottery types are adequately described by Hawley (1936) and Lehmer (1948).

Pottery (Fig. 3)

Alma Plain. This is similar to El Paso Brown, but the sand temper is much finer. The paste is an orangish-brown and the lip is burnished to a dark reddish-brown. The rim is direct or slightly tapering to a gently pointed lip.

Chupadero Black-on-white. These are olla body sherds with the characteristic heavy striations on the inner surface. Broad and narrow-parallel black lines were pointed on a heavy white wash or a thin watery slip as exterior decoration.

El Paso Brown. This plain brownware contains coarse sand temper of large white grains which show through both interior and exterior surfaces. The surfaces are generally orange to reddish-brown, but may
TABLE 1

*Distribution of artifacts from the Pow Wow Site. “x” denotes the presence of uncollected material*

<table>
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<tr>
<th>ARTIFACTS</th>
<th>Gen. surf.</th>
<th>#1 surf.</th>
<th>#1, excav.</th>
<th>#2 surf.</th>
<th>#3 surf.</th>
<th>#4 surf.</th>
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grade into gray, and the interior is often black. As previously mentioned by Lehmer (1948: 94) some of the interior surfaces have striations from smoothing with grass bundles. Firing clouds are common on the exterior, and one sherd bears a mending hole. No rim sherds were collected. An obvious characteristic of this type is the ease with which the surfaces erode, leaving the temper even more prominent.

A worked sherd of El Paso Brown has relatively fine sand temper and smooth surfaces. This is an olla body sherd and was used as a scraper, possibly during the manufacture of other pottery, as is so common throughout pottery-making regions. This small sherd is 23 mm. in diameter and 5 mm. thick.
El Paso Gouged. One jar body sherd has a coarse sand-tempered paste and a floated surface covered with a red wash. Small gouged-incised marks about 7 mm. long are arranged in horizontal rows on the exterior surface. The prominent temper suggests a placement late within the El Paso Ware (see discussion), and the surface treatment is somewhat reminiscent of El Paso Polychrome (painted) and Playas Red (both incised and gouged).

El Paso Polychrome. Five bowl sherds (three rim and two body) and 11 olla sherds (1 rim and 10 body) were recovered. These pre-
sumably appear fairly late within the El Paso Ware and are decorated on olla exteriors and on both surfaces of bowls. The dominant attribute of this type is the coarse, white sand temper which protrudes from the paste, especially on olla interior surfaces. The rims are slightly thickened-direct and the lips flat (Fig. 4). No flaring is present. The bowl rim sherds (probably from the same vessel) bear mending holes. Surface decorations include broad lines (ca. 6–13 mm. wide) of black and fugitive red and additional solid areas in black. On whole vessels which I have observed in various collections unpainted portions (primarily the lower parts of the ollas and the centers of the bowls) are greatly floated and have a dark rust color, as opposed to the common orange surfaces of El Paso Brown.

Playas Red. These sherds represent jars with quite hard paste containing finely ground sand temper. The exterior surface is finely floated to a natural reddish-brown or a dark rusty-brown polish. The surface may be either plain (simply floated) or slightly altered. Two sherds appear to have been gouged (such as the El Paso Gouged sherd) and then smoothed similarly to the Blind Indented utility ware of the glaze periods around Santa Fe (Museum of New Mexico material from the Cochiti area). Another sherd bears parallel, horizontal lines. The general appearance is that these bands are the original coil boundaries, which were not entirely smoothed, although the intervening area (i.e. the coil body) is highly polished. Upon examination, it appears that the surface was polished, then the bands were engraved-incised while the clay was still very slightly damp. No other incised sherds were found.
Type undetermined. One rim sherd is probably related to Playas Red. This slightly flaring, direct rim has a nearly flat lip and a highly floated, light, reddish-brown exterior. The floated surface does not appear dark enough for Playas Red. The brownish-gray paste is very fine and contains fine sand temper.

Another jar body sherd has the exterior finely floated to a dark gray. Although this surface is not the characteristic red of Playas, it is probably related to that type. The paste is orange with fine sand temper.

Beads

Olivella. One small, spire-looped shell bead was found by Brook on the surface near Midden #1.

Cut shell. A very small, centrally drilled, circular bead of white shell was found in the area just southwest of Midden #1. Kennedy (pers. comm.) reported finding many beads in this area during his digging.

Crinoid. Two light gray beads were made by breaking the casing of a marine worn fossil (Vermetus?) into sections. These are 9 mm. in diameter and the holes are 3 mm. in diameter. They were found in the same area as the cut shell bead.

Arrowheads (Fig. 5, a-e)

Triangular. Two plain triangular arrowpoints were recovered. One, made from a coarse brown material, is wide with straight, but crudely serrated, blade edges. It is 28 mm. long and 25 mm. wide. The second point, 23 mm. long and 14 mm. wide, is a narrow triangle with a slightly concave base and is made of white flint. This point fits the description of the Fresno type (Suhr et al., 1954: 498; Kelly, 1957: 46).

Harrell. A notched triangular point is tentatively identified as Harrell (Suhr et al., 1954; Suhr and Jelks, 1962). It may also be classified as Toyah (Ibid.) or Piedras Triple-Notched (Kelley, 1957: 46), although it may be slightly different from these two types. The point is triangular with a V-shaped base and sharp basal corners. There is a notch on each lateral edge not far above the base and one in the center of the base. The distal tip is broken, but the complete point was probably 28 mm. long. It was found on the surface about 50 feet northeast of Midden #1.

Livermore. Kennedy found this point and the next one at Midden
#1. It has a long, parallel-sided blade with short, flaring barbs. The stem is very slightly expanding and the base is rounded.

Although this point is considered here as representative of the Livermore type as pictured by Suhm and others (1954: 502), it could belong
to a separate type altogether. This type is found over a great deal of southern New Mexico and far western Texas. Work in midden circles at Carlsbad Caverns National Park produced many such points. These seem distinctive from the commonly mentioned Livermore points, such as the one pictured by Lehmer (1948: pl. 7, f) and others described by me (Greer, 1966c: 25–27). I have also previously followed Kelly Smith’s (1963: 187) Brewster County work by including contracting-stem points from New-Indian sites in Val Verde County in the Perdiz-Livermore group, a combined type, again differing slightly from the above styles. All of these points are different from the classic, cross-shaped Livermore points found by Janes (1930) in Jeff Davis County and described by Kelley (1957: 46) and Suhm and others (1954: 502). The Livermore type, as it now stands, at least should be divided into major varieties (e.g. contracting versus expanding stem, triangular versus cross-shaped outline) for descriptive comparisons and eventually distributional studies.

Type Undetermined. This point also is in the Kennedy collection from Midden #1. It is a small, thick arrowpoint, about 23 mm. long and 14 mm. wide at the shoulders. The convex blade edges are notched just above the square shoulders. The stem is contracting and the base is slightly notched.

Dart Points

Ensor. In the Brook collection is a short, thick Ensor point (Fig. 5, f) with wide, shallow lateral notches and a rounded base. The distal tip is broken, but the estimated length is 40 mm. This point was found near Midden #1.

Type Undetermined. Three points found by Kennedy have straight to slightly expanding stems and convex bases (Fig. 5, g-i). The barbs are strong to long, but not flaring. The blade edges are convex to recurved, convex at the shoulders and concave at the distal tip. The points range from 31 to 44 mm. long.

Fragment. One distal fragment of a large dart point of white flint had been ground smooth until the edges and point were rounded and the flake scars barely visible. This specimen (when whole) probably had religious significance, such as use in a medicine bag or for ceremonial functions. A. E. Dittert (pers. comm.) reports that at the Pueblo town of Acoma in central New Mexico, dart points, identified to types by their relative ages, are used by certain clan shamans during such practices as curing rituals.
Drill (Fig. 5, j)

A fairly thick drill was found by Kennedy on the surface of the site. The base is small and rounded, and the blunt shaft is parallel-sided with edges somewhat smoothed from use. The complete specimen is 47 mm. long. This appears more like a late Archaic type (possibly associated with the small dart points from the site) rather than Neo-Indian (pottery and arrowpoint associations), which is generally characterized by small, finely chipped blades (Ray, 1935: 77; Jackson, 1938: 98; and others).

Graver (Fig. 5, k)

A single flint flake is unaltered except for the sharpening of two small points by means of minute flaking. Such tools could have been used for engraving or, more likely, tattooing (see Beals, 1932; Ruecking, 1955: 359; Kelley, 1955: 983).

Scraper

A small obsidian flake end scraper (“thumbnail scraper”) was found by Koerner near Midden #1. It is circular, about 16 mm. in diameter, and finely unifacially worked around two edges.

Knives (Fig. 5, l-m)

The knives are generally bifacial, widely lanceolate to ovate in shape and crudely to sparsely chipped. They are made from fine-grained flint to fine quartzite-like material. Length ranges from about 35 to 55 mm.

Miscellaneous Worked Flint

Specimens in this group have one or more worked edges, but they do not possess any unique descriptive qualities for comparisons with other materials (such as scraper types). These artifacts are flakes, sparsely and crudely flaked to serve as scrapers, knives, and possibly other utilitarian tools.

Utilized Flakes

These small chert flakes have one or more edges with fine microflakes or use scars. They may have been used for cutting or scraping.

Blade-Flakes

These are elongated flint flakes, sometimes called “bladelets”. Their length is greater than twice the width, and they range from 28 to 49 mm. long and 12 to 17 mm. wide. They bear no use marks and ob-
viously represent flaking residue (many workers in Texas would simply place blade-flakes with the rest of the unaltered flakes). I include the separation of these objects as an aid to present research by both myself and others.

Unaltered Flakes

Flint. Unaltered flint flakes are generally fairly small—under 40 mm. in diameter. The following flint (fine-grained chert) types are present: black, bluish-black, all shades of gray, green and purple (same stone), brown translucent, white, and pink. Flakes of pink-orange agate were also found.

Limestone. These flakes are larger, usually over 50 mm. in diameter. The specimens in this group range only from 50 to 65 mm. in maximum dimension and up to 20 mm. thick. Specimens from other sites in western Texas (Brewster, Jeff Davis, Hudsbeth, and El Paso counties) and southern New Mexico (Eddy County) are often larger and much more abundant.

Large Flint Tools

These are primarily core tools, probably used as small choppers or scraping planes. There is one percussion-flaked edge on each, and two specimens were additionally used as hammerstones. They are about 64 mm. in diameter and 23 to 49 mm. thick.

Limestone Tools (Figs. 6 and 7)

These are both core (or cobble) tools and large flake tools, probably used primarily as choppers, scraping planes, crude saws, and large knives. Each specimen has at least one crudely worked edge. There is one unifacial chopper, three bifacial choppers, two bifacial knives ("mescal knives"?) flaked along one long edge, and an elongated adz. The last tool is very steeply beveled on one end, and the lower, ventral planar surface is ground smooth, probably from use. These limestone tools range in length from about 93 to 163 mm. The thicknesses and shapes vary, as might be expected, due to the nature of the material.

Pebbles

Two small pebbles were found on the surface. One is limestone with fine-grained green chert-like material at one end and a core of brown flint. The second specimen is an obsidian pebble which appears to have been battered somewhat. There is a burin-like chisel edge at one end that may truly be a utilized burin. The coal-like opaqueness suggests that this specimen is of local origin, as it seems that this type of
obsidian is not found in the central and northern portions of New Mexico. Bill Kennedy (pers. comm.) reports that the high gravel terraces of the old Rio Grande channels used to be full of obsidian.
pebbles which recent mineral collectors have made somewhat scarce. Both specimens are 25 mm. in diameter and are intrusive to the site.

**DISCUSSION**

The Pow Wow Site apparently represents a multi-occupational area dating within the time of the Jornada Branch of the Mogollon (see Lehmer, 1948). The site is located on the desert flats barely out of the central Hueco Mountains and at what appears to have been a favored camping place. Midden #1 and the occupational deposits immediately to the southwest of the midden probably represent the earliest occupation as indicated by the dominance of El Paso Brown pottery. The small, so-called dart points and the stemmed arrow-points are probably products of this occupation. Middens #2 and #3 are apparently later and account for nearly all of the El Paso Polychrome and Playas Red and all of the Chupadero Black-on-white.

The dates from two carbon samples taken from Unit #4 seem quite reasonable in light of pottery associations. The dates, released by the
Radiocarbon Laboratory of the University of Texas (Valastro et al., 1968), are A.D. 990±80 (Tx-363) and A.D. 840±60 (Tx-364). Although the dates from this split sample should have been identical, they agree that the midden dates ca. A.D. 900. This would also strengthen the hypothesis that the midden dates before the introduction of Chupadero Black-on-White (ca. A.D. 1050) and El Paso Polychrome (somewhat later).

In all likelihood the site was occupied by small groups of hunters and gatherers like the Jumano, who spent much of their time in the mountain areas hunting wild animals and gathering and roasting sotol and/or agave (mescal). They were obviously in close contact with the sedentary agriculturalists of the area as shown by the abundant pottery in midden circle sites. Obsidian and western shell beads from the Gulf of California were probably obtained via the Jornada Branch villages. Whether the nomadic groups lived and traded with the local villages, as Lehmer (1960:126) points out from early sources, or raided the villages in this desert-sand dune region and then returned to their mountain country with the loot, is unknown.

The middens at the site, particularly middens #1 and #4, appeared on the surface as Type IB midden circles (Greer, 1965: 44–45)—mounded, circular accumulations of hearthstones with a wide, shallow depression in the center. Excavation in the central area of Midden #1 confirmed its structure as a midden circle, as it lacked the subsurface pit necessary for mescal pit middens (Greer, 1967).

At this point I would like to suggest a slight change in the nomenclature for the middens in which I have been working. In 1963 I made an extensive (though definitely not intensive) survey of sites conforming to the then common term “midden circle”. A typology of such phenomena resulting from the survey and from voluminous correspondence was published two years later (Greer, 1965). At that time (and subsequently) a midden circle was designated a specialized accumulation of debris resulting from a surface hearth, while mescal pits were evidence of a pit-cooking (earth oven) technique. Thus, the variations in midden structure was thought to have cultural implications (Greer, 1967).

Before these distinctions can be made, however, there is a necessity for more field work in order to judge with some certainty the internal structure of a burned rock midden from its surface characteristics. Probably no one would ever confuse a deep, stone lined Type VA roasting pit of the Casas Grandes style in Chihuahua, Mexico, with a Type IA “midden circle” in the Guadalupe Mountains of southern New Mexico. But, on the other hand, one would not be able to ascertain
definitely whether the people who built the large annular pile of burned rocks had done so through a process of pit baking or by scraping broken stones away from a simple hearth; or whether the people began cooking in an above-the-surface earth oven and dug successive pits only after a substantial amount of midden material had accumulated.

The inadequacy of our present knowledge has led to the term “ring midden” for the type of doughnut-shaped structure appearing as a ring of mounded hearthstones, ash, or a combination of these surrounding a depression of almost rock-free gray ash. “Ring midden” will be used to signify a particular form with an unknown function. When the function is ascertained through excavation (sub-surface pits are occasionally, but rarely observable before excavation; the lack of a stone-lined pit is never known), then the terms “midden circle” and “mescal pit” can be used with some meaning and for the purpose of cultural reconstruction. Eventually we should be able to predict sub-surface structure of various middens (e.g. certain styles of Type I midden circles and mescal pits), but such predictions will be possible only after detailed excavations at a number of sites of each variation.

It seems that a problem confronting workers in the Jornada area, especially around El Paso, is the classification of some of the pottery types. It is quite apparent from viewing such collections as the El Paso Archaeological Society material from the Hot Springs Site (to pick but a single example) that the Chihuahuan material needs to be re-worked and broken down into a number of new types, especially the plain wares. Perhaps something of this sort will come from the current work at Casas Grandes by C. C. DiPeso of the Amerind Foundation.

The description of El Paso Brown has always been somewhat confusing. The type is defined by Lehmer (1948: 94) as occurring with a variety of surface treatments and with the painted styles giving way to El Paso Polychrome. If it is true, as it indeed seems to be, that El Paso Brown originated as a local variation of Alma Plain, first in plain form, then with simple pointing, and later with polychrome designs (as a new type), then the stages of development should be designated.

The earliest brownware in the Jornada area is apparently Jornada Brown, a finely burnished ware with polishing marks. The walls are thicker and the paste is much more compact than the later types. This type apparently has been found stratigraphically earlier than other brownwares (discussed below) at a small site near Hatch, New Mexico (Curtis Schaafsma, pers. comm.; see Schaafsma, 1965). Next came Alma Plain, a coarser, sandier type, probably from the area west and northwest of El Paso. In the El Paso area, Alma Plain evolved into a coarsened form with large sand temper and came to be what is now
known as El Paso Brown. As time passed, the temper became more prominent and the paste more friable. Surface decorations were added, such as the application of a red wash and gouging (probably a crude copy of Playas Red and Playas Incised) or even painting with either red or black lines on the brown surface (likely the influence from the Chihuahuan and Hopi areas). Eventually the ware came to be realized as vessels with a highly floated (though not attaining a polish) surface with polychrome designs in black and fugitive red.

Following a suggestion by the El Paso Archaeological Society (n. d.) I am proposing that the present El Paso Brown be divided into El Paso Brown (with relative age, designated by the abundance of tempering material, duly noted in any descriptions, e.g. El Paso Brown, varieties fine and coarse), El Paso Gouged, El Paso Punched (see Lehmer, 1948: 94), El Paso Black-on-brown, and El Paso Red-on-brown. Next would be El Paso Polychrome. These types could be put into a unit designated El Paso Ware or, if one preferred, the El Paso Series, originating from a single cultural group in duration over a moderate length of time and important enough to show their influence in such distant areas as the northern part of the Texas Panhandle (Watts, 1963).

Another problem in the archeology of the West Texas area is the relationship of the small, side-notched dart points to the arrowpoints. Such is the case at the Pow Wow Site, where one Ensor point and 3 small points similar to Guadalupe points (Greer, 1966c: 30) were found on the site with abundant El Paso Ware and a few arrowpoints (Livermore, Harrell, and Fresno). It seems that these small dart points occur on every midden circle site thus far examined, including all apparently single occupation Neo-Indian sites. Such occurrences suggest that the dart points and the arrowpoints were in part contemporaneous and in direct association (e.g. Greer, ms). Dibble (1967: 34) also has pointed out that the “liberal admixture” of the side-notched Ensor points with the smaller arrowpoint styles is at least suggestive of a degree of contemporaneity in his extraordinarily well-stratified Arenosa Shelter at the mouth of the Pecos River in Val Verde County. I might also suggest that both sizes were probably used on arrows, as it seems to me unlikely that a group would use both the bow and the atlatl.

This hypothesis seems quite reasonable with reference to various ethnographic data. Spier (1928: 151), for instance, mentions that the Havasupai of northern Arizona (who also have the mescal pit type ring middens) used arrowpoints 3 to 6 cm. long (well within the limit of the small dart points). The shorter points were used with reed shafts and the longer with solid wooden shafts of willow. We, of course, do
not as yet know how the late dart points were hafted in western and southwestern Texas. It is interesting, however, that ring middens seem to have come into the area with the introduction of the side-notching tradition (Ensor-Frio period of Val Verde County area, Greer, 1966a, 1966b: 15). It may be that a migration of people brought with them the introduction of the bow, as well as special cooking techniques applied to local foods.

More ring midden sites in the area of El Paso should be excavated and the sites carefully studied. Only in this way can we hope to determine both the cultural affiliation of the ring midden sites and the relationship between the Jumano (or Livermore Focus) of the El Paso area and the Jornada Branch with its strong Chihuahuan connections. More data are also needed from this area for a complete evaluation of ring midden sites in western Texas and southern New Mexico.

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The University of Texas
Austin, Texas
Report on Excavations at the Field Ranch Site  
(X41CO-10) Cooke County, Texas  

Harald P. Jensen, Jr.

ABSTRACT

Two eroding hearths were excavated on the Field Ranch Site in West Central Cooke County, Texas. Surface collections and excavation produced tools and lithic refuse which relates technologically and lithologically to early points found there previously.

PREFACE AND ACKNOWLEDGMENTS

The Anthropology Research Center of Southern Methodist University was contacted during March, 1967 by Butch Guerin, of Nocona, Texas, concerning a site in Cooke County. The Field Ranch Site (X41CO-10) is eroding out of the bank of a small conservation lake on the upper reaches of the Elm Fork of the Trinity River in Cooke County, Texas, within the construction area of Soil Conservation Project No. 5, a proposed dam and lake complex some eight miles southeast of Saint Jo, Texas.

The Field Ranch Site was visited twice by Southern Methodist University field parties, and extensive surface collections were made. Two concentrations of material were noted and hearth stones were seen eroding from these areas. Materials from the locale included several Paleo-Indian projectile points.

A change order was negotiated with the National Park Service to provide for excavation. A field team under the direction of Dr. Edward B. Jelks tested the site during the second week of May, 1967.

A number of individuals provided assistance and cooperation during excavation at the site. H. D. Fields granted us permission to work on his property and Doc Welsh, the ranch foreman, his son, Guy Welsh, and Butch Guerin, allowed the study of their artifact collections from the area. Jon Gibson assisted in the excavation and recording of data at the site.

R. King Harris, Tony Marks, and Joel Shiner, of the Anthropology Research Center, offered advice and criticism during analysis of the collections from the site. Marcia McGee and Linda Smith prepared the illustrations for this report.

ENVIRONMENT

The area is characterized by gently rolling limestone hills covered
with native bunch grasses. The creeks which intersect the region are permanent and dense vegetation and tree stands are present along them. Cooke County falls within the Texan biotic province described by Blair (1950: 100–102). A small portion of the flora and fauna may well have been utilized by earlier site occupants; these include wild plums, large mouth bass, bullheads, bluegills and bull frogs. Rabbits, waterfowl, quail, and deer are quite common in the area.

GEOLOGY

The geological situation at the Field Ranch Site is similar to that seen at road cuts in the area.

Zone II

The uppermost geological member in the area consists of two facies. Zone IIc is a poorly developed humic zone, averaging 15 cm. in depth. Zone IIb is a buff to gray brown sandy silt with some humic content. The zone averages 1 m. to 2 m. in depth and a great deal of caliche is weathering out of its exposed faces. Zones IIb and c may have been deposited as outwash from nearby hills surrounding this area. It is suggested that Zone IIa clays originate from the weathered sandstone below (Bob Slaughter: personal communication).

Zone I

Zone I, the basic bedrock member, consists of a white, fairly coarse sandstone extending down for an undetermined depth. This sandstone is part of the Travis Peak Formation of the Lower Cretaceous described by Sellards (1966: 310–319).

EXCAVATION PROCEDURE

Extensive surface collections were made along the bank. Material from these collections was probably associated with the two exposed hearths and possibly others which may have completely eroded out. The approximate limit of each hearth was blocked out and the matrix around the exposed hearth stones was removed. All tools, debitage, and additional hearthstones were left in place for photographing and recording. Detailed plans of the excavations were plotted from surveying stakes placed by the United States Corps of Engineers, the hearths were later recorded on a Corps of Engineers map for the area (Fig. 1).

THE FEATURES

The hearths were situated at the contact between Zone IIa and IIb,
Figure 1. Field Ranch Site.
on top of the red clay. The hearths were 100 meters apart. A filled in stream channel, which had cut through the red clay into the Zone I white sands, separated them. It could not be determined whether this channel pre-dated or post-dated the occupational features.

Excavation showed that one of the hearths exposed in the bank of the lake had been almost completely disturbed by erosion and the other was only partially disturbed. Neither of the hearths showed any evidence of fire, there was no charcoal present and the clay showed no discoloration.

Hearth 1 (Fig. 2)

Hearth 1 is an almost completely disturbed hearth at the northern end of the bank. Fine washlines beneath the hearthstones indicated that they had been moved out of place by erosion; several flakes in and around the feature were in undisturbed matrix. The hearthstones and associated material were concentrated in an area about 1 m. east-west and 2m. north-south. The material associated with the hearth includes 1 tool and 6 flakes.

![Figure 2. Sketch of Hearth 1.](image-url)
Hearth 2 (Fig. 3)

Hearth 2 was eroding out of the southern margin of the lake bank and was only partially disturbed. While several hearthstones had washed silts beneath them, several were found resting on undisturbed red clay. The feature encompassed an area 1 m. east-west and 3 m. north-south. Materials associated with this hearth include 3 cores, 2 tools, a chunk, and 2 flakes.

MATERIALS RECOVERED

The bulk of the material found at the Field Ranch Site, unfortunately came from surface collections. A few tools and a fairly large amount ofdebitage was recovered.

Dart Points

Midland Point: (1 specimen, Fig. 4 a)
FIGURE 4. Points: a, Midland; b and d, Folsom; c and f, Plainview; e, Edgewood; g, Clovis; h, Hell Gap-like. Actual size.
Description: A well-made bifacially chipped lanceolate point, the flake scars are symmetrical and in general conform well with specimens described from the Midland Site (Wendorf et al.: 1955). The point is basally and laterally ground, and made of gray chert.

Dimensions: Maximum length: 49.6 mm.; maximum blade width, 16 mm.; maximum thickness, 5 mm.; basal width 15.9 mm.; depth of basal concavity, 1 mm.

Provenience: Surface, Guerin collection.

Folsom Point: (2 specimens, Fig. 4, b and d)

Description: Neither of these points are worked as carefully as specimens from the type site Folsom, New Mexico (Wormington 1957: 23–25). They are somewhat asymmetrical; flake scars are fairly irregular, and thinning scars are not as long or broad as on examples from Folsom, New Mexico or the Lindenmeir Site in Colorado. Both specimens are basally and laterally ground, one is made of a uniform gray chert (Fig. 4 d), the other of a white patinated chert (Fig. 4 b). The gray colored point has been reworked laterally from about midway to the distal tip. This subsequent work has modified the thinning scars on both faces, and the general outline now appears truncated rather than recurved.

Dimensions: Gray reworked specimen, maximum length, 34.9 mm.; maximum width, 18 mm.; maximum thickness, 5.7 mm.; basal width, 18.3 mm.; depth of basal concavity, 3 mm. White specimen: Maximum length, 31.5 mm.; maximum width, 18 mm.; maximum thickness, 5.4 mm.; basal width, 16 mm.; depth of basal concavity, 1 mm.

Provenience: Surface (2), Guerin collection.

Plainview Points: (2 specimens, Fig. 4, c and f)

Description: This type is represented by the basal portions of two points. Both were made of gray chert and have a series of basal thinning scars similar to those found on some of the Plainview Site specimens (Sellards, Evans, and Meade, 1947: 928–952). Basal and lateral grinding is present.

Dimensions: Specimen in Figure 4, f, maximum length, 18 mm.; maximum width, 23.6 mm.; maximum thickness, 6 mm.; basal width, 20.4 mm.; depth of basal concavity, 2 mm. Specimen in Figure 4, c, maximum length, 14 mm.; maximum width, 24 mm.; maximum thickness, 7 mm.; basal width, 23.3 mm.; depth of basal concavity, 3 mm.

Provenience: Surface (2), Guerin collection.

Clovis Point: (1 specimen, Fig. 4, g)

Description: The specimen is a basal portion of a large Clovis point
made of a fine textured white quartzite. The fragment is bifacially worked, has the typical broad flutes or thinning scars on both faces, and is basally and laterally ground.

Dimensions: Maximum length, 19.5 mm.; maximum width, 32 mm.; maximum thickness, 8 mm.; basal width, 34 mm.; depth of basal concavity, 1.5 mm.

Provenience: Surface, Guerin collection.

Edgewood point: (1 specimen, Fig. 4, e)

Description: Edgewood points were first described by Suhm, Krieger and Jelks (1959: 418–419). The Field Ranch point has an expanding stem and is made of buff-gray chert. The tip is damaged, and the edges are slightly irregular to concave base.

Dimensions: Maximum length, 28 mm.; maximum width, 22.8 mm.; width at base, 14.8 mm.; depth of basal concavity, 1.5 mm.

Provenience: Surface, Guerin collection.

Hell Gap-like: (1 specimen, Fig. 4, h)

Description: A long, slightly contracting stemmed point made of gray chert. The blade edges are convex and symmetrical; rather weak shoulders are present at the blade-stem juncture, and the base is slightly concave. The point has a lenticular cross section and very uniform bifacial chipping. This specimen is similar in most respects to the Hell Gap Points described by Agogino (1961: 558–560), except for basal concavity which the Wyoming specimens do not have.

Dimensions: Maximum length, 66 mm.; maximum width, 25 mm.; maximum thickness, 6 mm.; width of base, 14.3 mm.; depth of basal concavity, 2.5 mm.

Provenience: Surface, Welsh collection.

Gouge: (1 specimen, Fig. 5, d)

Description: A trapezoidal shaped, bifacially worked tool showing use polish on its ventral surface. The dorsal surface is convex giving the specimen a plano-convex cross section. The narrower end of the specimen is convex; the wider end is roughly convex, but has two large flake scars which give it a slightly irregular appearance. One lateral edge is concave, the other convex; all four edges of the tool were formed by steep percussion flake removal from the ventral surface. The tool is made of buff caliche encrusted chert.

Dimensions: Maximum length, 28 mm.; maximum width, 29 mm.; maximum thickness, 13 mm.

Provenience: Surface
Figure 5. a, Graver; b, c, and f, Denticulates; d, Gouge; e, Convex Side Scraper. Actual size.
Convex Side Scraper: (1 specimen, Fig. 5, e)

Description: This tool is made of a chunk or slab of tabular white fine grained quartzite. Cortex remains on both surfaces. The scraping edge is convex and characterized by steep unifacial percussion flaking.

Dimensions: Length, 64 mm.; width, 48 mm.; thickness, 26 mm.

Provenience: Surface.

Graver: (1 specimen, Fig. 5, a)

Description: A graver point or bit was made on a secondary cortex flake. About 50% of residual cortex remains on the outer surface; no bulbar or platform retouch is present. The distal end, opposite the bulb of percussion, is retouched to form a “beaked” tip or graver point. This unifacial modification is represented by two oblique truncations, one on the distal end of the flake and parallel with the striking platform. The other is a transverse truncation on the flake’s cortex bearing side. Both truncations are slightly concave thereby accentuating the graver tip. The tool is made of white chert.

Dimensions: Length, 30 mm.; width, 18 mm.; thickness, 4 mm.; length of graver tip, 2 mm.

Provenience: Surface.

Denticulates: (3 specimens, Fig. 5, b, c and f)

Description: Two of these tools are made on irregularly shaped chunks of white chert. The third specimen is on a gray chert cortex flake. The three denticulates have at least one retouched edge. The natural or non-prepared flat surfaces on these tools were used as striking platforms for the removal of a series of shallow percussion flakes at fairly regular intervals thereby forming a toothed or jagged edge.

Dimensions: Figure 5, c, Length, 24 mm.; width, 25 mm.; thickness, 15 mm. Figure 5, b, Length, 34 mm.; width, 27 mm.; thickness, 16 mm. Figure 5, f, Length, 44 mm.; width, 42 mm.; thickness, 13 mm.

Provenience: Surface (1), Hearth 1 (1), Hearth 2 (1).

Hammerstones: (2 specimens, Fig. 6, d and f)

Description: Fairly smooth, oval quartzite pebbles, with edges that show battering. Both specimens have a large amount of battering at their opposed ends.

Dimensions: Specimen in Figure 6, d, length, 80 mm.; width, 48 mm.; thickness, 44 mm. Specimen in Figure 6, f, length, 81 mm.; width, 67 mm.; thickness 38 mm.

Provenience: Surface.
Cores: (6 specimens)

Single platform lisse: (2 specimens Fig. 6, a and c)

Irregular chert chunks, on which a striking platform was prepared by removing a single large flake. A series of flake scars extend down from the lisse or flat platform on both specimens.

Provenience: Hearth 2.
Single platform cortex: (1 specimen Fig. 6, b)
A series of flakes were removed from an unprepared striking platform on this quartzite cobble.
Provenience: Surface.

Informe: (2 specimens)
Irregular chert chunks with flakes removed in a nonpatterned manner. It appears that any convenient surface was used as a striking platform throughout the removal of flakes on this specimen.
Provenience: Surface.

Isolated Flake Core: (1 specimen, Fig. 6, e)
An oval quartzite pebble that has had one large flake removed. One edge of this flake scar is considerably smoothed, possibly by cutting or back and forth movement.
Provenience: Hearth 2.

Cortex flakes: (7 specimens)
Description: Flakes which retain 50% or more of original cortex on their outer surface. One white chert flake in this class was utilized; materials include quartzite (2), white chert (4), and red chert (1).
Provenience: Surface.

Flakes: (95 specimens).
Description: These specimens retain striking platforms and bulbs of percussion, but have little or no cortex. Seventeen of this class are made of a fine grained white quartzite and of these 13 are *eclat de taille* or biface thinning flakes, one of which has use retouch. Fifty-five of the remaining chert flakes are also biface thinning flakes and one of these also shows use retouch.
Provenience: Surface (90), Hearth 1 (3), Hearth 2 (2).

Chips: (49 specimens)
Description: Chips are the broken portions of cortex flakes and flakes which have no striking platform or bulb of percussion. Twelve of these chips are made of quartzite and one of these has steep unifacial retouch along one edge. None of the remaining 37 chert chips have retouch of any kind. Thirty of the chips are from broken biface thinning flakes.
Provenience: Surface (47), Hearth 1 (2).

Chunks: (15 specimens)
Description: This category includes broken chert cores and other
pieces of chert which cannot be placed into a tool or tool making by-product category, and are essentially unidentifiable chipped stone fragments.

Provenience: Surface (13), Hearth 2 (2).

DISCUSSION

Seven early points including Clovis, Folsom, Midland, Plainview, and Hell Gap-like were found at the site; the sample includes four complete and three basal sections. The convex side scraper, denticulates and the utilized isolated flake core together with numbers of sharp little flakes probably served as butchering tools. The graver and gouge were probably wood and bone working tools, and perhaps were used specifically for making dart shafts. The two hammerstones, the cores, and numerous flakes all argue for work of a non-food processing sort. From a total flake sample of 151 pieces, 98 were complete or fragmentary biface thinning flakes. These flakes are the by-product of manufacturing bifaces and especially thinning them. The size of the biface thinning flakes from the site essentially reflects point manufacture; materials from which the Field Ranch points and tools were made is lithologically the same as much of thedebitage and stone refuse.

Surface materials represent a geological rather than cultural association and therefore may represent more than one occupation. The presence of an Archaic dart point at Field Ranch Site suggests visits to the area by later hunting groups. Notched points have been reported in early contexts by Agogino and Frankforter (1960: 414–415) and Sellards (1940: 1637 and 1642), however, and we cannot rule out entirely the possibility of the Edgewood points origin in a pre-Archaic context.

The materials and architectural features indicate that a range of activities were conducted at the site; the presence of cores, hammerstones,debitage, bone and wood working tools, and scraping instruments suggest that the site represents a base camp for tool manufacture and food preparation. However, the presence of points from different chronological horizons would suggest differential use of the site at different times. As such, it may represent a hunting station also. The limited amount of material would argue for short, intermittent occupancy.

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Texas Archeological Salvage
Southern Methodist University
Dallas, Texas
Paleo-Indian Artifacts from Sites Along San Miguel Creek: Frio, Atascosa and McMullen Counties, Texas

THOMAS ROY HESTER

ABSTRACT

A number of probable late Paleo-Indian projectile points have been collected from eight sites along San Miguel Creek, in Frio, Atascosa, and McMullen counties. These artifacts are described and illustrated in this paper; the Angostura, Plainview, Plainview golondrina, Meserve, and Milnesand types appear to be represented. Archaic and other non-Paleo-Indian artifacts from these sites are tabulated and briefly described.

INTRODUCTION

San Miguel Creek is formed by the confluence of Black Creek and Cat Creek in east-central Frio County, about 50 miles southwest of San Antonio, Texas. From its headwaters, it flows over a 45-mile course through eastern Frio, southwestern Atascosa and northern McMullen counties; it roughly parallels the Frio River, which it joins near Calliham in McMullen County (see Fig. 1). While the entire creek has not been systematically surveyed, a number of sites have been recorded along the central part. In 1954, Dr. T. N. Campbell’s Anthropology 340 class (from The University of Texas) recorded several sites in southeast Frio and southwest Atascosa counties, most of which were exposed by gullying and sheet erosion along both sides of San Miguel Creek. The collections gathered at that time are stored at the Texas Archeological Research Laboratory (T.A.R.L.) at Austin. In recent years, William Stanton, Jr. (of Corpus Christi) has collected from site 41 AT 10, on San Miguel Creek in southwest Atascosa County; he has graciously made materials from this site available for study. In McMullen County, Mr. and Mrs. J. L. Tunnell located a large site (41 MC 1) near the town of Cross, along the southern side of San Miguel Creek. The collection made by Mr. and Mrs. Tunnell is also stored at T.A.R.L., and a detailed report on it is in preparation (Hester, MS, “Archeological Materials from Three Areas of Southwestern Texas”).

The sites thus far recorded along San Miguel Creek have predominantly Archaic artifact assemblages. The various classes of artifacts found at the sites are discussed briefly and are listed in Table 1.
FIGURE 1. Archeological Sites along San Miguel Creek. Sites are grouped in areas. Area 1 includes sites 71 A4-1 through A4-3; Area 2 includes sites 41 AT-3 and 41 AT-4; Area 3 includes sites 41 AT-7 and 71 A9-1; and, Area 4 contains site 41 MC-1.
Other Artifacts from San Miguel Creek Sites. Paleo-Indian projectile points are not included.

<table>
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<tr>
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FIGURE 2. Group A projectile points. Dashes indicate extent of smoothing.
In addition to the Archaic materials, a number of possible late Paleo-
Indian projectile points have also been found. It is the purpose of this 
paper to describe these probable Paleo-Indian materials and to discuss 
some of the problems posed by them.

DESCRIPTION OF THE SPECIMENS

Twenty-three Paleo-Indian projectile points are described and both 
faces are illustrated. While most of them fit rather easily into pre-
viously described types, they have been sorted into descriptive groups, each of which has been given a letter designation. Within each group, the specimens are described, and the dimensions, material of manu-
facture, workmanship, and provenience are given; there is also a dis-
cussion of the type each group most closely resembles. Detailed mea-
surements (in millimeters) are given for each specimen, using these 
symbols: L: length; MW: maximum width; BW: basal width; and, 
MT: maximum thickness. The abbreviation “PROV.” is used to indi-
cate the site provenience of the specimens. Incomplete measurements 
are enclosed in parentheses; if the measurement is an estimated one, the abbreviation “est.” will appear. Some of the sites are designated 
according to the trinomial system employed by The University of 
Texas; for example, the site designation 41 AT 10 indicates that the 
site is in Texas (41), in Atascosa County (AT), and is the tenth site 
recorded in the county. Other sites, where detailed location and de-
scriptive data are lacking, retain the quadrangle designations formerly 
used by The University of Texas; 71 A4–1 is an example.

GROUP A

No. of specimens: 9 (all fragmentary)

Outline form: Most are basal fragments; the more complete speci-
mens have lanceolate outlines. Bases are concave on six specimens, 
and straight on the others. The distal end of one specimen may have 
been alternately beveled, but it is damaged and this cannot be de-
termined with certainty. Another specimen has been reworked into a 
 drill (Fig. 5, c,c’); its lateral edges are somewhat damaged. Lateral 
 edge smoothing (near the base) is present on seven of the specimens, 
and the extent of smoothing is indicated in Figs. 2 and 5.

Materials: All are made from flint (or chert). Colors include 
translucent brown (2), light tan to cream (4), mottled gray (1), 
and light brown (2).

Workmanship: Horizontal flaking is present on four, with finely 
executed oblique flake scars on another. Flaking is irregular on the 
other four specimens. Marginal retouching is evident on six of them.
Basal thinning has been accomplished by the removal of short, vertical flakes on all specimens.

Discussion: These specimens fall within the range of the Angostura type, as defined by Suhm, Krieger and Jelks (1954: 402). Some could be included in the type as described by Hughes (1949: 270), Wheeler (1954: 4) and Wormington (1957: 269).

GROUP B

No. of Specimens: 5 (1 complete, 1 nearly complete, 3 fragments)

Outline form: They are lanceolate, with edges almost parallel near the base, and then curving toward the distal end. On all specimens, the widest part is near midsection. The basal edges are markedly concave on two specimens, and only slightly so on the others. The lateral edges near the proximal ends are smoothed on all specimens, and the basal edges are smoothed on two.

Materials: All are made of flint, with colors varying from light gray (2) to light brown (2) and dark brown (1).

Workmanship: Three exhibit very skillful chipping, with horizontal to slightly oblique flake scars. The other two also show some parallel chipping, but are less well-made, perhaps due to the quality of flint used. Short vertical flakes, often crescentic or arc-shaped, have been removed in thinning the base of each specimen. Fine marginal retouch is present along the lateral edges of most specimens. One specimen,
which exhibits extremely fine workmanship, has the distal portion of the blade reworked into a drill shaft (Fig. 3,e,e').

Discussion: These specimens can be placed in the Plainview type,

GROUP C

No. of Specimens: 5 (1 complete, 4 fragmentary)

Outline Form: These points have lanceolate outlines; the lateral edges near the proximal end are straight (or slightly concave) and almost parallel. The basal edges are markedly concave. The basal corners are slightly flared on three specimens, and are more widely flared on the other two. Basal thinning was accomplished through the removal of short, vertical flakes forming a lunate pattern of flake scars (see Johnson, 1964: 49). Maximum width occurs at midsection on one specimen and at the base on the others. Edges are well-dulled near the base.

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<td>19.5*</td>
<td>21.5</td>
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* Maximum width of the blade. On these specimens, the actual maximum width occurred at the base.

Material: Flint of the following colors was used in the manufacture of these specimens: tan, pinkish-tan, mottled gray, mottled gray-brown, translucent mottled brown.

Workmanship: Neat horizontal flake scars are present on two specimens, while flaking on the others is irregular. The blade on one specimen has been reworked to a crude point (Fig. 4,c,c'). A burin-like facet is present at the break on one edge of another specimen (Fig. 4,a,a'), but this seems to be the result of impact, rather than an intentional blow. One specimen has been damaged by thermal-fracturing.

Discussion: Johnson (1964: 47–52) has defined the golondrina variety of the Plainview type, and the specimens described here appear to be good examples of that variety. He attributes the golondrina specimens found at the Devil's Mouth Site (in Val Verde County, Texas) to a “Late Paleo-Indian” occupation. Johnson also presents some distributional data on golondrina (pp. 49–52).

GROUP D

No. of Specimens: 3 (2 complete, 1 nearly complete)
Figure 4. Group C and Group D projectile points. a, a'-d, d', Group C; e, e'-f, f', Group D. Dashes indicate extent of smoothing.
Outline form: They have lanceolate outlines, with straight (nearly parallel) edges near the base. The basal edges are deeply concave. The parallel edges at the proximal end extend approximately one-third of the way up the blade (maximum width occurs at that point), where they then converge toward the distal tip. The blade edges on all three specimens are alternately beveled along the right edge. The basal corners flare slightly on two specimens (as in the case of Group C), but are not flared at all on the third. Lateral edges near the base are smoothed.

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<td>20</td>
<td>6.5</td>
<td>41 AT 10</td>
</tr>
</tbody>
</table>

Materials: The specimen illustrated in Fig. 5 (a,a') is made from a banded grayish flint; the tip has been restored by Mr. Stanton. The other two specimens are made from tan and grayish-white flints.

Workmanship: Flaking near the base is good, but the blades are rather crudely chipped, having a reworked appearance on two specimens. Flake scars are irregular. The bases on two are thinned in the manner of Group C; short, vertical flakes have been removed from the base of the third.

Discussion: The Meserve type, described by Davis (1953: 384), Suhm, Krieger and Jelks (1954: 450) and Wormington (1957: 265) include specimens similar to the ones described here. Two of the projectile points described here (Fig. 4,f,f'; Fig. 5, a,a') might represent variants of the Plainview golondrina type; the other (Fig. 4,e,e') may be a reworked Plainview specimen.

GROUP E

No. of Specimens: 1 (nearly complete)

Outline Form: Lanceolate in outline, this projectile point has convex blade edges and a slightly convex base; the distal tip is missing. Maximum width occurs near midsection. Lateral edge smoothing is light, but extends about half-way up the blade from the base.

<table>
<thead>
<tr>
<th>Dimensions:</th>
<th>L.</th>
<th>MW.</th>
<th>BW.</th>
<th>MT.</th>
<th>PROV.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 5,b,b'</td>
<td>(65) est.</td>
<td>20</td>
<td>15.5</td>
<td>6</td>
<td>41 AT 10</td>
</tr>
</tbody>
</table>

Material: It is heavily patinated, but probably was fashioned from translucent brown flint.
FIGURE 5. Group A, Group D, and Group E projectile points. a, a', Group D; b, b', Group E; c, c'-d, d', Group A. Dashes indicate extent of smoothing.

Workmanship: Oblique flake scars cover both faces. There seems to have been an attempt at reworking the distal tip after it was broken. The base is thinned by a series of short, vertical flakes on both sides, making the base almost wedge-shaped in cross section.

Discussion: This specimen bears much resemblance to the Milnesand type, as described by Wormington (1957: 265) and Bell (1958: 54), though it seems to be somewhat more narrow than specimens from the type site (Sellards, 1955: Figs. 98–100).
OTHER ARTIFACTS FROM SAN MIGUEL CREEK SITES

The author has briefly studied the non-Paleo-Indian artifact assemblages from eight San Miguel Creek sites. There are a variety of dart points represented, including stemmed types reminiscent of Edwards Plateau and Trans-Pecos cultures (Suhm, Krieger and Jelks, 1954: 53, 108) and unstemmed forms found commonly in southwest Texas (Weir, 1956: 62–72; Nunley and Hester, 1966: 249). Tortugas occurs at all of the sites; other major types include: Abasolo, Bell, (Sorrow, Shafer and Ross, 1967: 12–14), Enson, Fairland, Langtry, Lerma-like, Pedernales, and miscellaneous unclassified expanding stem dart points. Minor types found at the sites are listed in Table 1. Arrow points are very rare; Perdiz was found at one site, Scallorn at another, and Fresno-like (triangular) at still another.

However, projectile points are a small part of the artifact assemblages examined from these sites. When all eight sites are compared, there seems to be a great deal of uniformity in the assemblages, and this is reflected primarily by the non-projectile point artifacts. Unifacial gouge-scrapers, called Clear Fork Planer-Gouges by Ray (1941: 154), and by the local name of Dimmit scrapers by Nunley and Hester (1966: 238) were found at the sites as were bifacial gouge-scrapers (Ray’s Clear Fork Gouge 1, 1941: 153). Often these tools were found in large numbers. Other common items are heavy crude choppers and core-choppers, triangular knives, a type of gouge with the local name of Guadalupe or Attwater, ovate knives, unifacial scrapers made on cortex flakes, lanceolate knives, and a series of thick lanceolate, bipointed tools exhibiting both bifacial and unifacial flaking. Several scrapers with trapezoidal outlines, bifacial flaking and a single steeply-beveled edge were found at two sites. The name of Nueces scraper has been suggested for this tool (Hester, unpublished manuscript).

While most of the dart points probably represent Archaic occupations, and the arrow points possible Neo-American habitation, it is impossible to determine with certainty the age or cultural affiliation of the non-projectile point artifacts with our present data. We can speculate that the bulk of these artifacts might be attributable to Archaic peoples, but some may be representative of earlier cultures. Foremost among those of possible Paleo-Indian age are the unifacial and bifacial gouge-scrapers. Epstein (ms.) has presented evidence that at least some Clear Fork-like gouge-scrapers appeared “during terminal Pleistocene times in North America”. However, both the bifacial and unifacial varieties occur widely on Archaic sites in southwest Texas (Weir, 1956: 62; Nunley and Hester, 1966: 249; Hester, 1967b: 6–7)
and it seems probable that they were used during much of the Archaic period.

SUMMARY AND CONCLUSIONS

Five groups of projectile points have been described and illustrated. The groups appear to be stylistically representative of the following Paleo-Indian types: Angostura, Plainview, Plainview golondrina, Meserve, and Milnesand. These specimens occurred on the surface at sites along San Miguel Creek in Frio, Atascosa and McMullen Counties in southwestern Texas; they were accompanied by numerous artifacts primarily attributable to Archaic occupations.

The possible late Paleo-Indian affiliation of the types mentioned above has been suggested by many sources (Hughes, 1949; Davis, 1953; Wheeler, 1954; Suhm, Krieger and Jelks, 1954; Sellards, 1955; Wormington, 1957; Johnson, 1964). Since the specimens discussed here did occur in what seem to be predominantly Archaic sites, several questions are posed. Do the Paleo-Indian projectile points represent earlier (late Pleistocene) groups who camped at or near the same spot later occupied by Archaic peoples? Did the Archaic inhabitants pick up the Paleo-Indian points as curios or as sources of material? Or, were these late Paleo-Indian forms made and used during the early stages of the Archaic period in this area? These questions and other problems presented by the presence of Paleo-Indian artifacts in Archaic contexts have been discussed at length by Suhm, Krieger and Jelks (1954: 104–106) in regard to central Texas. In southwest Texas (which includes Frio, Atascosa, and McMullen Counties), the author has recorded numerous Plainview (and Plainview golondrina), Angostura, and Meserve specimens (Hester, 1967a: 3–8; ms., “A Distributational Study of Paleo-Indian Projectile Points in Texas”). Most of these occurred at large Archaic sites. Interestingly, Folsom and Clovis points found in the same region also generally occur in an Archaic context (Weir, 1956: 72; and, Hester, 1968: 117; “Paleo-Indian” ms.). Since these early Paleo-Indian styles are found in this situation, it would seem that either the Archaic peoples camped at (or near) previous Paleo-Indian camping areas, thereby causing their materials to become mixed through erosional processes, or the Archaic inhabitants were occasionally picking up the Paleo-Indian points and bringing them to their camps. The latter suggestion may account for the fact that some of the Paleo-Indian specimens in the area have been reworked into drills.

The non-Paleo-Indian assemblages at the San Miguel Creek sites contain artifacts found in both central Texas and southwest Texas
Archaic site: (Suhm, Krieger and Jelks, 1954: 108, 139, 141; Weir, 1956: 61–72; Nunley and Hester, 1966: 294). Tortugas is the dominant dart point type, but numerous stemmed and unstemmed points are also found. The greatest uniformity is found among the non-projectile point implements. Unifacial and bifacial gouge-scrapers are abundant, as are various forms of knives and scrapers.

At the present, the author does not know of an isolated Paleo-Indian campsite in southwest Texas (as described by Suhm, Krieger, and Jelks, 1954: 134, and which consists of the counties of Frio, McMullen, Atascosa, LaSalle, Zavala, Maverick, Dimmit, Live Oak, Jim Wells, Jim Hogg, Brooks, Starr, Hidalgo, Zapata and Webb); the Paleo-Indian specimens reported from the area thus far were found either at random or on Archaic sites. Since discrete Paleo-Indian components have been found in adjoining regions (Alexander, 1963; Johnson, 1964; Dibble, 1968), it is to be expected that they will eventually be found here.

ACKNOWLEDGMENTS

The author would like to thank Mr. Harry J. Shafer, of the Texas Archeological Salvage Project, for providing useful comments concerning this paper, and for photographing a number of the specimens. Mr. Charles Gallia also provided assistance with the photography, and Mrs. Lynda Hester typed the manuscript.

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Suggestions to Authors

MAXINE AND JOEL SHINER

The ideas, hints and principles discussed in this article are presented partly because they will make the work easier for the editor and partly because they will help authors to communicate with their readers. Most of these suggestions are quite standard for publication. There may be some controversial ideas in the sections on classification and interpretation, but, it is our firm belief that these are the modern trends in anthropology.

In your typed manuscript underline those words or phrases that you wish to appear in Italics in print. If you want them to appear underlined in print, then you must so indicate in the margin of your manuscript.

Illustrations are difficult and they involve a number of minor problems. First of all, while the Bulletin page size is 6 x 9 inches, the printed area is 4 5/16 x 7 inches. If the picture or map is upright, the 7 inch dimension must include the caption. If the illustration is wider than long, then it may be printed sideways on the full page. A third way is to use a partial plate which is 4 5/16 inches wide and less than 7 inches high. Ordinarily, the plates are made up considerably larger than life and are reduced by the printer. This process is especially good on maps and other drawings, as it tends to diminish any shakiness in the line work. If a plate is to be reduced to the effective page size of 4 5/16 x 7 inches, then the original size should be one of the following:

- 5" x 8 1/2"
- 6" x 9 3/4"
- 7" x 11 3/8"
- 8" x 13"
- 8 5/8" x 14"

Essentially, most of the photographs received by the editor have been quite good. There are a series of accepted standards or at least standard operating procedures in the illustration of artifacts.

1. Points usually are shown with the bases down and the tips up.
2. Scrapers and other tools are shown with the bulb of percussion (or striking platform) down.
3. Cores are shown with the platform up, though many Texas cores show multiple platforms.
4. Cross lighting on the picture should come from the upper left, so that the shadows are on the lower right side of the artifacts.
There are two main difficulties in the photography of artifacts. The first concerns the illustration of very light and very dark artifacts in the same plate. This serious problem becomes almost insurmountable when one does not have his own darkroom. The answer then is to take separate shots at different exposures and cut out the artifact with scissors or knife. This is rarely necessary since a good photographer and printer can capture most artifacts on the same plate. A substitute scheme for very white artifacts is to paint the surface with opaque water colors or tempera. So what if the final picture shows the artifact a little darker than life.

The second major problem in artifact photography is shadows in the background. If one has a light table the problem is minimized. If not, the picture may be taken close to a window with light (not direct sunlight) coming across the artifacts from upper left. The artifacts and the unobtrusive scale are placed on clear glass with a white background spread a foot or two below the glass. This technique permits one to use the whole print and not go through with the scissors procedure which often as not nips off serrated edges.

It is always a good idea, if you cannot have custom enlargements made, to send your negatives along with the manuscript. Also, in the case of maps and drawings, send in the original, not a photostat.

Standard procedure should be followed in the analysis of artifacts. One should not introduce new type names into the literature unless he can satisfy three conditions.

1. This type has not been named and described satisfactorily by someone else. If minor adjustments are made in the description, a new name is not warranted.
2. The description includes accurate temporal and geographic limits for the distribution of the type.
3. There should be some scientific purpose in naming a new type and not just a desire to see one’s own name associated with a new type.

If you have an artifact which does not “fit,” it is better to describe it than to give it a geographical type name.

In general, we have a workable system of local names for projectile points and pots. There is a serious theoretical problem, however, in giving place-name terminology to such tools as scrapers, knives and gouges. Even if the first prerequisites of naming were met, I would still ask why one would want to burden the world with another named type. There is a perfectly adequate system of dealing with scrapers, and it includes the use of such names as side, end, and transverse plus such descriptive adjectives as straight, convex etc. The classification
has worked quite well for years just about everywhere and each reader knows quite well what each writer means in terms of shape and process of manufacture. I am sure that similar descriptive terminology could be used for gouges, knives and other tools.

A graph is a dramatization of a statement of significance. In an age where we are accustomed to seeing distortions of fact or meaning through the use of statistics on television, let us not be tricked by the same thing in archeology. An example of the worst sort of the meaningless statistic is the bar or other graph that expresses percentages of specimens in each of four levels when there are only 8 or 10 total specimens. Unless there is a significant number of specimens this presentation is pure distortion.

The next problem is a little different from the others although it again deals with terminology. There are several terms in the southwest that seem to have multiple meanings. I doubt that anything can be done about it but the word blade has so many meanings that each author had better explain his own meaning. The editor prefers the meaning of a long, parallel sided piece that is detached from a core. Knife is a word that has been abused almost as much as blade. There is no hope of establishing much agreement except that it is a group of things and the word should never be used as a taxonomic type. A primary flake is a cortex flake and nothing more. An artifact is something made by man and it may be a flake, a core or a tool. The word does not refer only to points, scrapers, drills and so on.

A site report should deal with all of the recovered material, not just the tools, and especially not just the projectile points. Probably it is true that in most of Texas, projectile points are the single most valuable asset in assigning a site to a focus, and in establishing a sequence (of projectile points), but other artifacts must be reported as well. Chips, flakes and cores are equally symptoms of behavior. It is the duty of the archaeologist to at least save all of the artifacts even if he has not the training to classify them.

The most difficult section of an archeological report is the conclusions. A summary is easy, but only the original excavator can really do the job of making conclusions. The average report goes too far or not far enough in saying something about the people that occupied his site. A deduction that the site belongs to a specific focus is not a conclusion, nor is a decision regarding its temporal position. One of the simplest of conclusions would be remarks on how the people solved their problems of making a living, observing their particular customs, and how they got along with their neighbors.

One should not stretch the data. A report I have read told of finding
two pottery types in a pithouse and concluded that it was a meeting of two cultures. Another concluded that because there were points normally associated with two foci, there had to have been two occupations of the site. Beware of migrations bringing new Indians with a new point type. Beware of the exceptionally complex explanations of situations.

In summary, typology should be a tool that is used to pry information out of your data, especially the artifacts. One should not make classification his goal, nor should one be led around by his nose by his typological system. The aim of a site report is to communicate to interested persons what it was that you found and what you think it all means. In this case typology is used because there are too many specimens to permit individual illustration and description. At the next step up, dealing with placing your site in a larger framework it is not enough to classify it into its (proper?) focus or aspect. You are obligated to say something about the people.

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Three small shell middens on Cedar Bayou near Galveston Bay in Southeastern Texas were tested as part of a continuing archeological program of the State Building Commission of Texas. An initial survey had previously indicated the presence of these and several other sites in the area. With the pressing danger of destruction by industrial expansion, it was decided to investigate some of these sites with the hope of accumulating more data about this little known area of Texas. Consequently, a two week period in the spring of 1967 was spent in limited test excavation.

The amount of artifactual material recovered was small; certainly a reflection of the quantity of dirt actually moved. The combined yield of the three sites totaled less than 5,000 artifacts, of which over 4,200 were potsherds. Stone, bone, and other clay artifacts were present in minimal quantities. Surprising was the lack of mention of any shell artifacts. Over 87 percent of the cultural material came from the Wright Site (41 HR 50) which proved to be the most prolific of the three and which, consequently, received the most attention.

The report is essentially descriptive, and as is customary in such studies, analysis and interpretation are held to a minimum. The environmental setting is discussed in some detail, but no attempt is made to isolate specific biotopes nor to relate the sites to the physiography. This section would certainly have benefited by an awareness of relevant geographical-archeological work done by McIntire (1958) and Saucier (1963) in adjoining areas of the Louisiana Coast.

The limited amount of time available for excavation greatly restricted the quantity of data collected. No evidence of house patterns, hearths, or other features (except for two "pits" which may have only been natural depressions) was unearthed. The significant result of the digging was a sample of potsherds which may prove to relate to an early ceramic tradition of Southeastern Texas. This utilitarian sand tempered ware is stratigraphically and absolutely the earliest pottery thus far found in Texas, but it apparently had an extremely long temporal range of perhaps two millennia.
As far as I am aware, there has been little effort on the part of workers in this area to deal with the decorative attributes of such wares other than to simply describe them. Although I definitely favor technological analysis of ceramics, I feel that the “limited time” available for analysis of salvaged materials could perhaps be better spent investigating stylistic changes in decoration, which have elsewhere proven to be the most sensitive indicators of a continually dynamic cultural milieu. Certainly separation of pottery classes on the basis of temper, especially sand with its tremendous temporal span, can tell us next to nothing about cultural preferences or processes. I am not maintaining that certain extreme cases of temper do not show a preference on the part of the individual potter or perhaps even style whims of a local or extended group, but until we can demonstrate that sand was intentionally added as temper by analysis of local clay sources, it seems more feasible to concentrate on other attributes.

Artifacts other than potsherds were rather scarce and nondistinctive. Some stone projectile points—dart and arrow point types, stone tools—a drill and retouched and use-retouched flakes, and bone tools—socketed projectile points, awls, ulna tools, bipointed objects, fish-hooks(?), and smoothed antler and bone pieces constitute the artifact inventory. This assemblage is not diagnostic in terms of outlining discrete cultural or temporal units. However, it is useful in conjunction with the identified faunal remains in indicating that the makers of these tools were active in exploiting several microhabitats.

Floors of the trenches and of the isolated test units were lowered in arbitrary 10 centimeter levels. Ambler indicated that this caused some problems in correlating levels in different units, but acknowledged that it “did not unduly inconvenience the interpretations.”

Underlying the pottery-bearing levels at all three sites were layers of Rangia shell which may relate as Ambler has suggested, to a pre-ceramic occupation. However, paucity of artifactual material in these levels certainly negates a conclusive statement. Higher in the stratigraphic sequence after a “haitus” marked by a more or less discernible layer of sterile clay at all the sites were additional shell accumulations predominately Rangia with small quantities of oyster. However, site 41 HR 59 contained far more oyster in this level than the other two sites, which may indicate that this layer accumulated during a period of deteriorating environmental conditions, i.e., increasing salinity due to subsidence or sea level encroachment. In either case, it is possible to postulate that this level does not correspond in time to the two other stratigraphic sections, and from the greater percentage of sherd tempered pottery it appears that occupation here was somewhat later.
Capping most areas of these middens was a soil or depositional layer probably originally sterile of aboriginal artifacts but now mixed with modern trash by recent pot-hunting activity.

If we can project the data accumulated by McIntire (1958) in his survey of coastal Louisiana into the Cedar Bayou area, it appears that the environmental conditions revealed by the faunal aggregate more nearly correspond to those encountered on the Louisiana coast during the Troyville to Plaquemine span, ca. 800–1300 A.D.

Ambler compares the Cedar Bayou ceramics to other sand tempered wares from Southeastern Texas. I question his choice of treating the potsherds of all levels of all sites as a single block of comparative data. Even considering the infancy of the state of knowledge about this area of Texas, such a decision is not in the direction of clarifying areal, temporal, and intersite relationships.

Sites producing similar pottery are discussed. Twelve miles northeast of Cedar Bayou at Wallisville Reservoir are a series of sites investigated by Harry Shafer (1966). A large number of radiocarbon dates have shown that the earliest pottery, a predominantly plain sand tempered ware with apparent Tchefuncte affinities, first appeared about 150 A.D. It continued relatively unchanged until ca. 500 A.D. when incised decorations seem to have been introduced. Ambler suggests that the Cedar Bayou pottery is more indicative of the post-500 A.D. Wallisville material than of the earlier ceramics. Comparisons with Goose Creek and Rockport wares from the Addicks Basin (Wheat 1953) about 40 miles east of Cedar Bayou, indicate a similar degree of correspondence. Similarities are also noted with the sand tempered type, Bear Creek Plain (Jelks 1967: 3–7), which is the common “early” type of the area around McGee Bend some 100 miles inland from Cedar Bayou. The upshot of Ambler’s discussion is that there appears in Southeast Texas a long-lived, sand tempered pottery continuum which is distinctive from the sherd or bone tempered “Caddoan” ceramics.

Judging from the illustrations of the pottery from the Wright Site, I am inclined to agree with Ambler’s post-500 A.D. dating of this material and would even suggest a post-1000 A.D. assignment. The decorative motifs can be duplicated in collections from practically contiguous areas to the east in Louisiana, from Pecan Island (Wauchope 1947: 186–188) to Bayou Cutler (Kniffen 1936: 407–422). Inspiration for this set of designs certainly came from the late Coles Creek “complex” of the delta and coastal region of Louisiana. The entire range of decoration is most characteristic of the ill-defined transitional period between Coles Creek and Plaquemine after Floridian
influences (as seen in French Fork Incised and Pontchartrain Check Stamped) appear to have lessened and before Moundvillian connections were established. Extrapolating from a group of radiocarbon dates assembled by McIntire (1958: 107), this appears to have occurred sometime during a span from 800 to 1590 A.D. and most probably about 1200 A.D. Allowing for time lag, it is supposed that the Cedar Bayou occupants were incising similar designs on their pots somewhat after this date.

Although Ambler does not specifically refer to site function, it is evident from the raw data that the sites were living areas, probably occupied seasonally by small groups of semi-nomadic hunters, fishers and gatherers. Ambler's references to inconsistency of cultural strata within the sites or within one set of squares, the generally separate accumulations of refuse, and the vertical mixing of cultural material even to the point of being able to partially reconstruct vessels from varying squares and levels, all point to the probability of light intermittent occupation with considerable accompanying soil disturbance. That the sites were not just hunting camps is evident from the artifact assemblages which include not only weapons and tools, normally associated with the typical masculine pursuit of hunting, but also such articles as pottery and bone bodkins ordinarily considered to represent feminine handicrafts. Since site areas were not delimited nor were house patterns, hearths, or functionally-specific use areas uncovered, the size and implied social organization of the occupant groups remains questionable. Economic orientation was certainly geared to the exploitation of several microenvironments. Faunal remains attest to activity in various paludal zones such as marine bays or tidal flats (oyster), brackish estuaries (Rangia), and fresh-water distributaries (turtle, alligator, gar, drum). Economic attention was also channeled into other less moist biotopes such as the wooded natural levees where deer and a variety of small animals (raccoon, rabbit, squirrel, opposum) were taken and coastal prairies which provided bison, gopher, and cotton rat. It is probably safe to assume, although there is no direct evidence, that considerable use was made of various vegetable, fruit, and mast crops from each of these zones. In essence, this group of sites appears to have functioned as more or less intermittently or seasonally occupied base camps from which forays were extended into diverse ecological areas in quest of subsistence.

These sites are valuable in that they have furnished additional evidence about a little-known area, period, and ceramic tradition of Southeast Texas. The existence of this unique tradition has only
recently been acknowledged by Texas archeologists, and growing concern has been delegated sites in this area endangered by industrial installations, reservoir projects, and land-clearing operations. Such must justify the simple amassing of data and indeed of salvage archeology itself. When and if comprehensive syntheses of this portion of Texas are written, the Cedar Bayou sites will certainly play an important role in the elucidation of the culture history.

The very nature of salvage archeology in most cases negates adequate sampling, and hurried publication often precludes the full utilization of the collected data. Ambler is to be commended for his report, considering the limitations within which he worked. Certainly excavation of natural strata where possible would have assisted in stratigraphic interpretation if only to provide a test for corroboration. The possibilities for ceramic analysis were by no means exhausted by Ambler, and the full implications of the complex of decorative motifs were not realized. The comparative studies likewise suffered by not including pertinent data which have been collected by workers in the areas to the north (Marshall, Texas) and east (Louisiana Gulf Coast) of Cedar Bayou.

The quality of the report is generally good. Type is uniformly clear, but poor reproduction has blurred the location map and several of the graphs of pottery distribution. Justification of bottom margins would certainly have added to the overall appearance. More careful editing would have undoubtedly eliminated some of the wordiness especially evident in the section of "Acknowledgments", and perhaps reduced some of the grammatical and typographical errors. However, these factors are relatively minor when compared with the potential usefulness of this report as a source of data. It is certainly to be recommended to those archeologists interested in this particular region, as it represents one of the initial steps toward the understanding of the archeology of Southeast Texas.

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The Bulletin of the Texas Archeological Society publishes original papers in the field of American archeology. Emphasis is placed on Texas and adjoining areas in the United States and Mexico, but papers on other areas are also acceptable.

Manuscripts should be typed on 8½ by 11 inch sheets of white paper, and ALL MATERIAL should be double spaced. Footnotes should be avoided or kept to a minimum.

Reference to published literature, by author, date, and page or figure number should be placed within parentheses in the body of the text, with full bibliographic citations listed at the end. See this issue of the Bulletin for models.

The proportions of full-page illustrations should be suitable for reduction to Bulletin page size (effective page size 4¼ x 7 inches), allowing space for captions at the bottom. Captions for illustrations should be listed in numerical order and placed behind the list of references cited.

Each paper must be accompanied by an abstract (one or two paragraphs summarizing the main points of the paper). The abstract should be submitted as the first part of your paper.