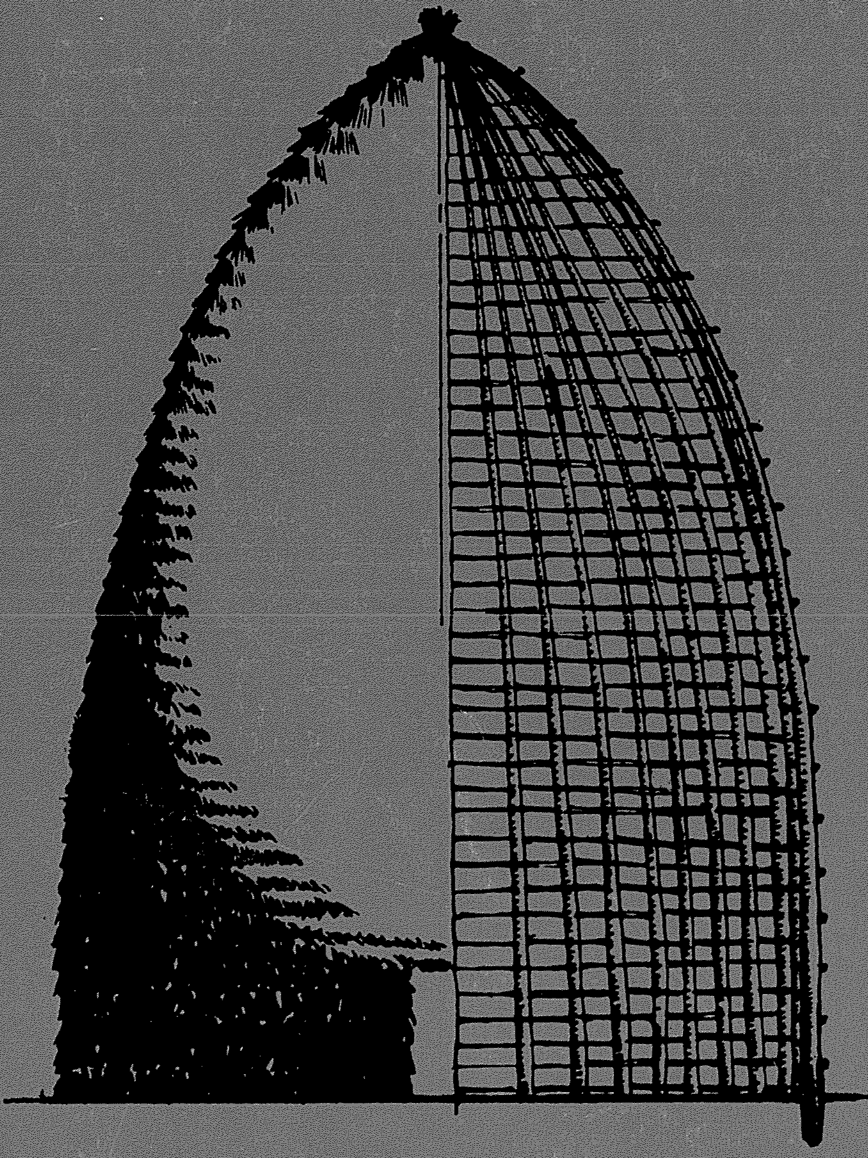

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BULLETIN of the TEXAS ARCHEOLOGICAL SOCIETY

TEXAS ARCHEOLOGICAL SOCIETY

(Formerly Texas Archeological and Paleontological Society)

The society was organized and chartered in pursuit of a literary and scientific undertaking; for the study of the history, pre-history and the major artifacts of man and the fossils representing the past floras and faunas of Texas; for the encouragement of the proper collection and preservation of such artifacts and fossils in museums and their study and classification and the publication of the results of researches incident thereto.

The *Bulletin* is published annually for distribution to members of the society. Opinions expressed herein are those of the writers, and do not necessarily represent the views of the society or the editorial staff.

Officers of the Society for 1959

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BULLETIN

of the

TEXAS ARCHEOLOGICAL SOCIETY

Volume 30, for 1959

Published by the Society at Austin, Texas, 1961

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Proceedings of the Fourth Conference on Caddoan Archeology

Edited by E. Mott Davis

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Introduction

A CONFERENCE of Caddoan archaeologists took place at the Louisiana State Exhibit Museum in Shreveport on Saturday and Sunday, April 13 and 14, 1957. The conference was initiated by Edward B. Jelks, who made the preliminary arrangements and drew up a tentative agenda. C. H. Webb took care of local arrangements, and H. Brainerd Wright of the Museum, our host, kindly provided space in the room where the Poverty Point diorama is being constructed. Webb acted as Moderator for the sessions, and E. Mott Davis was elected Secretary. The Conference took the form of an informal roundtable discussion, with specimens and reference volumes ready at hand.

HISTORY OF THE CADDOAN CONFERENCE

Systematic archaeology in the Caddoan area is relatively recent, most of it having been carried on within the last twenty-five years.[1] A number of conferences of Caddoan archaeologists have taken place in the latter part of this period, but until the meeting reported here, nothing approaching a formal institution was set up. Although the specific titles of these conferences varied, they shall be referred to here as the Conferences on Caddoan Archaeology, or Caddoan Conferences for short.

The First Conference on Caddoan Archaeology grew out of informal discussions during the 1940's at the home of Clarence H. Webb in Shreveport, Louisiana. This first formal meeting was "The First Symposium on the Caddoan Archaeological Area," held at the University of Oklahoma in Norman in September, 1946. At this three-day meeting the several archaeological complexes in the area were described by those most familiar with them, and their relationships with one another and with materials in neighboring areas were discussed.[2]

The Second Caddoan Conference was held at Dr. Webb's home in

[1] Krieger gives a brief summary of the systematization of Caddoan archaeology in Suhm, Krieger, and Jelks (1954: 151–161).

[2] Published résumés of the first three Caddoan Conferences have appeared as follows:

First Conference: Alex D. Krieger, "The First Symposium on the Caddoan Archaeological Area," *American Antiquity*, Vol. 12, No. 2 (January, 1947), pp. 198–207,

Second Conference: A brief note by Krieger appears in Suhm, Krieger, and Jelks, 1954, p. 160.

Third Conference: Robert E. Bell, "Caddoan Area," *American Antiquity*, Vol. 18, No. 1 (July, 1952), pp. 95–96.

Shreveport in August, 1950. This conference concentrated on problems of pottery typology.

The Third Caddoan Conference was a "Caddoan Area Workshop Session" held at the University of Oklahoma in April, 1952. It was devoted to reports on current work in the area and to discussion of pottery types.

The Fourth Conference on Caddoan Archaeology, held in Shreveport in 1957, is the one reported on the following pages. Intensive field work in the Caddoan area, in connection with the building of federal dams and reservoirs which necessitated archaeological salvage work, brought about the need for an assessment of the current status of the archaeology of the area. Edward B. Jelks, seeing this need in the course of analysis of his materials from excavations at the McGee Bend Reservoir, initiated the conference and suggested that it be made a regular affair. Accordingly, at the Fourth Conference a Secretary was elected who had the responsibility for initiating the next meeting. It is anticipated that Caddoan Conferences will be held with some regularity in the future, in order to keep abreast of the research that is continuing in the area.

Accomplishments of the Fourth Conference

The Fourth Caddoan Conference was in many respects a sounding-out opportunity, a chance to find out what was going on in the minds of others in the field. There was a gap of six years between the Third and Fourth Conferences, so that in a sense the Fourth Conference was preliminary—a fact signalized by the lack of significant disagreement in the course of the meeting, an extraordinary circumstance in a scholarly discussion. It is anticipated that future Caddoan Conferences, although as congenial as this one, will not be as peaceful. Certainly one of the accomplishments of this Conference was that most of the participants left with the intention of coming to the next meeting armed with organized material to present towards the working out of special problems which had come to the fore during this meeting.

More specifically, there were matters which can be spoken of as concrete contributions of this Conference. One of these was the emergence of a consensus that the taxonomic units now utilized in Caddoan archaeology are far from being neat classificatory compartments. Many of the foci grade into one another, and even the two Caddoan aspects, the Gibson Aspect and the Fulton Aspect, are not as clearly demarked from each other as might appear from a brief perusal of the literature. However, there was no suggestion at the Conference that the existing taxonomic framework be discarded or even appreciably modified at this stage of studies. Whatever alterations will eventually be made in this framework must await more data than are now at hand.

The second concrete accomplishment is implicit in the agenda: there was a detailed review of the significance of pottery attributes in problems of classification and chronology in the Caddoan area. It is striking (to the editor at least) that in the course of this review the question, "What do we mean by 'type'?" never became important even though it was in the background of much of the discussion. It is a tribute to the skill of Dr. Webb as Moderator that matters were kept on factual grounds and were not allowed to bog down, at this relatively preliminary stage of current Caddoan discussions, in theoretical arguments concerning basic classificatory concepts—arguments impossible to bolster with data, since the data were not brought for the occasion.

For some of the participants—those relatively new to Caddoan work—the Conference provided an introduction to the complexes included under the rubric "Caddoan." The people from Louisiana State University, for instance, had an opportunity to see the differences and similarities between their Mississippi Valley material and that in the Caddoan area, and to get an impression of the relationships and resemblances within the latter area which give it some distinctiveness.

In general, this conference provided an opportunity to bring data together, look them over, and find where the main problems lie. Subsequent conferences will in all likelihood be devoted to more specific problems.

Nature of these Proceedings

The proceedings as recorded here are based on notes taken during the sessions. The record is incomplete, as the Secretary does not take shorthand and was himself occasionally embroiled in the discussion. To insure clarity, the original notes had to be entirely rewritten—in effect, translated into readable English—and a few changes had to be made in the order of certain remarks. As a result, the statements attributed to specific persons are not to be taken as quotations, but as paraphrases.

The second step in the preparation of the proceedings was to send the record to all participants, who revised and amended the record of their remarks according to their own notes and memories. A few of the more formal statements in the proceedings, for example those by

Gregory and by Webb on the Sanson Site, have been completely rewritten—or, in some cases, added—to insure the completeness and usefulness of the record. In such cases an asterisk has been placed after the participant's name at the beginning of the revised statement.

The third step, following this working-over by participants, was to send the record thus revised to a number of archaeologists concerned with the Caddoan area who were not present at the conference, so that they might add comments. Their remarks are included in smaller type.

It has not been possible to undertake a logical fourth step, that of a final rewriting of the whole proceedings to achieve smoothness and consistency of style. The text, as it stands, is stylistically rough and erratic, and apologies are made for this state of affairs. The editor has had to limit his efforts to the achievement of clarity.

The editor is grateful to the participants and the later contributors for their co-operation, and trusts that they will find their helpfulness rewarded by the usefulness of these proceedings.

Participants

Those participating in the Conference were:

- Michael Beckman, Shreveport, Louisiana
- Robert E. Bell, University of Oklahoma
- E. Mott Davis, University of Texas
- W. A. Davis, Jasper, Texas
- Robert L. Fulton, Shreveport, Louisiana
- Pete Gregory, Louisiana State University
- William G. Haag, Louisiana State University
- Edward B. Jelks, National Park Service
- LeRoy Johnson, Jr., National Park Service
- Robert S. Neitzel, Marksville State Park, Louisiana
- James B. Shaeffer, University of Oklahoma
- C. H. Webb, Shreveport, Louisiana
- Fred Hadleigh West, Louisiana State University

Those contributing later comments to these proceedings:

- David A. Baerreis, University of Wisconsin
- W. W. Crook, Jr., Dallas, Texas
- R. King Harris, Dallas, Texas
- Alex D. Krieger, Riverside Municipal Museum, Riverside, California
- Philip Phillips, Harvard University
- Robert L. Stephenson, Smithsonian Institution

Note on Symbols and Abbreviations

The heading "*Dis:*" signifies discussion and general comment not attributable to any one participant.

An asterisk after the name of a participant signifies that the passage which follows has been added or significantly revised, by the participant, since the conference took place.

A paragraph without a heading is referable to the heading of the preceding paragraph.

Statements in smaller type are later comments made by persons not present at the conference.

Included are maps of the Caddoan area showing foci of the Gibson Aspect and other early foci (Fig. 1), foci of the Fulton Aspect and other late foci (Fig. 2), and location of sites mentioned in these Proceedings (Fig. 3).

Introductory Discussion: Taxonomic Framework

Webb: How adequate is our general Caddoan area taxonomic framework, the foundations of which were laid down by Krieger?

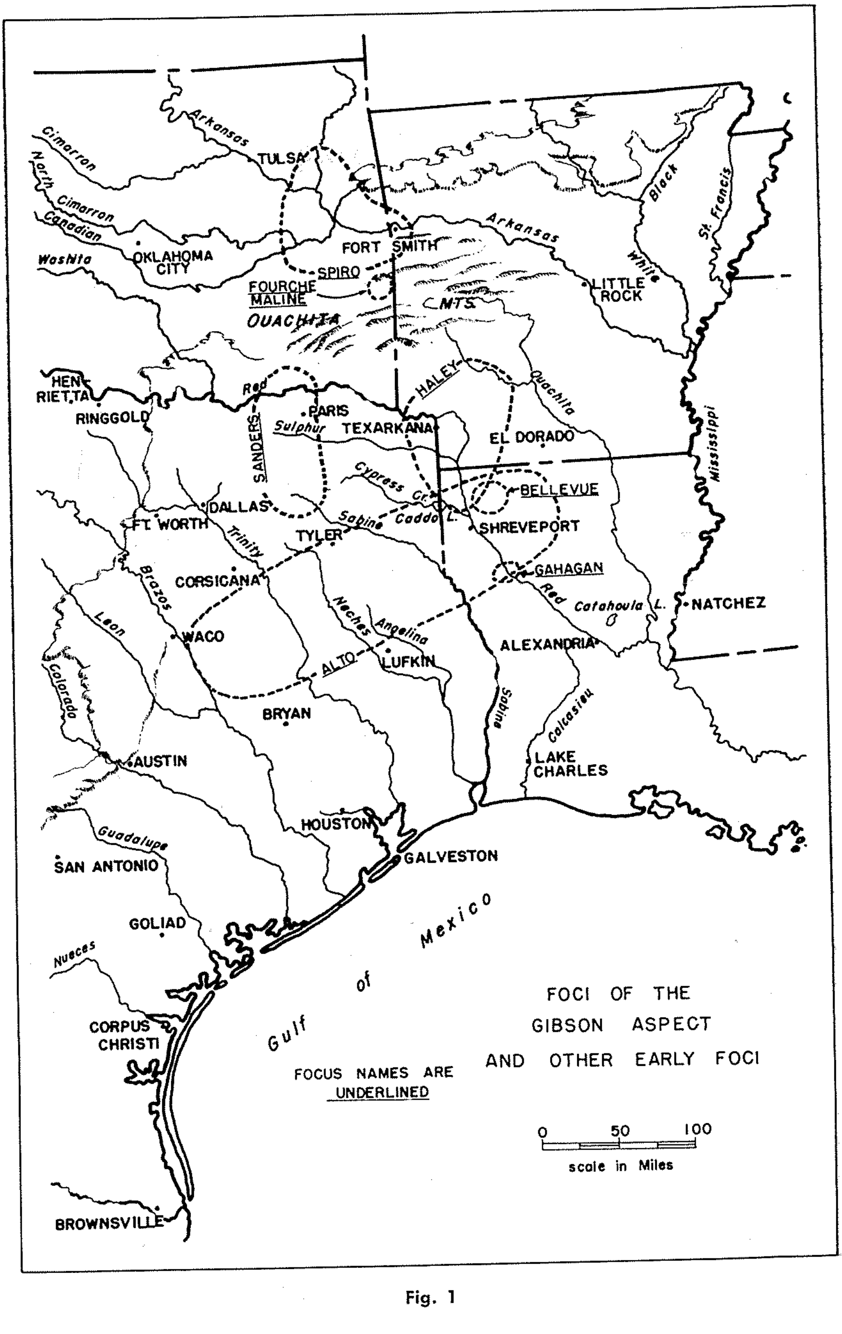
Dis: This is firmly enough imbedded so that we need to use it and to work within its framework.

"Aspect" as used in the Caddoan area is a formal, strictly McKern concept.

Baerreis: I have personally tended to use Krieger's approach to the concept of Aspects as an illustration of the manner in which the McKern or Midwestern Taxonomic classification is modified in use, rather than as a strict use of the method. The aspects would appear to be in essence a regional period classification. Krieger himself uses the term "horizon" alternatively with "aspect" (Krieger, 1946: 267).

Stephenson: I think the Caddoan taxonomic framework is one of the soundest we have for any area in the country. Krieger did an excellent job in devising this basic framework. "Aspect," as used in the Caddoan area, is *not* a strictly McKern concept. It goes beyond the McKern concept by adding a time dimension. Of course, this is what McKern envisioned when he devised his taxonomic system. That is, he presumed that people would take the taxonomic units as they would develop in the McKern system and then put a time perspective on them. This is what Krieger did in the Caddoan framework.

[Webb, at the blackboard, listed foci. He tried to list them chronologically, but this brought up problems which led to much of the following discussion. First the Gibson Aspect foci were listed and dis-



TULSA
FORT SMITH
SPIRO
FOURCHE MALINE
OUACHITA MTS.
OKLAHOMA CITY
Cimarron
North Cimarron
Canadian
Washita
Arkansas
LITTLE ROCK
Black
White
St. Francis
Mississippi
HALEY
Quachita
HEN- RIET.TA
RINGGOLD
Red
PARIS
Sulphur
TEXARKANA
SANDERS
EL DORADO
Cypress Cr.
BELLEVUE
DALLAS
FT. WORTH
Sabine
Caddo L.
SHREVEPORT
TYLER
Trinity
GAHAGAN
CORSICANA
Brazos
Catahoula L.
NATCHEZ
Leon
WACO
Neches
Angelina
ALEXANDRIA
Colorado
ALTO
LUFKIN
BRYAN
Calcasieu
AUSTIN
LAKE CHARLES
HOUSTON
GALVESTON
Guadalupe
SAN ANTONIO
GOLIAD
Nueces
Gulf of Mexico
CORPUS CHRISTI
BROWNSVILLE
FOCI OF THE GIBSON ASPECT AND OTHER EARLY FOCI
FOCUS NAMES ARE UNDERLINED
0 50 100
scale in Miles

Fig. 1

cussed: then those of the Fulton Aspect, which is later than Gibson Aspect, were taken up.]

Gibson Aspect

Gibson Aspect foci:
Alto
Spiro
Gahagan
Haley
Sanders

Dis: The Alto, Spiro, and Gahagan foci are earlier; the Haley and Sanders foci are, generally speaking, later.

Krieger: It would be better to say that the Alto, Spiro, and Gahagan foci are approximately contemporaneous and that the Haley and Sanders foci are somewhat later, but overlap the first three.

Dis: What do we mean by "Spiro"? For this discussion it means, from Krieger, Middle Spiro, i.e., the middle component of the Spiro site—the Craig Component.

*Bell:** "Spiro" materials are being found all through the Gibson Aspect, causing taxonomic difficulties because of our lack of data concerning the Spiro *Mound*, the Spiro *site*, and the Spiro *Focus*. The total number and variety of artifacts from the Spiro Mound (Craig Mound) must represent a reasonably long time period. Until we can break this down into smaller time units containing diagnostic traits, comparisons of Gibson sites with "Spiro" will remain difficult.

Krieger: If, as Bell says, Spiro materials are being found all through the Gibson Aspect, then these are aspect traits, not specifically Spiro Focus traits.

Bell: The McCurtain Focus is mainly in the Fulton Aspect, but Baerreis thinks it goes back into Gibson Aspect times. We have no final reports upon any McCurtain component at present, so I am not prepared to present the evidence. I suspect, however, that the focus is based upon such things as temple mounds, four-post rectangular houses, large burial pits, shell gorgets, ear spools, and so forth, such as are represented at the Clement site.

Harris: The McCurtain Focus or something very close to it seems to last just to the beginning of historic contact times at the Kaufman site on Red River in Red River County, Texas. I say this because of the small number of trade beads and cones made from sheet copper found around the house sites at Kaufman. Also Burial 9 at this site contained vessels which can be traced to McCurtain and proto-historic times intead of historic times. White contact is much heavier at the Womack or Garretts Bluff site in Lamar County, Texas. However, the Womack site has some sherds from McCurtain Focus. I will say that if the McCurtain Focus started in Gibson Aspect times and lasted to historic times, it had a fairly long time span.

Krieger: Why might not the McCurtain Focus represent a survival, rather than going back into the Gibson Aspect?

Dis: The Haley Focus shows a definite transition from Gibson Aspect to Fulton Aspect. The Sanders Focus is latest.

*Jelks:** There is some information suggesting that the Sanders Focus might be the earliest Gibson Aspect focus rather than the latest. The evidence is as follows. There are several ceramic traits whose earliest appearance in the Southeast seems to have been in the Gibson Aspect of the Caddoan area. These include carinated bowl forms, bottles, and engraving. These traits all occur at the large ceremonial centers such as the Davis, Sanders, Spiro, and Gahagan sites, but at all those sites they are only part of very well developed, elaborate ceramic arts. Over a sizeable area of northeast Texas are a number of smaller sites (such as the Yarbrough site), generally identified with Sanders Focus, where engraving, carinated bowls, and bottles occur, but without the elaborations found in the large ceremonial centers. Pottery is simple—and is often quite scarce—at these sites, and some of them seem to be essentially Archaic components, with the addition of small quantities of a pottery which might be thought of as representing a basic Caddoan ceramic tradition. One reasonable hypothesis that can be advanced in interpreting this set of circumstances is that a relatively early—and simple—ceramic tradition (exemplified by the Yarbrough site and others) existed in northeast Texas, out of which the elaborate developments found at the large ceremonial sites evolved. If so, the sites where the hypothetical early Caddoan ceramics occur, and which are now classified as Sanders Focus sites, could well represent a developmental phase of Gibson Aspect and may be earlier than the Alto, Spiro, and Gahagan foci—and also probably earlier than the Sanders site itself.

Krieger: This is a good idea; and I would add that there is an amazing resemblance between Canton Incised of Sanders Focus and the incised-punctated utility pottery of Fourche Maline, which Jelks' ideas would fit (as an hypothesis). It should be added that the Southern Cult at the Sanders site would then be a simple, *developmental* expression rather than a decadence of the Spiro expression of the Southern Cult. The Evans Component at Spiro (after Orr) should have been discussed here in relation to "Early Spiro" and Sanders.

Crook and Harris: We think Ed Jelks has a point. From the study of materials from several sites in Kaufman, Henderson, Wood, and other counties in northeast Texas in the last few years, we have sites which seem to be built largely on an Archaic base. These sites have very little decorated pottery; a large number of sherds from each site are plain—about 90% plain and about 10% decorated. In decoration and color this pottery falls into the Gibson Aspect. The arrowpoints are few compared with dart points—about 18% arrowpoints and 82% dart points. Alba and Bonham-Perdiz points predominate among the arrowpoints, and Gary points make up about 99% of the dart points. Copena points or knives are present in very small numbers in some sites (e.g., Trinidad). We think the utility pottery of Sanders Focus should have more study. If this is done, our knowledge of the Gibson Aspect would probably increase.

Jelks: The Alto, Spiro, and Gahagan foci form a group with many similarities. Sanders Focus stands somewhat apart. We need to give attention to these greater or lesser similarities between foci.

Bell: Aren't these greater or lesser similarities merely a matter of time span within the Gibson Aspect? *Jelks:* Yes, but also a matter of geography. What do you do with the sites that don't really fit any one focus? For instance, house floors at the Battle Mound had good associations of both Texarkana and Belcher Focus types, which demonstrates the existence of a complex that is neither Texarkana nor Belcher but which shares traits of both foci in roughly equal proportions. *Webb:* We have pottery types, such as Hodges Engraved, Sinner Linear Punctated, and Pease Brushed-Incised, which we previously thought to be pure Fulton Aspect types, but which we now know to go back into the Gibson Aspect in the Haley Focus. *Jelks:* The main point is that the foci are not distinct entities exhibiting similar types and traits from site to site. There is actually considerable variation from one site to another, and therefore a focus must not be defined as a tight cluster of traits, but rather should be allowed a great deal of flexibility.

Stephenson: I most certainly agree with this in all respects. We must sooner or later admit that no culture unit, however small, is either static in time or identical with any other culture unit. On the component level every single culture is unique; no other is exactly like it. We must devise our clusters of traits in each component, focus, and aspect in such a way as to reflect the internal temporal change that must necessarily have gone on in that unit, and at the same time reflect the external

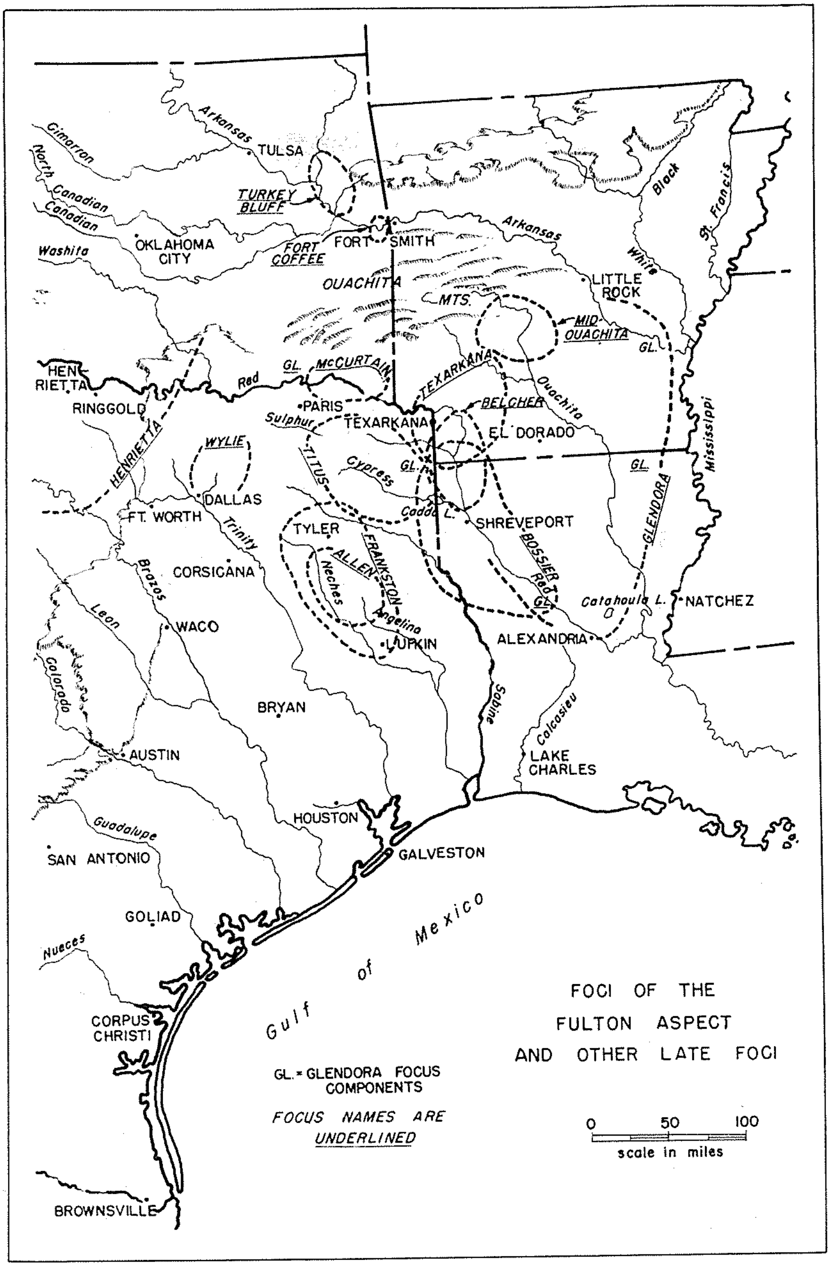

FOCI OF THE
FULTON ASPECT
AND OTHER LATE FOCI
GL. = GLENDORA FOCUS COMPONENTS
FOCUS NAMES ARE UNDERLINED
0 50 100
scale in miles
TULSA
TURKEY BLUFF
FORT COFFEE
FORT SMITH
OKLAHOMA CITY
OUACHITA MTS.
LITTLE ROCK
MID OUACHITA
GL.
McCURTAIN
TEXARKANA
BELCHER
HENRIETTA
RINGGOLD
PARIS
TEXARKANA
EL DORADO
WYLIE
TITUS
DALLAS
FT. WORTH
TYLER
ALLEN
FRANKSTON
SHREVEPORT
BOSSIER
GLENDORA
CORSICANA
WACO
LUFKIN
ALEXANDRIA
NATCHEZ
Catahoula L.
Caddo L.
BRYAN
AUSTIN
LAKE CHARLES
HOUSTON
GALVESTON
SAN ANTONIO
GOLIAD
CORPUS CHRISTI
BROWNSVILLE
Gulf of Mexico
Cimarron
North Canadian
Canadian
Washita
Arkansas
Red
Sulphur
Cypress
Trinity
Brazos
Leon
Colorado
Neches
Angelina
Sabine
Calcasieu
Ouachita
Black
White
St. Francis
Mississippi
Guadalupe
Nueces

Fig. 2

impact of acculturation upon it. The "tight cluster of little traits" concept of focus is false and misleading.

Webb: There are more common traits running through Gibson Aspect than there are running through Fulton Aspect. For instance, tapering spouts on bottles, long-stemmed pipes, Hickory and Crockett pottery types, Alba projectile points, copper plating, pulley-shaped stone ear spools, knives with recurved edges (Copena?), Catahoula Sandstone hones, large mound sites, multiple pit burials, profuse burial offerings, effigy pipes.

Dis: Earliest Caddoan (i.e., early Gibson Aspect) traits all over the Caddoan area are: Crockett, Pennington, Hickory, and Holly pottery types; tapering spouts on bottles; Alba points; delicate long-stemmed pipes; no brushed pottery; no carved shell. *Bell:* The Harlan site in Oklahoma has many of these traits, but with some differences. The Gibson Aspect is the only aspect in Oklahoma where there is ceremonial destruction of vessels.

Fulton Aspect

Fulton Aspect foci:

- Prehistoric foci:
  - Titus (Texas)
  - Frankston (Texas)
  - Texarkana (Texas, Arkansas)
  - McCurtain (Oklahoma, Texas)
  - Fort Coffee (Oklahoma)
  - Turkey Bluff (Oklahoma)
  - Mid-Ouachita (Arkansas)
  - Bossier (Louisiana, Arkansas)
  - Belcher (Louisiana, Arkansas)
  - Wylie (Texas)—possibly not Fulton Aspect
- Historic foci:
  - Allen (Texas)
  - Glendora (Texas, Louisiana, Arkansas)

Dis: The Glendora Focus seems a bit broad. About the only trait common to all Glendora sites is contact material; otherwise there is a great deal of variation.

Krieger: Yes, the Glendora Focus seems a bit broad, but contact material is not found in all of the sites, however close to the historic horizon they may be; and shell-tempered Natchitoches Engraved is a better diagnostic trait. I agree that this "focus" needs better definition and that there may be more than one focus involved.

West: Where do you find Catlinite artifacts in the Caddoan area? *Dis:* There are no definite cases in the Caddoan area, though there are some specimens of fine-grained red sandstone.

Dis: Are there any bison bones in the Caddoan area? They are absent in all Gibson Aspect foci except Sanders Focus, and are found in Wylie, Turkey Bluff, and Fort Coffee foci. *Haag:* There were bison all over the East in historic times, but no bison bones have been found in a prehistoric archaeological site.

Pre-Gibson

Bell: "Archaic" is not all Archaic. There is a "pre-Gibson," for instance the upper Fourche Maline. We are eventually going to need a separate term.

Jelks: The Snipe site (41-20D4-3) in the Texarkana Reservoir, is another possible example of "pre-Gibson." And still another example of material not covered by present classification, and seemingly pre-Gibson, is material from McGee Bend in East Texas [discussed below, p. 23]. It is neither Fulton nor Gibson, but has traits suggestive of Adena-Hopewell, including a copper reel-shaped ornament and several copper bracelets.

*Webb and Fulton:** Bellevue, in northern Louisiana, is also an example of "pre-Gibson." Bellevue mounds are situated on hilltops, representing a Pleistocene terrace, overlooking small valleys with streams. Burials are unusual, three types having been found so far: (1) primary, semi-flexed; (2) secondary, the bones having been scraped or else gnawed by animals, and later re-articulated for secondary burial; (3) cremations. Pottery is 99% plain, poor in quality, usually tempered with crushed sherds. There is some bone tempering. One burnished Marksville rim sherd and one Churupa Punctated sherd have been found. Points are all dart points averaging about 4 cm. long, chiefly Gary and Ellis types, with two San Patrice specimens. In one cremation that is probably (but not yet certainly) of this same complex, numerous stone beads and 3 copper beads were found, 40 to 50 beads in all.

Stephenson: Why not formulate a new aspect for this post-Archaic, pre-Gibson material?

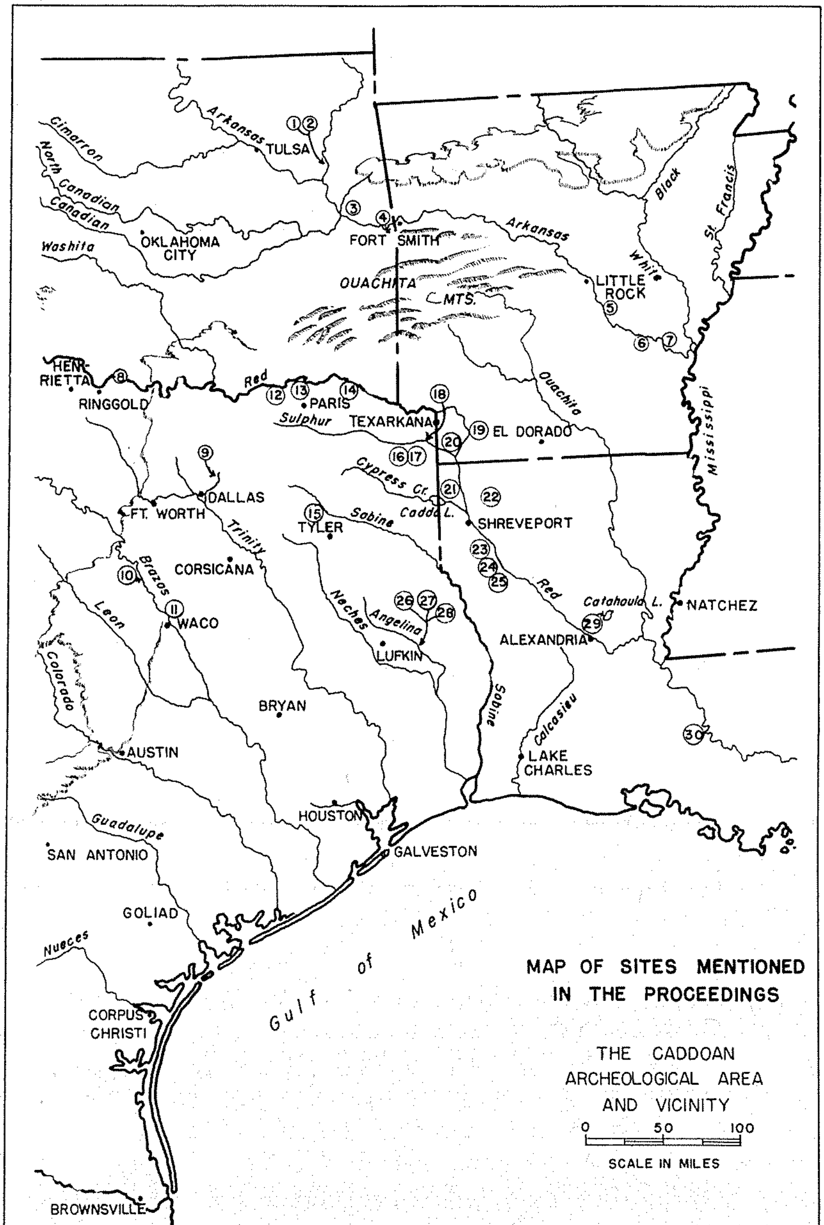

MAP OF SITES MENTIONED IN THE PROCEEDINGS
THE CADDOAN ARCHEOLOGICAL AREA AND VICINITY
0 50 100
SCALE IN MILES
TULSA
FORT SMITH
OKLAHOMA CITY
OUACHITA MTS.
LITTLE ROCK
HENRIETTA
RINGGOLD
PARIS
TEXARKANA
EL DORADO
DALLAS
FT. WORTH
TYLER
SHREVEPORT
CORSICANA
WACO
NATCHEZ
ALEXANDRIA
LUFKIN
BRYAN
AUSTIN
LAKE CHARLES
HOUSTON
GALVESTON
SAN ANTONIO
GOLIAD
CORPUS CHRISTI
BROWNSVILLE
Gulf of Mexico
Arkansas
Cimarron
North Canadian
Canadian
Washita
Red
Sulphur
Cypress Cr.
Caddo L.
Sabine
Trinity
Brazos
Leon
Colorado
Neches
Angelina
Ouachita
Black
White
St. Francis
Mississippi
Catahoula L.
Calcasieu
Guadalupe
Nueces

Fig. 3

Ceramic Typology

TEMPER AS A TYPOLOGICAL DETERMINANT

Webb: How much emphasis are we to give to certain attributes? Shell temper, for instance. In northeast Texas it is historic and protohistoric (Allen Focus). It is late in Louisiana, earlier in Oklahoma and North Texas (Nocona-Woodward).

Krieger: One should also add McCurtain Focus, in mentioning shell temper. McCurtain components occur in the adjoining corners of Oklahoma, Texas, and Arkansas; and shell temper is common in all or most of these components.

Bell: Shell is not useful as a determinant in Oklahoma. *Webb:* This is true also in Louisiana; you can't use it for Krieger's distinction between Hodges Engraved and Natchitoches Engraved. *Jelks:* In the Fulton Aspect, it would be unusual to find a type which occurs with one tempering agent exclusively, even in one site.

Krieger: It may be true that shell temper is not a useful determinant in Oklahoma, as Bell says, but I don't agree with Webb that you can't use it to distinguish between Hodges and Natchitoches Engraved. Jelks' statement is true enough as far as it goes for general purposes; but in the case of Hodges *versus* Natchitoches Engraved, the Handbook [Suhm et al., 1954] had to settle on some specific difference; and in this case we had to decide on a trait that would distinguish the two types. I still say that, no matter how much alike the vessels and decorations may be, Hodges Engraved (almost wholly in Arkansas) has no shell temper, whereas Natchitoches Engraved (in Texas and Louisiana) does have this temper. In other words, while agreeing that shell temper is not suitable for distinguishing types in most cases, in this case shell temper was seen to be significant for distinguishing two types that are otherwise very similar.

Dis: But in any case shell is relatively late in the Caddoan area. In Central Louisiana, shell doesn't appear until nearly historic times. It is a little earlier, but still rare, in the Belcher Focus (at the Belcher site, shell tempering is absent in pre-mound Haley pottery, present in 2% to 3% amounts in subsequent Bossier and Belcher), and at the Sanson site; Woodward Plain in Oklahoma (same as Nocona Plain in North Texas) is earlier; and at the Norman site in Oklahoma, shell tempering is found in a Gibson Aspect, Spiro-like component.

Krieger: Woodward Plain is *similar to* Nocona Plain, rather than being the "same as Nocona Plain" as stated parenthetically above.

KEY TO FIG. 3

Numerical	*Alphabetical*
1—Norman	Battle—19
2—Harlan	Bayou Goula—30
3—Horton	Belcher—21
4—Spiro	Bellevue—22
5—Greer	Chupek—11
6—Douglas	Clement—17
7—Old River Landing	Douglas—6
8—Spanish Fort	Gahagan—24
9—Hogge Bridge	Greer—5
10—Stansbury	Haley—20
11—Chupek	Harlan—2
12—Sanders	Hogge Bridge—9
13—Womack (Garretts Bluff)	Horton—3
14—Kaufman	Hunt—16
15—Yarbrough	Jonas Short—26
16—Hunt	Kaufman—14
17—Clement	Los Adais—25
18—Snipe	Norman—1
19—Battle	Old River Landing—7
20—Haley	Print Bell—28
21—Belcher	Sanders—12
22—Bellevue	Sanson—29
23—Smithport Landing	Smithport Landing—23
24—Gahagan	Snipe—18
25—Los Adais	Spanish Fort—8
26—Jonas Short	Spiro—4
27—Walter Bell	Stansbury—10
28—Print Bell	Walter Bell—27
29—Sanson	Womack—13
30—Bayou Goula	Yarbrough—15

The question of shell temper in a component of the Spiro Focus (or any focus of the Gibson Aspect) needs to be thoroughly investigated from the point of view of intrusion. At the Spiro site, for example, considering the nature of the field notes, it is an open question whether vessels in a grave in the Spiro Mound really belonged to the Spiro Focus or were intruded in the mound by a later people. As to the Norman site I cannot say, but *if* shell-tempered pottery were actually a part of any focus of the Gibson Aspect, I would like to see some exact field notes to prove it.

Dis: It looks as if shell tempering moved into the Caddoan area from the north. There is no shell temper in Coles Creek, but it is present in Plaquemine. In Bossier Focus, which covers a long time, shell temper seems late, and is absent from most sites.

Baerreis: Small quantities of shell temper are present in sherds of Middle

Woodland type in Delaware County, northeastern Oklahoma. This could well be a local innovation and one possible source for its early appearance in the Caddoan area.

Dis: Bone temper seems to occur mainly in Texas and Oklahoma. It is very common in East Texas, in both the Gibson and Fulton aspects. *Webb:* Bone temper is early in northwest Louisiana, in the pre-Gibson Bellevue Focus; it continues in Bossier and Belcher potteries. *Haag:* There is no bone temper east of the Mississippi. *Dis:* Bone temper is found westward into the Central Texas Aspect in Leon Plain pottery. (No one here can recall it for the Lower Mississippi, or in the Southwest.) Except for Leon Plain, bone tempering seems strictly Caddoan.

Krieger: Bone temper is not exclusively Caddoan. It occurs in several types of pottery in the southern Plains, as, for example, those described by Schmitt and others in Central Oklahoma, and the type Borger Cordmarked in the Texas and Oklahoma Panhandles.

Jelks: Sand is sometimes added, in small amounts, especially in harder pots. It is used either in addition to clay temper or without evident temper. Is it intentional? *Dis:* There are excellent kaolin deposits in the Caddoan area, where the finest wares occur. Inferior clays may have considerable sand, but in other instances sand seemed to be added intentionally.

Dis: In the Caddoan area, there is little, if any, crushed stone temper. Temper is dominantly clay. And temper is not a determinant of type.

Vessel Shape

Webb: Do we have consistencies in vessel shapes by type, or are there all sorts of shapes in each type, if you type by decoration? *Jelks:* Yes, there are consistencies within limits. For instance, there are no square bottoms in Belcher Engraved; square bottoms are a Gibson Aspect, not a Fulton Aspect, trait (except at Sanson, which is a marginal site). *Webb:* The later you get, the more variation in shape there is in terms of decoration type. Shape is not a determinant, but it is better than temper. You don't throw a vessel out of a type because it is the "wrong shape"; many of them are. The primary typological determinant, then, is decoration and surface treatment.

West: Are there any stirrup-spouts in the Caddoan area? *Dis:* Yes, some in Mid-Ouachita Focus, but these specimens, or the stirrup-spout trait, appear to be due to trade. This is a Middle Mississippi trait.

Decoration and Surface Treatment

General Discussion.

Dis: What about paste color as a trait in differentiating types? Titus Focus pottery tends to be lighter and more reddish than the dark-chocolate, black or brown on Red River and the Ouachita. Some of the Titus Focus types of Krieger are almost the same as some of the Texarkana and Belcher types, but the lines are heavier and the color is different. Burnished black pots evidently were carefully made and the firing was controlled. In this case, color is important because of the firing technique.

Applied color and slips are not consistent within any one type. Rubbed-in color occurs only in engraving (with the rare exception of a few vessels of East Incised), and hence is more limited. Red film in the Gibson Aspect is limited to Sanders and Haley foci.

Is the distinction between "incised" and "trailed" clear? Consensus: yes, it seems to be.

There is no cord-marking in the Gibson or Fulton Aspects, except at the Sanson site, which is peripheral and would fit with Troyville and Coles Creek. Absence of cord-marking is a negative Caddoan trait. (The decorative technique on Sinner Linear Punctated pottery looks like an imitation of cord-marking.)

Is it all right to use hyphenated names for types? For instance, Pennington Punctated-Incised, Pease Brushed-Incised. What should the policy be? (No decision.)

Stephenson: I for one do not like the long hyphenated names. They serve very little useful purpose and hinder concise writing. Type names should be as brief as possible in order to be most usable.

Krieger: Hyphenated type-names seem justified in some cases, as when a Pennington design is done entirely in incised lines, seemingly as a simple substitute for combinations of lines and punctates; or when Pease vessels have either incised or brushed lines, or lines which cannot easily be determined as incised (cut with a single sharp implement) or brushed (cut with a few stiff grasses or the frayed end of a stick, etc.). The alternative would be to set up separate "types" which probably had no meaning to the people who made the pots.

Webb: Curvilinear incising and trailing (parallel line, scrolls, spirals, volutes) seems most common along the Ouachita and west as far as the Red. Is it found farther west? *Dis:* It is found sometimes in Titus Focus, and sometimes in Oklahoma, mostly in the Fulton Aspect. This trait seems to center on the Ouachita, but is also found around Natchez, and extending into the Mississippi Valley (Leland Incised).

Phillips: But don't forget that it goes back at least to Yokena, which has some very fine meander patterns (but not spirals as far as I know), and this continues on into French Fork Incised. Leland, Fatherland, and Natchez appear to be the end products.

Bell: Williams Plain sometimes has incisions on the rim. Should you have two type names, Plain and Incised? *Dis:* The occurrence of a few incised lines on otherwise plain vessels would not necessitate two separate types. (Not 100% agreement on this. Discussion of this and related problems. The implications of same and different names, e.g. Dunkin, Manchac). Should there be type names and variant names? Jelks is in favor of lumping. Webb points out inclusiveness of Pease Brushed-Incised.

Phillips: I think there should be type names and variant names. Wheat, Gifford, and Wasley are shortly coming out with a proposal for the classification of Southwestern ceramics that may be the answer to our problem. [see Wheat *et al.*, 1958; Phillips, 1958].

Stephenson: Names for variants serve no purpose until they have broad cultural significance, and as soon as they have broad significance they become type names. I think we should lump all of these things as much as we can. There is certainly nothing wrong with minor amounts of decoration in a plain pottery type if this fact is clearly stated in the definition of the type.

Webb: You often get one decoration around the rim and a distinct one on the body; for instance, in the Titus and Mid-Ouachita foci there are bowls with engraved rim and a different decoration (one of several techniques) on the body. (*Dis:* This is found in the Glendora and Texarkana foci too.) Which is to be considered most important, the rim decoration or the body decoration? In the past we [Webb and colleagues] have generally assumed rim decoration as the determinant. Earlier, for instance in the Haley Focus, there is none of the body decoration on these bowls.

Krieger: Alto Focus should also be mentioned, since there you often find rim and body with decoration done in different techniques. Rim decoration has usually been chosen as "more important" in Caddoan ceramics because rim sherds tell more about vessel shape and size, and rim decorations are more variable than body decorations.

Bell: How much of this pottery is made purely as burial ware, and how much is utility ware? And why do you have concentrations of points in only one area of a site? *Webb:* Do you find arrow points in burials, or both arrow and dart points? *Dis:* Webb finds only small points with burials. Bell likewise, in Oklahoma. But dart points are found in these sites. *Shaeffer:** Both dart and arrow points are found with burials in the Horton site, near Vian, eastern Oklahoma. The dart points are late, or a small variety of Gary point. *Dis:* Red River sites, on the floodplain, have only small points. Upland and terrace sites have large points in addition. It looks as if typology of small points may eventually turn out to be more helpful than has been thought in the past. There certainly is an element of selection in burial materials. But even then, you find *some* of the fancy material in the middens. There does not seem to be any special burial ware, with the possible exceptions of Cowhide Stamped, and head effigies (in Arkansas only). It is rather a matter of selectivity; you get the good material in the burials, along with some everyday specimens. *Shaeffer:** In Oklahoma, decorated pottery is confined pretty much to burials, and plain ware to house areas. Perhaps this is an area differentiation, in Oklahoma within the Caddoan area.

Haag: How about having the next conference work out geographic distributions of certain pottery types? For instance, pottery motifs—the scroll, ticking, hatching, and the like. We could use dittoed maps of the area in plotting distributions. This might focus the matters we have been discussing.

Gregory: What significance is there to the distribution of *large* notched points? You find a few in the valleys, more on the hills.

Webb: How do you distinguish between dart points of Archaic and post-Archaic sites? *Dis:* In the Lower Mississippi area, the same types of dart points occur in both Archaic and later complexes, and this is also largely true in the Caddoan area. And certainly you can't distinguish between Archaic and post-Archaic sites on the basis of presence or absence of dart points. *W. A. Davis:* The problem of distinguishing Archaic from non-Archaic sites is worth taking up as a special subject at a later Conference.

Dis: Gary points are of all sorts, and will probably be subdivided chronologically. *Bell:* Gary points seem to get smaller, lighter, and with bigger shoulders, as time goes on; this is a hunch. *Dis:* This hunch seems to be borne out in the Poverty Point report (Ford and Webb, 1956, p. 54, Fig. 18). Some Gary points are quite small.

Stephenson: This hunch is absolutely true from Texas to the Atlantic. It's no hunch at all. It's a fact.

Dis: Discussion of the atlatl *versus* the bow, and of "atlatl weights." Perhaps the atlatl survived in the Fulton Aspect as a specialized implement, for example, for use in fishing.

Categories of Surface Treatment

Plain
Incised
Brushed
Punch-&-Drag
Trailed
Appliqué
Punctated
Engraved
Ridged
Pinched (separate technique? Probably should be so considered)
Stamped
Combed

Krieger: Under "Punctated" you need two treatments: stick punctates and fingernail punctates. These are clearly used in different ways and are different on certain types of pottery. In the Lower Mississippi Valley you also have linear punctates made with serrated shells or something similar (this is also found in the Midwest), but this probably doesn't concern Caddoan ceramics. As to whether "pinched" is a separate technique, I should say yes.

PLAIN (As a vessel, not just a sherd, character). *Dis:* Is there more plain ware in the Gibson Aspect than in the Fulton Aspect? Fulton vessels are likely to have more of the surface decorated. There are plain vessels in all shapes and in all periods.

INCISED. This technique is found throughout the Caddoan sequence.

BRUSHED. *Dis:* Is there any brushed pottery in the Gibson Aspect? *Jelks:* At the Davis site, some "fine incising" might be brushing. *Webb:* Haley Complicated Incised, in Haley Focus, is often seemingly brushed. Perhaps brushing started here. *Dis:* The Bossier Focus has brushed pottery. In Central Louisiana, the earliest brushing is in Plaquemine. (Except that Tchefuncte has Chinchuba Brushed, a very localized type. This, like a lot of Tchefuncte traits, died out, leaving no evident descendants. There is similar material in early Southeastern pottery, e.g. at Stallings Island.)

Krieger: Brushing is present in Haley Focus, on the Pease Brushed-Incised and Haley Complicated Incised types at least. On Pease it may occur alone or with incising; and on Haley Complicated Incised it may occur in some of the circles and odd areas, along with incising and appliqué. Brushing, red film, appliqué, handles, lugs, and effigies all *appear* to enter the scene with Haley Focus and then become common in various Fulton Aspect foci.

Phillips: In Mississippi (Yazoo Basin) our type Salomon Brushed is at least as early as Coles Creek. It is not always distinguishable from incision, however. Caddoan brushing could have come from this.

PUNCH-&-DRAG. *Dis:* This is a special incised-and-punctate technique. You find it in Tchefuncte (Orleans Incised), but not used in the same way as on Caddoan vessels. In Caddoan pottery it is mainly used in lines dividing fields. It is a minor technique, in other words, serving the same function as appliqué or punctate lines.

A special treatment to be considered is the making of small depressed triangles (not excised) at the end of incised or engraved lines. Did this trait come into the Caddoan area with French Fork Incised? (Ford's idea.) *Haag:* It could have spread in the other direction.

TRAILED. *Dis:* This trait is late in northwest Louisiana, in the Belcher and Glendora Foci. It appears at the same time as do groups of curvilinear lines. It occurs in Military Road Incised, Cowhide Stamped, Keno Trailed. In these types it is often used to outline zones, as in Marksville; but it is not so used in Texas except in the Titus Focus and a little in the Texarkana Focus. It is found in Tchefuncte pottery.

What is the difference between Foster Trailed-Incised and Keno Trailed? On sherds you often can't tell. The shapes are different, and so is the frequency of certain design elements.

APPLIQUÉ. *Dis:* As far as the Caddoan area is concerned, this treatment appears earliest in the Haley Focus (Pease Brushed-Incised and Haley Complicated Incised) and Sanders Focus (Maxey Noded Redware). It is absent in Alto Focus. It is found throughout the Fulton Aspect. In Fort Coffee Focus it is not common, but it is common in McCurtain Focus. As for nodes, they are found at the Haley Site, in the Haley Focus component at the Belcher Site, and in the Sanders Focus (Maxey Noded). Nodes are common to the east, in St.

Francis. Appliqué seems on first glance to come from the Mississippi Valley, but the earliest appliqué there is Fortune Noded, which is fairly late. Appliqué is popular at Cahokia and northward to Wisconsin, but it seems to be late everywhere. Perhaps this trait spread *from* the Sanders and Haley Foci. But, on the other hand, the Haley Focus has Mississippian trade material in it, for instance shell tempered trade vessels, so appliqué in Haley Focus may not be earlier than in the Mississippian material. Thus we don't know where appliqué might be earliest.

PUNCTATED. *Dis:* This trait is found everywhere. But what about profuse fingernail body punctate, e.g., Wilkinson Punctated? This tends to be early, fading out at about the time brushing comes in. It is *very* frequent from Alto Focus into Bossier Focus and drops out in the Belcher and Glendora foci. The situation is the same in Oklahoma. In Central Louisiana it is late (Parkin) but this seems to be different from Wilkinson Punctated.

Phillips: But there are earlier types in the Lower Mississippi Valley showing the same technique, e.g. Evansville Punctated.

Dis: Is fingernail punctate earlier elsewhere than in the Mississippi Valley? It is found in Tchefuncte and also at Stallings Island in Georgia. This, however, is random punctate. In East Texas, fingernail punctate is usually thought of as Alto Focus.

Krieger: Fingernail punctate may usually be thought of as Alto Focus in East Texas, but it does continue into the Frankston and Titus foci in quantity, and in the Allen and Texarkana foci somewhat. When one collects a large number of sherds from a site in the central part of East Texas, it is often possible to guess the affiliations as Alto Focus if there is a lot of fingernail punctating (and pinching), but no brushing, on body sherds of utility jars; and conversely one may suspect Frankston, Allen, or Titus foci if the reverse is true: lots of brushed jar sherds but comparatively little fingernail punctating or pinching. In testing scores of sherd collections, this distinction proved to be a rather good and constant *clue* to the focus. Then, one would naturally look for the proper associated types of engraved ware, and so on.

Marginal Cultures

McGee Bend Reservoir, Lower Angelina River, East Texas

Jelks: All the sites excavated at McGee Bend last Fall [1956] have, among other things, some very sandy pottery, undecorated, with simple vessel shapes. This is supposedly close to the western edge of its distribution. Goose Creek sites have this sandy material, but it is often decorated. The Jonas Short Mound, at McGee Bend, had it. One rocker-stamped sherd, Marksville or Troyville, was associated with it at the Print Bell site at McGee Bend.

Haag: You don't get this in southwestern Louisiana, and work has been done there, by McIntyre. On the east side of the lower Sabine you get only Tchefuncte and Marksville sites. Farther east you do get sandy ware, Alexander-like, in Tchefuncte sites.

Jelks: At the Walter Bell site at McGee Bend, we have also a punctated-incised ware, similar to Pennington but rather poor. *Haag:* This is found all across southern Louisiana, and it all resembles Pennington or Rhinehardt. In the same area there is also a "cheesy French Fork Incised" and also an incised "messy Dunkin" or "messy Manchac." *Webb:* This material is probably later than both Pennington and Rhinehardt. The vessel shapes are different and the treatment of decoration idea and paste is different. *Dis:* This material should have a separate name in order to distinguish it from Pennington and Rhinehardt. *Jelks:* What about "Angelina Incised"? *Dis:* It includes both incised alone and punctated-incised. It derives from Pennington-Dunkin (in Texas) or Rhinehardt-Manchac (in Louisiana). In this case one name should be valid, even though elsewhere two names are used depending on whether or not punctates are used. *Jelks:* In addition to the differences in decoration, the Angelina vessel shapes are wrong for Pennington. At the Walter Bell site (at McGee Bend) we do have good Pennington—in addition to this poorer material—but it grades off into the poor material. We have Dunkin too; it is found east into DeSoto Parish, Louisiana, for instance at Smithport Landing. *Webb:* There should be Alba points with this. *Jelks:* There are some Alba points, but mostly the points are Perdiz. We have free punctates too. *Webb:* This is Wilkinson Punctated. *Jelks:* Also we have sloppy ridged pottery—it is really incised (*Webb:* Karnack Incised); these vessels are in burials, with Perdiz points. Possibly it means that there were two occupations at Walter Bell.

Webb: At Smithport Landing you find things like this, and they appear to be due either to two occupations or to a general development toward Bossier Focus. Stephenson's material from his 1948 reconnaissance at McGee Bend was, according to Krieger, Alto III and "Shelby Focus"—later re-named Bossier. To me this appears to be an Alto-Bossier development.

Stephenson: For most of the sites producing enough material to tell in my reconnaissance of the McGee Bend area, I believe this statement is quite true.

Jelks: In East Texas, Perdiz points are supposed to represent the Frankston Focus. At Walter Bell there are not only Perdiz, but Bassett points, which are similar to Perdiz. *Webb & Gregory:* At the Sanson site you get both Perdiz and Bassett points. The difference between Perdiz and Bassett points is in whether the stem goes below the barbs or not; if it does, you call it Perdiz.

Wylie Focus

Jelks: Along with Fort Coffee and Turkey Bluff, the Wylie Focus is a sort of buffer between the Caddo area and the Plains. It has both Caddoan pottery and Plains material. The type site is Hogge Bridge. There is some Sanders and some Frankston pottery. The points are of the types Alba, Bonham, Perdiz, Fresno, Cliffton, and Plains triangular (Harrell). Wylie Focus sites are small. Hogge Bridge seems to represent a brief occupation and the associations seem good. In the middle of each site is a saucer-shaped depression about 100 ft. in diameter. Nocona Plain, a shell-tempered pottery type, is found here and farther west. There are eight or ten Wylie Focus sites in a localized area in the Trinity drainage. Wylie Focus also has bone work: bison scapula hoes, fish hooks, bone pins. There is also charred corn.

Webb: The Bonham points in Wylie Focus are very much like Alba points; is Bonham really a separate type? *Jelks:* Some Bonham points are more like Perdiz points.

Webb: It looks as if Wylie Focus covered a long time.

Jelks: It seems closely related to the Henrietta Focus; Krieger originally included in the Henrietta Focus several Dallas County sites which later became incorporated in the Wylie Focus by Stephenson. We don't know whether the Caddoan pottery is trade ware or not. The Henrietta Focus has a stronger Plains flavor and doesn't have the basins. There are probably more Wylie Focus sites than those which have been recorded—non-pit sites, for instance. The burials usually don't have offerings, and are tightly flexed—a Plains, rather than Caddoan, trait.

Bell: Wylie Focus is very odd; it is reminiscent of Fourche Maline.

Krieger: I do not feel that the Wylie and Fourche Maline foci are much alike, either in ceramic or non-ceramic traits.

Baerreis: Jelks speaks of the Wylie Focus as "a sort of buffer between the Caddoan area and the Plains." This has an implication in terms of historic events that may not be quite adequate. For at least the northern margin of the Caddoan area the Fulton Aspect would appear to represent a shrinkage in the geographic scope of the late Caddoan cultures. The shrinkage may in part be due to a somewhat earlier departure of Caddoan-speaking peoples from the area—Wichita, Pawnee, and Arikara, for example—and with their departure and residence in the Plains the opportunity for culture contact with linguistic relatives would be enhanced. If a "buffer" implies, as my dictionary states, "anything serving to deaden a shock or bear the brunt of a collision," I would argue rather for a peaceful contact situation allowing for a free interchange of traits.

Stephenson: To me, the Wylie Focus is simply a marginal group of Fulton Aspect people who, due partly to geographic location, absorbed a number of Plains (or Henrietta Focus) traits. I fail to see the relationship between Wylie Focus and Fourche Maline, but then perhaps I am not adequately acquainted with Fourche Maline. The Wylie Focus appears to me to have had its beginning early in Fulton Aspect times, if not perhaps overlapping the last dying gasps of the Gibson Aspect, and certainly continuing on long into Fulton times. I am sure there must be more sites of the Wylie Focus than we have recorded, particularly—as Jelks points out—sites without pits.

Crook and Harris: We have thought of the Wylie Focus as follows: the first occupation was Archaic for a long period of time, then contact was made with pottery cultures of Gibson or pre-Gibson Aspect and continued through a part of the Fulton Aspect. The Henrietta Focus also exerted some influence on Wylie Focus. The Wylie Focus people may have also made a small amount of pottery.

Central Texas Caddoan Material

*Jelks** [Elaborated later on the basis of comments by Krieger]: There is a band of material between the Brazos and Trinity rivers, between the latitudes of Waco and Austin. A few sites have sherds of Alto Focus types, Alba arrowpoints, and Copena points or knives. Other sites have numerous Frankston Focus sherds and associated artifacts; and still others have sherds more closely resembling Sanders Focus types than any others. Krieger calls the Chupek site near Waco, where Frank H. Watt has made extensive collections, primarily an Alto Focus component, but there are sherds and other artifacts of the Frankston Focus there too, as well as sherds resembling Sanders Focus types. The Alto Focus pottery types at

Chupek include Weches, Dunkin, Pennington, Crockett, Holly, and Hickory. There is another component near Bryan with several of the key Alto Focus pottery types, Alba points, and Copena knives, but no admixtures of other Caddoan foci. West of the Brazos, you find fewer dart-point types of the Alto Focus (Wells, Morrill), Copena knives, and Alto Focus sherds, and these disappear as you go west in Central Texas. Presumably, all Alto Focus pottery found west of the Brazos (and possibly the typical dart points and Copena knives as well) was carried there by traders or visitors. On the other hand, Frankston Focus pottery is fairly common in Central Texas and extends much farther west than any Alto Focus traits.

Oklahoma Quartzite Industry

(Bell and Shaeffer showed specimens from an Oklahoma quartzite industry. This material does not seem related to Caddoan material but was introduced for general appraisal.)

*Schaeffer:** For some time quartzite chips, cores, and tools from sites principally in central Oklahoma have been brought in, mainly by Dr. Sherman Lawton. Bell has examined several of these sites and has found Plainview points. The sites are characteristically located away from present water sources or on high ground above them and, in southwest Oklahoma and the Panhandle, on the shores of now dry lakes. The collections contain many chips and large fragments but, except for knives and a few point fragments, no bifacially chipped artifacts. The remainder of the tool types are pebbles which are percussion-chipped on one face only. These consist of choppers, high-backed planes or pebble scrapers, a form which might possibly be a prototype of the Clear Fork Gouge, hammerstones, and possibly a few grinding stones. A recognizable point which was found is a typical Plainview form 2.5 cm. wide, and a small 5 cm. quartzite projectile point with a single prominent shoulder is reminiscent of the Sandia point form. The present distribution suggests a western connection but it may be that future surveys will fill the gap to the south so that it can be more directly connected with Archaic material in north central Texas.

Jelks: These specimens can be duplicated (except that the material of which they are made is different) in the Edwards Plateau Aspect of Central Texas; but the Edwards Plateau sites which contain specimens like these are quarry sites, and the specimens are thought to be rejects. *Shaeffer:* If these are rejects, where are the tools? In Central

Oklahoma, they are unique. They seem to occur mainly along the Canadian, but this distribution may simply reflect where the work has gone on. The investigation is really just beginning. *Jelks:* Perhaps this is a flint industry which has moved into a non-flint area. *Shaeffer:* Typologically and in selection of stone, these specimens hint at a developmental sequence. To me, the main resemblance is to Cochise.

Peripheral Materials in Arkansas

Dis: Were there Caddoan settlements along the lower Arkansas River? The Douglas, Greer, and Old River Landing sites between Little Rock and Arkansas Post—are these Caddoan sites with some Mississippian and Quapaw, or are they, as Griffin suggests, Quapaw with Caddo influence? They have vessels with banded punctates (formerly called Menard Punctate Banded; now called Owens Punctated). These sites have painted vessels and the teapot shape, plus Caddoan material. [Looking at C. B. Moore illustrations.] They are all quite late. This seems to be a Caddoan-Mississippian contact area. The Greer site in particular is surely mainly Caddoan. It is late, with shell temper; late Foster Trailed-Incised pots, and painted pottery, among other things.

Stephenson: Robert Greengo made a survey for the River Basin Surveys in the Spring of 1957 at the Dardanelles Reservoir area about midway between Fort Smith and Little Rock, Arkansas. Here he found a number of sites that provide sherds and projectile points of perfectly good Caddoan types running through all time periods. Particularly numerous were projectile points that seemed to relate the sites to the Archaic period in the Caddoan area. This, of course, is an extremely fringe area relative to the Caddoan area, and the materials Greengo got were only surface collections; consequently, there isn't much that can be said about them at this time. I am sure that with some testing and excavation in these sites before the dam is built, we will have something of major significance from the area.

Sanson Site

*Gregory:** The Sanson site is located on the south end of Catahoula Lake in Rapides Parish, Louisiana. The site runs along a broad sandy ridge and covers a small island. It consists of two dome-shaped mounds, one truncated pyramidal mound and vast midden accumulations. There might possibly have been a plaza associated.

One of the dome-shaped mounds was a burial mound that was excavated during the 1930's by the Sanson brothers for the collections of Mr. Edward F. Neild and Mr. and Mrs. U. B. Evans. These individuals supervised the work at the site and Mr. Emerick Sanson was put in charge of the field crew. They used a standard grid system and four lateral trenches by which the whole mound was moved.

The mound contained numerous burials, a great many of which had been reached by the plow line. Therefore a lot of the material at the site was scattered by the plow prior to the excavation. There were three cremations in the very center of the mound and these were accompanied by an offering of three groups of five pots, all of which were ceremonially "killed" either by perforation (before or after firing) or by smashing. There was also a placement of two pipes at the cremation. Scattered through the fill (there was no stratification visible) were numerous other burials accompanied by all types of offerings ranging from arrow points to vessels. A good number of the vessels were ceremonially "killed." The burial forms ranged from disarticulated to extended forms.

The pottery types included a number of "typical" Plaquemine Period types, plus a good number of Caddoan types such as Maddox Engraved and Pease Brushed-Incised. The projectile point types included a number that were definitely Caddoan in origin, such as Perdiz, Bassett, Steiner, and Hayes; plus some types that are found with material in the Lower Mississippi Region such as "Fir Tree," a form which might be compared to Scallorn in Texas. A number of large notched points including San Patrice and Ensor, have been collected from the surface of the site, and since many of these are worn and broken, they might indicate an Archaic site in the area.

*Webb:** Surface collections along the beach at Sanson indicate to me a fairly long occupation, with stone work which appears Archaic (probably late), sherds of Marksville, Coles Creek, Plaquemine, and Caddoan pottery types. None of this is surprising, since the site has a favorable location fronting on the lake, generally above high water and with good soil available. Gregory is hesitant about concluding that there was an Archaic occupation, because of some geological implications—not too certain—and the frequent occurrence elsewhere of Archaic projectile point types extending into the pottery-making horizons. Our surface collection in the summer of 1957 [after the Conference], however, included crude pointed or "pick-like" tools, one graver, and numerous large and small flake "scrapers," in addition to a variety of projectile types, all in one day's search. To me this seems to be too much for a simple "carry-over" of Archaic traits.

The major and apparently final occupation was the mound-building period, which is a mixture of Plaquemine and Caddoan traits. Gregory and Ford think it is primarily Caddoan with some Plaquemine; I think it is primarily Plaquemine with some Caddoan; the truth probably is about 50–50. Each of us inclines as he does because the total assemblage is considerably different from either Caddoan or Plaquemine, as the case may be.

In summary I would say that the Sanson site represents occupation from late Archaic through Marksville-Troyville and Coles Creek to a final, and apparently major, occupation by a mound-building people whose culture represents an admixture or amalgamation of Fulton Aspect Caddoan and Plaquemine traits. The strength of influence from either direction and the presence of pottery decoration which is similar to, but not identical with, that found in the Caddoan or Plaquemine areas makes it unlikely that trade objects could account for the situation. Moreover, the presence of some traits which are different from either Caddo or Plaquemine elsewhere will probably set Sanson apart as a distinctive culture. In relation to the Caddoan area, Sanson could be considered as a fringe culture which has Caddoan affinities.

General Discussion

Discussion of trade and its importance, particularly in relation to Poverty Point and Hopewell. Might organized traders from Mexico have come into the Southeast? This idea is being worked on by Dr. William Sanders of the University of Mississippi, in a project for Louisiana State University.

Haag-Webb controversy on where the Poverty Point people got the idea of building those earth structures. This is no matter of incidental stimulus diffusion, says Haag; this reflects closer contact. It is not the same as Mexico-Southeast relationships. And how does one explain the microflints in Poverty Point?

Discussion of burial types. [Transcription incomplete.] In Oklahoma, all types of burials run all the way through the sequence. In general, in the Caddo area, cremations are exceedingly rare, and seem to be early. Nearly all Fulton burials are simple extended primary burials. The trait of large deep pits with multiple burials and large offerings is uniquely Caddoan in the Southeast (it also occurs in Hopewell).

Historic Sites

(Topic taken up at the request of West)

West: Where are there sites with contact material? What are the late pottery types—like Fatherland Incised? *Webb:* Natchitoches Engraved and Keno Trailed, especially when they are shell tempered.

Neitzel: It is surprising how few European trade goods are to be found in localities where the French are known to have been for a number of years. As a related problem, we tried finding material in known spots on Civil War battlefields, using mine detectors, and often found very little. White-Indian trade may have emphasized perishables.

West: Is there much contact material in the mission sites around Nacogdoches? *Jelks:* None of these sites has been excavated. One finds beads on the surface. Small beads—"seed beads"—are most common. *West:* You don't find those in Louisiana. *Dis:* If you sieve the dirt, you will find them. *Webb:* Around Natchitoches, most beads are ½″ long. *Dis:* These are Venetian glass and porcelain. There are no trade sites in northwest Louisiana; only at Natchitoches. The Hunt and Clement sites in East Texas are historic, as in Womack (Garretts Bluff). *Jelks:* Spanish Fort, on both sides of the Red River in Texas and Oklahoma, is a major historic site; this is a Taovayas site (Wichita Confederacy). Another is Stansbury, on the Brazos River above Waco, probably Tawakoni (Wichita Confederacy).

Dis: Extended discussion, at prompting of West, of information on different sorts of trade goods: beads, various kinds of china and earthenware—Majolica, feather-edge, Willow ware, etc.; stone ware; glass, green glass. The best things to look for in the Caddoan area that will indicate a historic date are glass beads, metal knives, iron bracelets, and gun fragments. Very little chinaware on any site. Porcelain dolls may be expected. [Note differences with West's comments below, which were added later.—Ed.]

*West:** Following are impressions of what are presently taken to be contact sites in northwestern, central and southeastern Louisiana:

No excavation has been attempted and, indeed, in most cases indications are that the bulk of the material is on the surface and in the root zone. Thus the establishment of definite association, and hence contemporaneity, of the Indian and European materials is difficult. Seemingly the only possible approach is to determine first that one is dealing with unequivocally late Indian pottery types such as Fatherland Incised. Secondly, it must be possible to state with some certainty that the White materials are of the same general time period. The latter of these two problems is more difficult.

My observations of sites of this kind have led to the conclusion that looking for trade goods as such, and using them as the prime determinant of the contact site, can lead to serious errors. Far and away the most common item of White manufacture consists of china sherds. Probably second most common are Churchwarden pipestems. Less numerous are musket balls. Green bottle glass is fairly common. One finds, after a while, that he develops a "feel" for the European material. Some "feels" old and some not so old. I have not yet had an opportunity to check and verify this sensation, so it may develop that I "feel" upside-down: what is early may "feel" late, and vice versa. In other words, this is a raw field impression.

Having determined rough coevality in a surface sample of late Indian pottery and early White material cannot, of itself, prove the site to be an historic contact one. It does, however, render this supposition highly likely and may in many cases constitute the best hypothesis.

If the sites from which this discussion is drawn are indeed of the contact period, then there is in this area an apparent anomaly: standard trade items such as glass beads are virtually absent. Instead, European china and glass are found. This is in marked contrast to contact sites elsewhere in the country. Perhaps a partial explanation is that very little of the early exploration here was overland. Another possible pertinent factor may have been the very early and widespread missionizing among the Indians which most often entailed the actual residence in the village of a priest.

Actually, the paucity of such materials at other sites in other areas may be more apparent than real. Such things as china, being slightly suspect as being non-contemporaneous, may have been overlooked in favor of the more obvious trade goods.

I have observed one type of china, Featheredge, in contact situations in such widely separated localities as Louisiana, North Carolina, and North and South Dakota. Unfortunately, Featheredge has such a long period of apparently great popularity (ca. 1750–1850) that it is of little utility as a time-marker. In fact, there have been exceedingly few contact sites that have not yielded at least one sherd of this ware.

For the most part, identification of European ceramics must be done by an expert in such matters. There are few of these willing to undertake such a tedious task gratis, and all of them are generally swamped with requests for identification, so that the problem of identification is a difficult one.

Quimby's Bayou Goula site yielded abundant china and glass. I have done some testing at Los Adais, the site of the Spanish mission and presidio among the Adai. Expectably, china and glass are also of frequent occurrence here. A comparison of these materials from Bayou Goula and Los Adais, both of which are dated, may yield a basis for more certain identification of European wares found elsewhere in the region. In fact, it was with this plan in mind that I tested at Los Adais. None of this material has, as yet, been analyzed, so the success of this scheme is still unknown.

It is impossible to draw any firm conclusions from incomplete work. However, it does seem conceivable that a re-examination of other contact sites may be in order. Perhaps the apparent situation here in regard to surface indications may not be quite so local in character as it now appears.

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A Suggested Developmental Sequence for House Forms in the Caddoan Area

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Introduction

EUROPEAN EXPLORERS of the late seventeenth and early eighteenth centuries who visited the Caddoan area of northeastern Texas and adjacent Louisiana and Arkansas reported that the Indians whom they found there were living in large houses made of poles and grass. Joutel (1879, 1906) describes the structure and Espinosa (in Swanton, 1942) the construction of such houses.

Most reports on Caddoan archeology are justifiably vague in discussing houses beyond describing post mold patterns. The implication is that construction methods of the early historic period extend into the prehistoric period for some unspecified time. There is little speculation as to what went before. However, a close study of the available material indicates that the Caddoan house of historic time is but a late manifestation of a house type with a long and complex history and that its sources must be sought outside the Caddoan area—indeed, at great distances from that area.

Historical Evidence

The earliest historical reference we have in which houses are mentioned is Ranjel's diary of the De Soto expedition. His description of the attack on a village of the Province of Tula in southern Arkansas includes this statement: "they [the Indians] climbed on top of the houses, where they tried to defend themselves with arrows; and when driven from some would climb on top of others" (in Swanton, 1942: 29). This was in 1541. In 1687 Douay (Shea, 1852: 204) and Joutel (1879: 345), both of whom entered the Caddoan area with La Salle, describe the houses they saw there as fine, large, round cabins in the shape of beehives or haystacks, some of which reached sixty feet in diameter and fifty feet in height. These houses were built of poles set into the ground around the circumference of the house, bent and joined together at the top, and covered with a thatch of long coarse grass. Subsequent writers describe similar houses: Theran (Bolton, 1915), Espinosa (Hatcher, 1927a) and Mézières (Bolton, 1914).

A comparison of Ranjel's statement with the descriptions of those who followed him seems to suggest some interesting developments in the houses of the area during the one hundred and fifty intervening years. If De Soto's victims defended themselves from their housetops, it seems highly unlikely that these houses were of the high conical type reported by Joutel and others. Such houses could not permit rapid ascent and at best would leave but one arm free for the manipulation of bow-and-arrow, a feat (if performable) requiring wondrous dexterity and probably slow—not suited to the hot defense of life and home. This suggests that at least some houses in the Caddoan area were, when Ranjel wrote, lower, with less steeply pitched roofs than were the majority of houses at La Salle's time and after. I believe these houses had rather low vertical walls and pitched pole roof structures which may have taken the form of a low dome. Thatch may already have been employed as covering from ground to top. Some of the houses may have been rectangular, but most were probably round.

Archeological Evidence

The archaeological evidence for such a change is virtually nonexistant, primarily because little work has been done on this particular problem. But there is some reason to suspect that something of the sort occurred; indeed, the archeological record for the prehistoric period is quite clear: successive changes in house types took place over a long period of time. How and why these changes took place is not so clear. Krieger (Newell and Krieger, 1949) noted such changes at the Davis Site and C. H. Webb (1959) anticipated some of my own ideas in his excellent coverage of the houses found at Belcher Mound. In order to attempt a fuller understanding of the problem, I think it necessary to summarize what is known about some of the houses found in the Mississippi drainage basin and to try to find some interrelationships among them. This will be done by known cultural units as defined by archaeological evidence in temporal sequence from earliest to latest.

Not a great deal is known about the building practices of the Tchefuncte culture of the Lower Mississippi Valley. The best evidence comes from the Lafayette Mounds, St. Martin's Parish, Louisiana

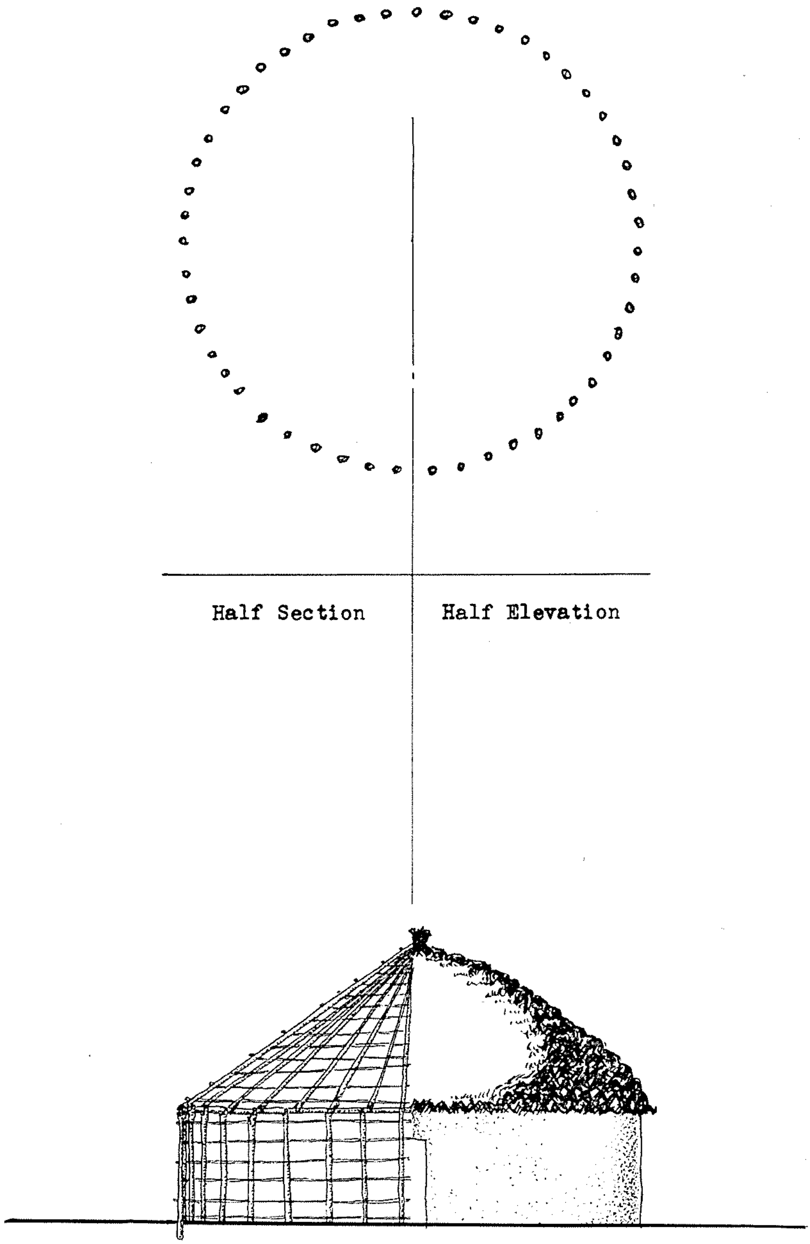

Fig. 1. Earliest Caddoan area house form, through Gibson Phase 1. Figs. 1–4 drawn to same scale.

(Ford and Quimby, 1945). These mounds were built in two superimposed stages over a group of houses which had previously occupied the site. The only remains of these houses were slight depressions in the submound surface, apparently dug to reach a clay layer, and post molds, some of which suggested circular patterns. At the time of publication, Ford and Quimby placed the Tchefuncte culture at a date possibly earlier than Adena. Whether or not they hold the same view in light of the revised Adena chronology brought about by radiocarbon dating is not known to me, but Tchefuncte is certainly very early in the Lower Mississippi area.

By contrast, the work of W. S. Webb and his associates has given us a clear picture of Adena houses, at least with respect to the ground plan of these houses. This information is summarized as follows (Webb and Baby, 1957: 112):

Early Adena—circular pattern with *vertical* posts fairly equally spaced

Middle Adena—circular pattern, probably beginning of paired posts, outward sloping

Late Adena—circular pattern with posts set in pairs, outward sloping

At the Dominion Land Company Site houses were found under mounds with upright wall posts set singly and with outward sloping singly set posts. The authors consider the former the earliest known Adena House (*ibid.*). In another report (Webb and Snow, 1945), rectangular houses with paired posts are noted. These are not placed in time, but according to the above outline, there is some reason to place them in the latter half of Adena history. Nearly all of these houses have floor diameters within a range of forty to sixty feet, and, with few exceptions, the post molds are within an inch of six inches in diameter. The later houses all had four posts forming a square in the center; these are not mentioned in the earlier houses.

Turning now to the Gibson Aspect, we find that all but one of the houses of the first phase at the Davis Site (Cherokee County, Texas) were round; the aberrant house was oval in plan (Newell and Krieger, 1949). These houses are twenty-one to fifty feet in diameter, with most post molds falling within a range of four to seven inches. The later phase 2 houses are almost all square or rounded square, ranging in size from 24 by 24 to 37 by 37 feet with three- to five-inch post molds. No centerpost holes were found in fifteen of the twenty-six first phase houses; all phase 2 houses had centerposts except House 35 which seems to have been a very specialized structure.

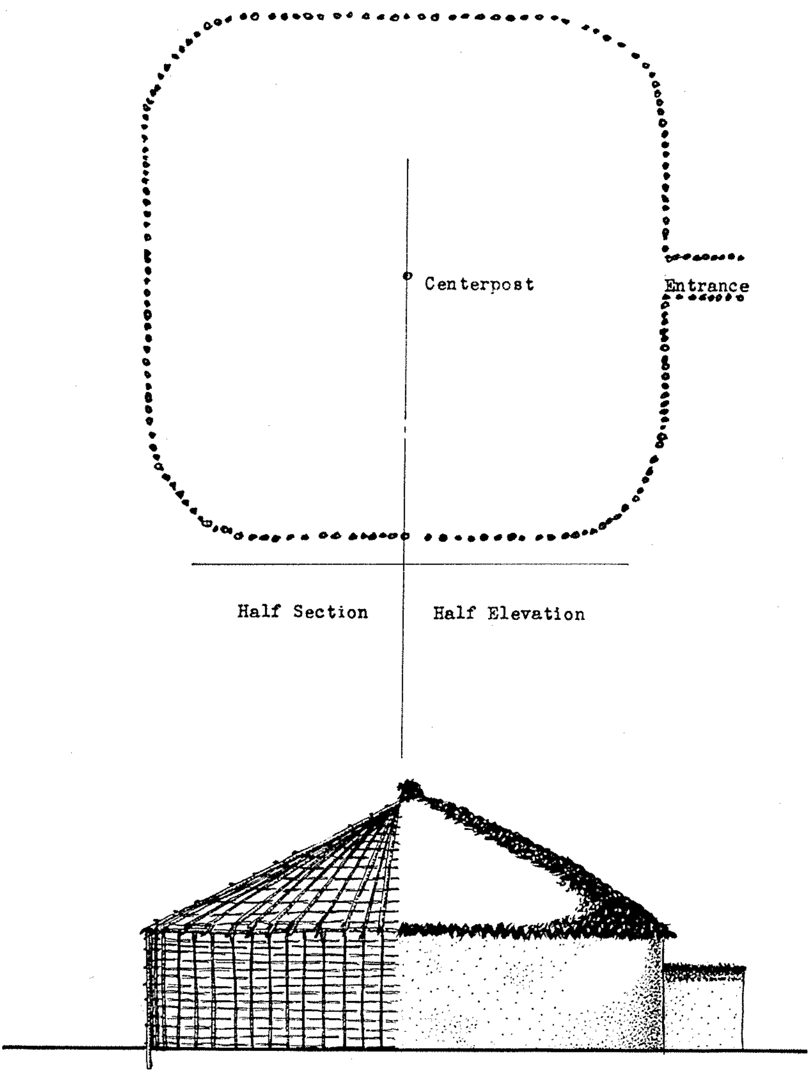

Fig. 2. Caddoan area house form, Gibson Phase 2.

Houses at Spiro, Oklahoma, may be summarized as follows (Orr, 1946):

Early Component—square with four centerposts
Middle Component—rectangular with four centerposts
Late Component—rectangular with two centerposts

The Belcher Mound presents an interesting sequence (C. H. Webb, 1959). Of the two houses attributed to the Belcher I period, one was rounded-rectangular with four- to six-inch posts set in trenches and had an extended entranceway; the other was small, circular without post trenches. Webb places this period in the late Gibson Aspect. Belcher II houses were small, circular, with three- to five-inch posts set individually. Belcher III, which Webb states may conceivably have existed until 1650, had circular houses thirty to forty feet in diameter with seven- to eight-inch posts, large center post molds and extended entranceways.

Analysis of Evidence

Unfortunately, not all site reports give as much information on the house forms found as do the Davis, Belcher, and Adena reports; many, in fact, are so vague in this respect that they could not be used in this paper. However, certain patterns can be discerned in what has been presented above. Most obvious, perhaps, is the fact that all of the earliest houses (Tchefuncte, Early Adena, Gibson Phase 1) are circular in plan with diameters close to thirty feet. They are found under mounds. Associated post molds are set vertically, are six inches or less in diameter, and there is no apparent relationship between size of house and size of post. Indeed, some of the largest houses have the smallest post molds. C. H. Webb (1959: 61) has made a similar observation: "South and west of the Red River, the earliest structures in the Gibson period, represented by premound patterns at Davis, Hatchel, and Keith sites, were circular, usually large, without projecting entranceway or organized roof supports. . . . Centerposts were used at times. . . ."

Rectangular houses appear later at Adena and Gibson sites. Spiro, which began in mid-Gibson times, apparently had this form from its beginning, with occasional intrusions of round forms very similar to those at Davis site. Centerposts of the Adena type appear at Spiro in the early phases but by Late Component times this pattern had been abandoned. Only two centerposts were used in this period.

It appears that the rectangular form was never adopted with enthusiasm below the Red River. This form never appears at some sites in this area, and at others is more often than not only partially a rectangular form in that the corners are usually rounded. House plan forms became round again in the Fulton Aspect, but the extended entranceway which had accompanied the rectangular intrusion into the area was retained, only to fade away after Belcher III–IV. Fulton

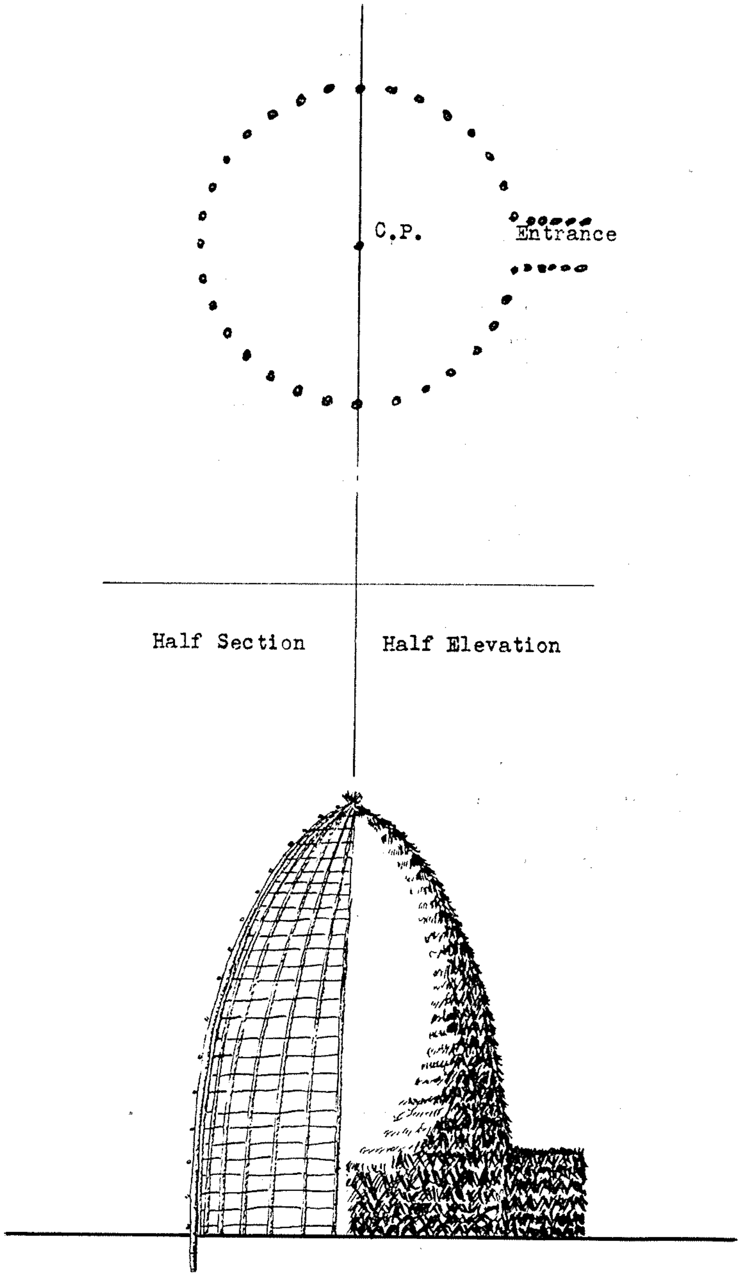

Fig. 3. Caddoan area house form, Fulton Aspect.

circular houses were usually smaller than earlier houses of this form, but post sizes apparently remained fairly constant. Circular houses became quite large again in the Belcher III–IV period, and post sizes apparently became significantly larger.

Historic references to houses in the Caddoan area give plan diameters up to sixty feet (Joutel, 1879) and heights of forty to fifty feet (Douay: in Shea, 1852). These sources are perhaps not entirely accurate, yet they suggest quite large structures. No mention is made of entranceways, other than doors, by any of the early writers.

It seems, therefore, that the following sequence obtained in the Caddoan area and that this sequence was related to similar occurrences in other areas.

I. Earliest houses through Gibson Phase 1 (Fig. 1)
   a) fairly large circular plan
   b) uniformly small posts set vertically
   c) centerpost sometimes present
   d) no extended entranceway

II. Gibson Phase 2 (Fig. 2)
   a) large rounded rectangular plan
   b) usually small posts set vertically
   c) centerpost usually present
   d) extended entranceways

III. Fulton Aspect (Fig. 3)
   a) small circular plan
   b) uniformly small posts set vertically
   c) centerpost present
   d) extended entranceway

IV. Protohistoric-Historic (Fig. 4)
   a) large circular plan
   b) uniformly large posts set vertically
   c) centerpost always present
   d) extended entranceway present early, then disappears.

The exceptions to this are Spiro, in the northern part of the area being considered, where rectangular forms are present throughout the occupation, and the southwestern section of Arkansas (Harrington, 1920), where both forms seem to be present in about equal numbers. This area is apparently a meeting ground for the two forms (Webb, 1959).

There is no need to suppose that the early houses were constructed in the same manner as were those of historical reference. I think the evidence I have presented gives good reason to believe that they were not. Figure 5 illustrates the obvious—larger beehive structures require longer poles than do smaller ones and, therefore, the lower part of the

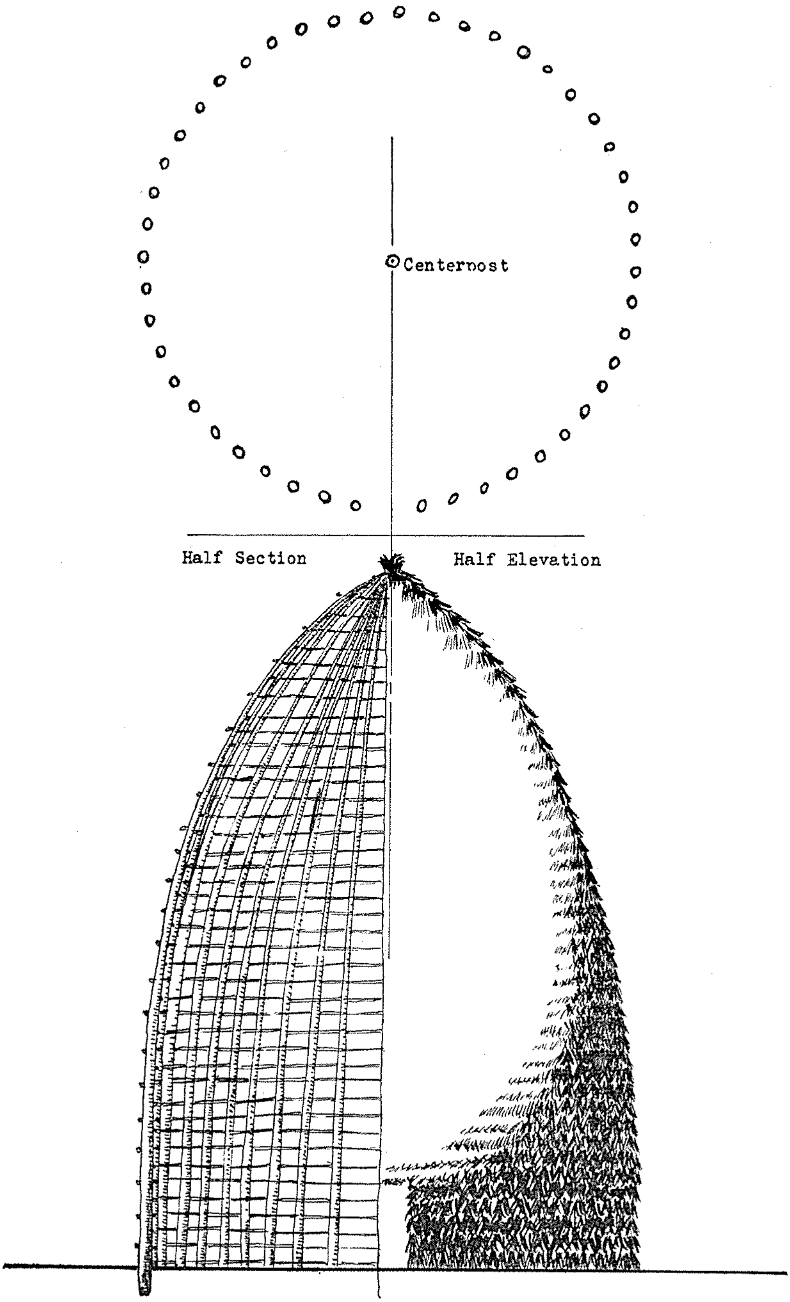

Fig. 4. Caddoan area house form, Protohistoric-Historic period.

tree trunks used (the part which leaves its mark as a post mold) in larger houses must necessarily be in a size range which is generally larger than that of smaller houses. Many structures of the early period were of such size that, if the bent-pole construction of historic times were used, trees forty to fifty feet tall would have to be used. The lower trunk diameter of these trees would certainly exceed the less than six-inch diameter of post molds common to archaeological sites of this period. I feel, therefore, that these early houses (Fig. 1) were constructed of vertical posts set into the ground and extending to a height perhaps as little as four to five feet, or as great as ten feet above the floor. These posts were secured by horizontal poles at their tops which, in turn, supported a roof of poles leaned and lashed together to form a pitched roof. Centerposts may have been used to support these roof poles until they were securely interconnected. Roofs were probably thatched and walls were probably wattle-and-daub. That no wall material of this type has been found with houses of this period offers no serious objection to this hypothesis. Few early houses show evidence of burning (therefore, no fired wall material can be expected) and many floor areas were apparently carefully cleaned before the area was reused.

Phase 2 houses (Fig. 2) were probably built the same way, except that rectanguloid plans and extended entranceways were adopted.

The Fulton period saw a return to the circular pattern (Fig. 3), but houses were frequently smaller than before. The building methods of the previous periods were probably retained in some cases, but it is likely that Caddoan bent-pole construction was used for the smaller houses whose archaeological remains consistently include centerposts. Davis (1958: 28) suggests that the shallow depth of one postmold pattern atop the primary mound at the Whelan Site may indicate a type of construction different from Caddoan bent-pole. This suggests the coexistence of vertical wall, pitched roof buildings and bent-pole types and may indicate that the latter form was first used for common, non-mound buildings. Theran's map (Bolton, 1915) of a Cadodacho settlement near Texarkana in 1691 tends to support this. The complete thatching of such a building could have been carried over into all building forms during this period.

The Protohistoric-Historic phase probably saw the full development of Caddoan bent-pole construction (Fig. 4) described by the early French and Spaniards. The large postmolds common to this period (*e.g.*, Belcher IV) suggest that this is so.

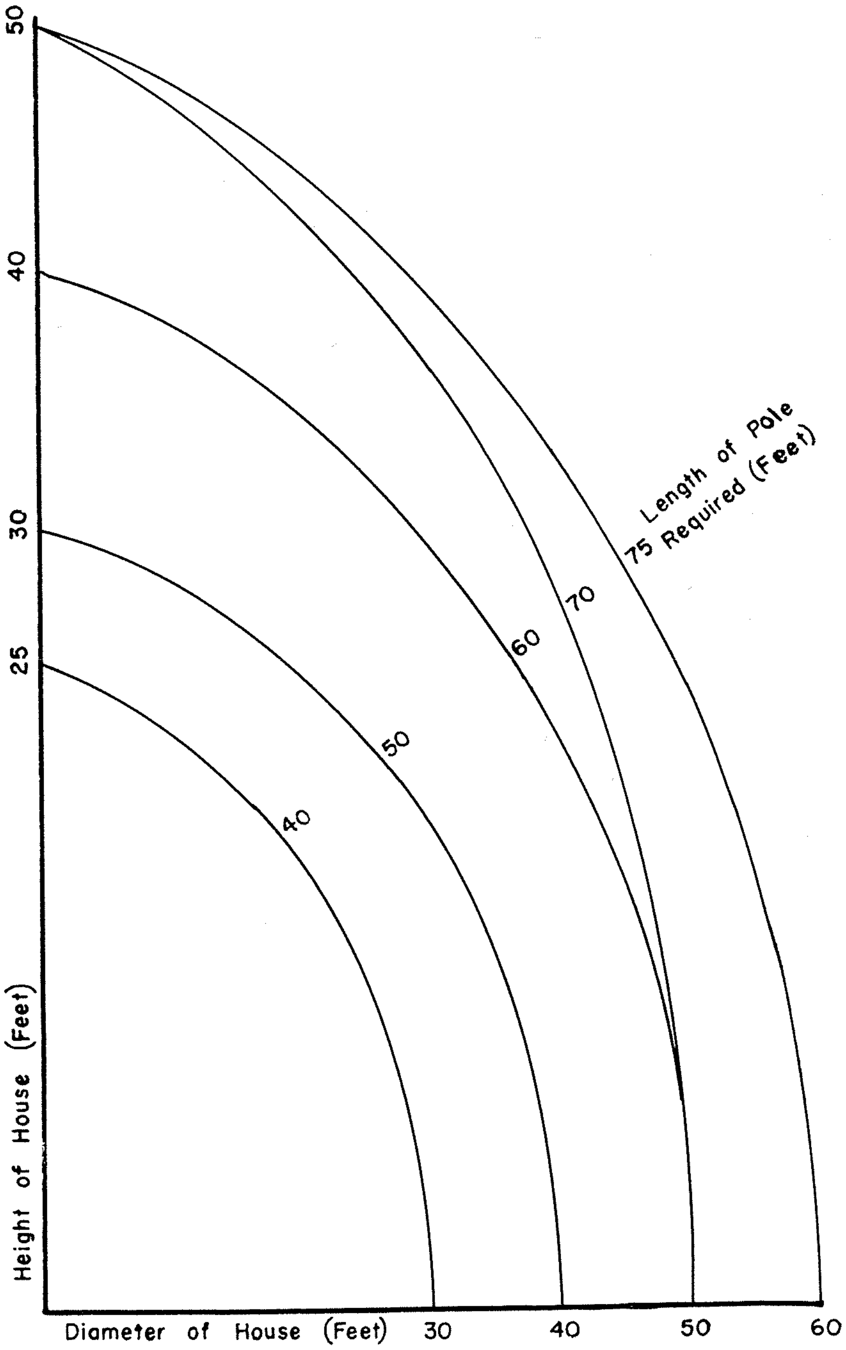

Fig. 5. Relation of pole length to house height and diameter in Caddoan area houses. Pole length is the height of tree required to supply the post for the house. Ten feet have been added to the length actually needed to allow for unusable portions at top and bottom of tree and for the two-to-three feet set into ground.

Relationship to Other Areas

I have previously shown that there appear to be some basic similarities in the house forms found in Tchefuncte, Early Adena, and Gibson Phase 1 sites. I feel that these similarities are not simply fortuitous but, rather, that they indicate some sort of contact between these areas at an early time and that this contact continued—perhaps with different centers of origin—at least until protohistoric times. Phillips, Ford, and Griffin (1951: 451) state, in summarizing their findings in the Mississippi Alluvial Valley, that they are "certain that the center for development is not in the Survey Area at all. In fact, we are becoming increasingly doubtful that a single center for this development exists anywhere." This can be extended to include the Caddoan area. The question, then, is: what was the nature of this contact and from whence came the house form ideas which it carried?

Griffin (*ibid.*) suggests that strong Meso-American influences were felt in the Cahokia area through the Gibson Aspect in East Texas, bypassing the Lower Mississippi Alluvial Valley, and subsequently diffusing down the Mississippi from Cahokia. There certainly seems to be grounds for assuming Mexican influences in early Texas. MacNeish (1947) lists forty-two trait similarities between the Huasteca and Gibson Aspect. Ekholm (1944) and MacNeish (1954) have found mounds in the Huasteca with suggestions of circular buildings similar to those found in the earlier periods with which this paper is concerned. Ekholm suggests that these structures are the earliest round forms in Mexico and that the trait diffused from that area. Both authors date these finds as contemporary with the Pre-Classic of the Maya. Orr (1952: 249) is of the opinion that the Southern Cult material appears to be earlier in the Caddoan area than it is in the east. It seems, then, that the possibility of the circular house form entering Texas from the Huasteca and radiating into the Adena and Tchefuncte areas is not too remote to be considered. The Gibson Aspect as now known probably post-dates this early contact, but may be a part of its later phases.

Willey (1955: 44) shows that some very interesting connections between North, Meso, and South America existed from very early times and suggests an interrelated rise of high cultures in Mexico and Peru, with a major period of exchange beginning circa 800 B.C. It is not entirely unreasonable to postulate a similar interrelationship between Mexico and the remarkably developed Adena culture at the same time, or perhaps a bit later, and perhaps a part of the same movement. After all, the Adena people had corn, and that, if nothing else, must have come from south of the United States.

Why this contact took place is beyond the scope of this paper to establish, but some speculation might be useful here. Evangelism does not seem to offer an answer; a group of teleconcerned priests sitting in Mexico awaiting the excruciatingly slow news from Ohio hardly seems likely. Military conquest seems unlikely; from the information we have there was nothing to conquer, and trade also seems unlikely for the same reason. A migration of peoples seems to be the best answer. It is perhaps worth considering that while such things as pottery, corn, art forms, and tools can be spread by trade among peoples without writing, a house must be built by someone familiar with its construction.

The rectangular form undoubtedly stems from the north where it is a very old established form. It is known from the earliest defined Eskimo cultures of Alaska, and appears throughout the northern area. Bennett (1952) describes the early houses of the northern Mississippi Valley as mainly rectangular, made of wattle-and-daub, and bark. The form may have diffused down the Mississippi Valley until it met the round form from Mexico. Bennett (1944: 21) describes the most striking characteristic of the Lewis Culture located at the mouth of the Ohio River as "a mingling of Southeastern and more typically Northern Cultures." Rectangular houses are attributed to this culture (Phillips, Ford, and Griffin, 1951: 445).

The sequence that emerges is this. A circular house form accompanies an early migration from Mexico to the Mississippi-Ohio Valley region and becomes established as the dominant form. A rectangular form enters the area from the north at a later date—probably also carried by a migration of minor dimensions—and exerts some influence, but becomes the dominant form in limited areas only (*e.g.*, Spiro and later Middle Mississippi cultures). Over a period of time these forms undergo local change and such forms as the Adena paired-post outward slanting style and the Caddoan bent-pole style emerge.

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The Limerick Site at Iron Bridge Reservoir, Rains County, Texas[1]

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Introduction

ABOUT 50 miles east of Dallas, Texas, on the Sabine River is the site of Iron Bridge Dam and Reservoir, now under construction by the Sabine River Authority. This, the first dam on the main stream of the Sabine, will flood lands located in Hunt, Rains, and Van Zandt counties, Texas. Its primary purpose is to provide a supplementary water supply for Dallas and other nearby cities.

A preliminary archeological survey of the Iron Bridge area was carried out in April, 1957, by the National Park Service (Johnson, 1957). Of the 22 sites located during the survey, 10 appear to be Archaic or non-ceramic sites and 10 are ceramic sites. The nature of the other two sites has not been determined. In his report of the survey, Johnson (1957) recommended that four of the sites be excavated or extensively tested.

Under a coöperative agreement with the National Park Service, a field party of the Texas Archeological Salvage Project was sent to Iron Bridge early in August, 1958, to begin the recommended salvage excavations. Three sites, all situated on the east bank of Hooker Creek near its mouth, were selected for investigation. These are the Limerick Site (41RA8), a small but relatively rich ceramic site of the prehistoric period; the Harkey Site (41RA11), also a small prehistoric ceramic site; and the Pearson Site (41RA5), thought to be the location of a vil-

[1] The archeological investigation of the Limerick Site was carried out by the Texas Archeological Salvage Project as a coöperative project of the National Park Service and The University of Texas. The following report was accepted by the National Park Service in September, 1959, in partial fulfillment of the terms of Contract No. 14–10–333–422 between The University of Texas and the National Park Service.

lage of Tawakoni and Yscanis Indians mentioned in 18th century Spanish documents (Johnson and Jelks, 1958).

Brief testing at the Harkey Site produced practically no cultural material; consequently, it was decided that intensive excavation of the site was unwarranted. An attempt to sink test pits at the Pearson Site proved impractical since the black gumbo soil there was dry, extremely compact, and virtually impenetrable at that season of the year. Therefore, excavation of the Pearson Site was rescheduled for the fall of 1959 when field conditions should be at an optimum.

With the Harkey and Pearson Sites eliminated from consideration, the full season at Iron Bridge—from August 4 to September 1—was devoted to work at the Limerick Site. The site was not completely excavated, but a number of squares and short trenches were dug in the four major areas of concentrated cultural material, and it is believed that a representative sample of archeological data was obtained for the site as a whole. The excavations were supervised in the field by the writer under the general direction of Edward B. Jelks.

The following report describes the Limerick Site, the extent of the excavations, the artifacts recovered, and the provenience of the artifacts. Analysis of the data has revealed that the site was occupied over a considerable period of time, first by pre-ceramic peoples of the Archaic Stage and later by a Neo-American culture closely related to the Sanders Focus.

Acknowledgments

From its inception to the final report, this investigation has been aided by the coöperation of many individuals and organizations. While it is impossible to give specific acknowledgment to all, their coöperation and participation are greatly appreciated. For those who more frequently were burdened with the problems which constantly arose, special mention is due.

The assistance of various officials of the Sabine River Authority was invaluable. They granted permission to dig on land under their jurisdiction, gave access to aerial photographs and maps of the area, and did many favors, both large and small, for which they receive my deepest appreciation. Members of the Texas Archeological Salvage Project gave much time, service, and advice to the study. Chief among these was Edward B. Jelks, in charge of the project, whose aid in the way of suggestions, discussions and encouragement in all phases of the study has been especially helpful. LeRoy Johnson, Jr., provided unpublished information regarding related sites in the Iron Bridge area

that has been of great value. My thanks also extend to William A. Davis, field foreman, whose supervisory ability and technical skill contributed substantially to the successful completion of the dig.

Previous Work in the Area

The absence of published material on the archeology of the area immediately surrounding the Iron Bridge Reservoir does not reflect a lack of previous excavations in the area. The Yarbrough Site, located near Grand Saline, about twenty miles southeast of the Limerick Site, was completely excavated by a University of Texas-Works Progress Administration crew in 1940, but no report of this work has been published. This site yielded a large sample of artifacts which are very similar to those from the Limerick Site (LeRoy Johnson, Jr., personal communication).

Major excavations to the north and west of the Iron Bridge Reservoir have been published. Krieger (1946) defined the Henrietta Focus, with the type site, the M. D. Harrell Site, in Young County approximately 160 miles to the west of the Iron Bridge area. In the same publication he described the Sanders Focus, with the type site, the T. M. Sanders Site, located in Lamar County, about 65 miles to the north of the Limerick Site. Bell (1958a) reported the Boat Dock Site in Marshall County, Oklahoma, northwest of the reservoir. Stephenson (1952) defined the Wylie Focus with sites located in Collin, Rockwall, and Kaufman counties immediately to the west of the Limerick Site, while Crook and Harris (1952, 1954) defined the Carrollton and Elam foci, sites of which are located primarily along the upper Trinity River in Dallas County. Suhm, Krieger and Jelks (1954: 74–98) presented a summary of the general area.

Major reports of work to the east of the reservoir area have been published. Krieger (1946) discussed pottery found in various East Texas foci of the Gibson and Fulton Aspects. Newell and Krieger (1949) reported on the Davis mound of the Gibson Aspect in Cherokee County to the southeast of Iron Bridge Reservoir. Tentative identification of an East Texas Aspect of the Archaic Stage was published by Suhm, Krieger, and Jelks (1954: 148–151).

Environment

Cowleach Fork and Cedar Creek, with their headwaters respectively in Collin and Fannin Counties, Texas, join in Hunt County to form the Sabine River. Hooker Creek, on which the Limerick Site is located, empties into the Sabine in Rains County. The Sabine from its origin flows in a wide arc across eastern Texas and eventually empties into the Gulf of Mexico. The waters begin their flow in a southeasterly direction, then gradually trend toward a more southerly direction as they progress downstream. From the southeast corner of Panola County, Texas, to its mouth the Sabine forms the boundary between Texas and Louisiana, and from Panola County to the Gulf of Mexico its course is generally southward. Along its headwaters, where the Iron Bridge Reservoir is under construction, the Sabine is a small stream with a broad floodplain composed for the most part of arable, black gumbo soil. Gullies of various sizes dissect the land, and aerial photographs of the area show scars left by gullies which were incised in the floodplain and later filled by alluviation. At the outer edge of the floodplain the ground rises slowly to form low, rolling hills which provide a border for the floodplain and create the characteristic upland topography of the area.

The Iron Bridge region is included in the West Gulf Coastal Plain physiographic province of Fenneman (1938) and in the Gulf Coastal Plain of Atwood (1940). In general, the Gulf Coastal Plain is characterized by Atwood as follows:

> Low ridges parallel the coast line in Alabama, Mississippi and Texas, and each ridge is bordered on the landward side by a lowland belt. (Atwood, 1940: 25)

The Limerick Site lies just within the eastern edge of the Black Prairie district, one of the lowland belts which is bordered on the southeast by the Nacogdoches Escarpment and on the northwest by the White Rock Escarpment (Fenneman, 1938: Fig. 27).

The rolling hills bordering the floodplains of Hooker Creek and the Sabine River are covered with prairie grasses and, in some areas, deciduous trees. The grasses and trees are characteristic of the Texan Biotic Province of Dice (1943: 24), within which the Limerick Site is located. Dice describes the Texan Biotic Province as follows:

> Gently rolling plains are characteristic of all the Texan. Forests of oak and hickory often grow on sandy soils here, whereas the heavier soils are usually covered by prairie.
>
> The prairies of the Texan province are dominated by various grasses . . . Perennial flowering plants are also abundant. The trees of the province are chiefly oaks and hickories of which the most important are post oak

(*Quercus stellata*), black jack oak (*Q. marilandica*), and Texas hickory (*Carya buckleyi*).

The winters are short and relatively mild, the summers, long and hot. The precipitation is considerable and falls mostly during the long growing season (Dice, 1943: 24).

The geology in the vicinity of the Limerick Site is complicated by the fact that there are two outcrops of the Midway group in that part of Rains County. One outcrop, the Kincaid formation, underlies the second, the Wills Point formation (Sellards, Adkins, and Plummer (1932: 532, Fig. 32). According to Sellards, Adkins, and Plummer (1932: 546) the soils of the Kincaid formation are

> . . . yellowish green at the base and grade upward into black at the surface. . . . They are yellower, darker, and more calcareous than the Wills Point. . . . Small black nodules streaked with gray lines characterize certain parts of the Kincaid beds and do not occur in adjacent beds.

Concerning the Wills Point formation they state,

> The soils of the Wills Point formation are lighter in color, more silty, much less calcareous, and less colloidal than those of the Kincaid . . . outcrops. (Sellards, Adkins, Plummer, 1932: 564.)

The profile data from the Limerick Site indicate that the soil in the upper areas was a dark gray, sandy soil which overlay a light gray sandy soil. The latter was mottled with light gray and/or whitish sand. Generally, a sandy clay, yellowish in color and containing small dark orangish and gray nodules, underlay the grayish soils.

A comparison of the characteristic soils of the Kincaid formation and Wills Point formation with soil profile data from the Limerick Site suggests that the site is probably situated on the Kincaid formation of the Lower Eocene. This identification is tentative and a detailed analysis of the soils in the vicinity would be required for positive identification of the formation.

Description of the Site

The Limerick Site is located on the floodplain of Hooker Creek, about 2.5 miles above its point of juncture with the Sabine River and about 8.5 miles south of the town of Lone Oak, Texas (Fig. 1). The site was named for the landowner, Mrs. Adine Limerick. Formerly trees characteristic of the bottom lands grew on the site, but in the 1920's the land was cleared and put into cultivation except for a small area consisting of two small knolls connected by a low saddle. In 1955, the trees on the knolls were cleared and the entire field was used for farming.

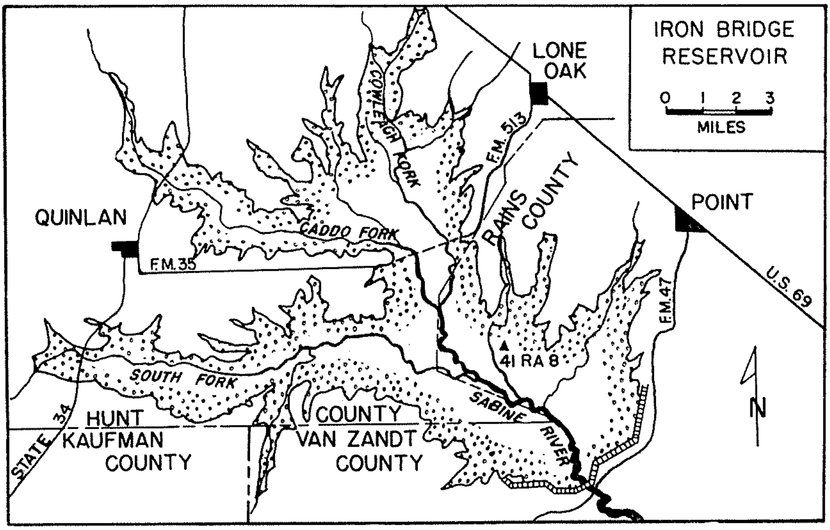

Fig. 1. Iron Bridge Reservoir. The Limerick site is designated 4 1 RA8.

The site is large, and cultural debris is found on the surface over an area of approximately 75 acres on and around the knolls. There are, however, several distinct locations within the site where the cultural materials are concentrated. These areas of concentration constitute a distinctive feature of the site.

The two main areas of concentration are on the two adjacent knolls. The knolls are in the form of slightly irregular ovals with gradually sloping sides. In the fields surrounding these knolls are many grayish or tan-brown sandy spots, irregular in shape and size, which contrast distinctly with the surrounding black gumbo soil of the floodplain. Cultural debris is concentrated in and on these sandy areas, but the black gumbo soil between the sandy spots is virtually devoid of cultural remains.

Since the cultural materials were concentrated in areas and had a discontinuous distribution, various portions of the site were given letter designations. Thus A and B were assigned to the two knolls, and C and D were assigned to two of the larger sandy areas located to the southwest of the knolls (Fig. 2). All of the test excavations at the Limerick Site were carried out in those four areas.

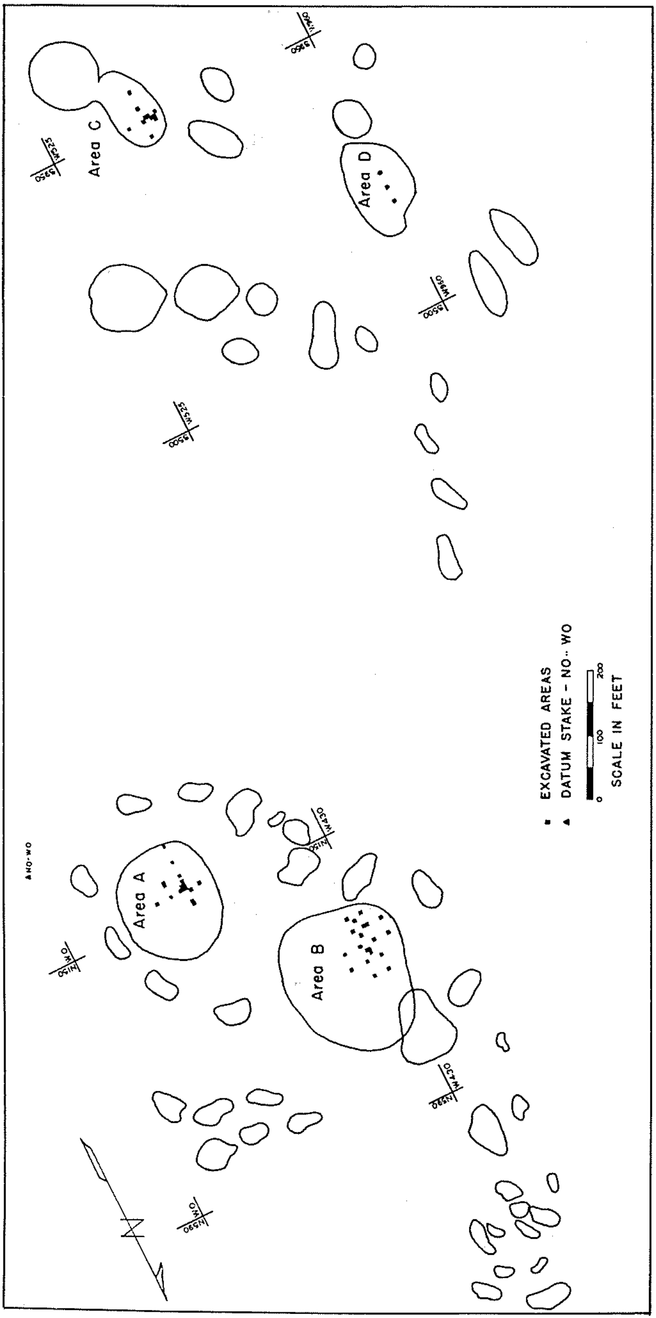

Fig. 2. Plan of Limerick site, showing locations of sandy spots and excavated areas.

Soil profiles of the site reveal a superficial zone of gray, humus-stained sand overlying a zone of yellowish, sandy clay. The top few inches of the sand member has been disturbed by plowing. In the lower part of the humus zone the soil tends to be mixed with clay from the underlying zone and is relatively compact. The clay member is very compact and contains many small, dark, orangish nodules. The black gumbo was encountered occasionally below the surface at the edges of the areas of occupation. Occupational debris tended to be in the plow and humus zones, but was generally absent in the clay and gumbo soils.

Excavation and Recording Methods

A grid system using a basic unit of five-foot squares was superimposed on the site. In order to keep the major part of the site within the western half of the grid, a zero line or base line, oriented on magnetic north and south, was laid out on the east side of the site. An arbitrary datum point on this line was designated as the north zero—west zero (N0-W0) point. All stakes were numbered with a north or south designation expressed as the direction and distance (in feet) from the zero stake. For example: a point 150 feet north of the N0-W0 stake and 25 feet west of the north-south base line was designated as N150-W25. Test squares were labeled with the coördinates of the stake located at the southeast corner of the square. All elevations were related to the N0-W0 datum point, which was given an arbitrary elevation of 100.0 feet at the top of the stake.

Areas A, B, C, and D were tested by sinking five-foot squares spaced at varying intervals. Profiles were recorded at each square excavated and these were later combined to obtain an overall profile. In recording profiles, the elevation at the ground level of the stakes involved was used in plotting the surface contour on the profile sheet and this line served as a reference line.

In order to gain quick comprehension of the subsurface structure of the site as a whole, a post hole digger was used to determine soil stratigraphy. Surface elevation and profile data were recorded for each hole excavated in this manner. Use of the post hole data enabled the profiles to be extended horizontally as well as vertically and also helped in locating areas where there seemed to be the greatest chance for cultural stratigraphy.

In order to obtain a representative sample of materials from the site, a series of exploratory five-foot squares was dug in each of the tested areas, no extensive trenching being attempted. When a test pit indicated that possible features might lie in an adjoining square, it was excavated also. If the material found in a test pit suggested that it was in an area of concentration, adjoining squares were opened. Test pits were excavated either to the underlying sandy subsoil or to soil which was sterile of cultural remains. Since the testing in Area B promised to provide the best stratigraphic sequence at the site, the majority of the work was conducted in that area.

Generally, excavations were by six-inch levels; however, in some cases three-inch levels were used in order to gain a closer stratigraphic control. Occasionally levels of less than six inches were used when the bottom level of the soil containing cultural debris rested on extra hard sterile clay. The topmost level, from ground surface to one-half foot below the ground surface, was designated as level one; from one-half foot to one foot below ground surface, level two, etc.

Excavations were carried out by a crew of six men including the field archeologist. All dirt was shoveled from the test pits onto a half-inch mesh screen. The dirt was sifted and the cultural debris removed and sacked. On each sack were recorded the site number and name, square designation, level number, distance below the surface, date, and excavations. In addition to the artifact provenience, field data were recorded in the form of photographic records, daily log, site journal, square and level reports, profiles, contour maps, and maps showing areas of excavation. The excavations carried out in each of the areas are described in detail in the following sections.

Artifact Description

A total of 853 artifacts was recovered from the excavations at the Limerick Site. Sherds comprise slightly more than half of this total and chipped stone specimens make up the rest. Most of the specimens were concentrated in Areas A and B where nearly all the sherds were found.

The specimens were first sorted according to the areas in which they were found. They then were divided into two classes—chipped stone and ceramic. These classes were further subdivided into groups —projectile points, scrapers, knives, drills, etc.—and in many cases these groups were further subdivided into still smaller categories. After the final sorting into small groups—each group containing only those specimens which closely resembled one another in form—individual groups were identified with previously defined types wherever possible.

After the division of the specimens into classes, the criteria progressively became more arbitrary with each further subdivision. As a result, if other investigators should classify the same material separately by this system, the end groups would probably be somewhat different from those resulting from the present analysis. This approach to classification of artifacts from a site attempts to minimize the use of previously established type descriptions in the initial sorting. There are several interrelated reasons for this.

(1) An analysis based on published descriptions assumes that the types are valid, an assumption which is not always well founded. Many types have been established, published, and later revised or completely dropped. As a result, the validity of any analysis based on preconceived types would be dependent upon the continued acceptance of those types.

(2) An overdependence on previously established types in the initial sorting may result in an initial "pigeonholing" of a group of artifacts which actually has significant variations of form within the group; in such a case the variations might not be recognized because the typological classification used was based on other criteria.

(3) Since the Archaic Stage in East Texas has only been tentatively defined, specific artifact forms associated with the stage are vaguely known. Rather than impose a preconceived typology on an undefined culture complex, it was considered better methodology to sort the artifacts into small groups of closely related specimens, and to avoid typological assignment of any such group unless it conformed *in detail* to published definitions of a recognized type.

One artifact "type" which had been affected by "pigeonholing" analysis is the Gary dart point. Recently Gary has been redefined on the basis of variations within the group, and sub-groups or varieties have been described by several investigators. Baerreis, Freeman, and Wright (1958) have divided Gary points from sites in Oklahoma into three varieties, Gary A, B, and C, and have demonstrated that these varieties indicate temporal changes within the type. Ford and Webb (1956: 52–53) in refining the Gary classification, classified Gary points from the Poverty Point Site as Gary Typical, Gary Small, Gary Large, and Gary Long. A special study made by Webb using length as a criterion, suggested that Gary points in Louisiana decrease in size from early to late archeological horizons (Ford and Webb, 1956: 53–54).

Projectile Points

On the basis of size and manufacturing techniques, projectile points recovered in the excavations at the Limerick Site were divided into two groups—dart points and arrow points. The dart points, which are generally larger than the arrow points, were made primarily by percussion chipping or by a combination of percussion and pressure techniques. The arrow points were made by pressure chipping. The usual practice in making arrow points was to shape them from small thin flakes, while dart points were manufactured predominantly from thicker flakes or small cores.

Using these criteria as a basis, the points were divided into the two groups, using only those specimens which were whole or complete enough to enable them to be further subdivided. A total of 152 specimens was placed in the dart point group, while 80 specimens were classified as arrow points. For the most part, only those artifacts found during the excavation are included in the analysis, since those recovered by the initial survey were not designated according to the area of the site in which they were found.

Each group was then further subdivided on the basis of similarity of base, stem, and/or blade forms. Since only a small number of the points fit well into previously defined typological categories, the points will be described in the following pages on the basis of shape and will be given letter and number designations for convenience in reference. For dart points, the letter "D" is assigned and for arrow points, the letter "A" is used. When a shape is the *same* as that of an established type, this will be noted. The term "shape" is used to describe an empirical grouping based on the overall appearance and dimensions of the points. Groupings of this nature are intended to be purely descriptive categories and are not on the same level as types.

Dart Points

Dart points were first classified by stem shape. The majority have contracting stems characteristic, in a general way, of the Gary type. This group, however, lacks internal consistency, and clusters of points with consistent, distinctive features could be segregated within this general category. These clusters were described as individual subgroups of the general Gary tradition.

The criteria used in segregating the subgroups were based on similarities of (1) the point as a whole, (2) similarity of the component parts and (3) their relationships. Characteristics of the point as a whole include overall shape, size, workmanship, etc., while the component parts and their relationships include the shapes of the edges of the blade, shape of base and stem, and the proportions and dimensions of various parts of the point.

Of the 28 categories of dart points, five were assigned previously defined type names, while the others were designated by the letter "D" followed by a number designation for each separate category. For the first 15 categories the letter "D" is preceded by "Gary", indicating that each of the categories fits into the Gary tradition. The following dart point forms are included as part of the Gary series.

Gary D1 (Fig. 3), 62 specimens, from all areas of the site.

LeRoy Johnson, Jr., when conducting the site survey of the Iron Bridge Reservoir, recognized this form as being a distinctive one and described it as follows:

> This type includes points similar to the Gary type except that they are much smaller than allowed in the definition of Gary points by Suhm, Krieger, and Jelks (less than 4 centimeters in length), yet are too thick and heavy to be considered arrow points. These artifacts likewise resemble Wells points strongly in that the stem is often half the length of the entire point. Here again, however, these points fall below the defined length range for Wells points (Johnson, 1957: 7).

The average point of this shape is about 3.2 cm. long, 1.7 cm. wide, and has a stem length of 1.2 cm. The length may vary from about 1.9 to 5.0 cm., while the maximum width at the shoulders ranges from 1.2 to 2.3 cm. Stem length varies from .8 to 1.7 cm. Generally this form has well defined shoulders and a tapering stem characteristic of the Gary type. Some have tapering stems which terminate in a flat base, others have somewhat bulb-shaped stems with a slightly rounded base, while others have tapering stems with pointed bases. It is not known whether these variations in the base and stem are culturally significant or merely a result of minor variations in the stone and/or workmanship. Similar forms were found in Wylie Focus sites (Stephenson, 1952: Fig. 95, A, second and third from the left) and at the Boat Dock Site in Marshall County, Oklahoma (Bell, 1958a: Pl. 11, E). The proportions of these points are different from the Gary Small group as illustrated in the Poverty Point report (Ford and Webb, 1956: Fig. 17, n, o, p).

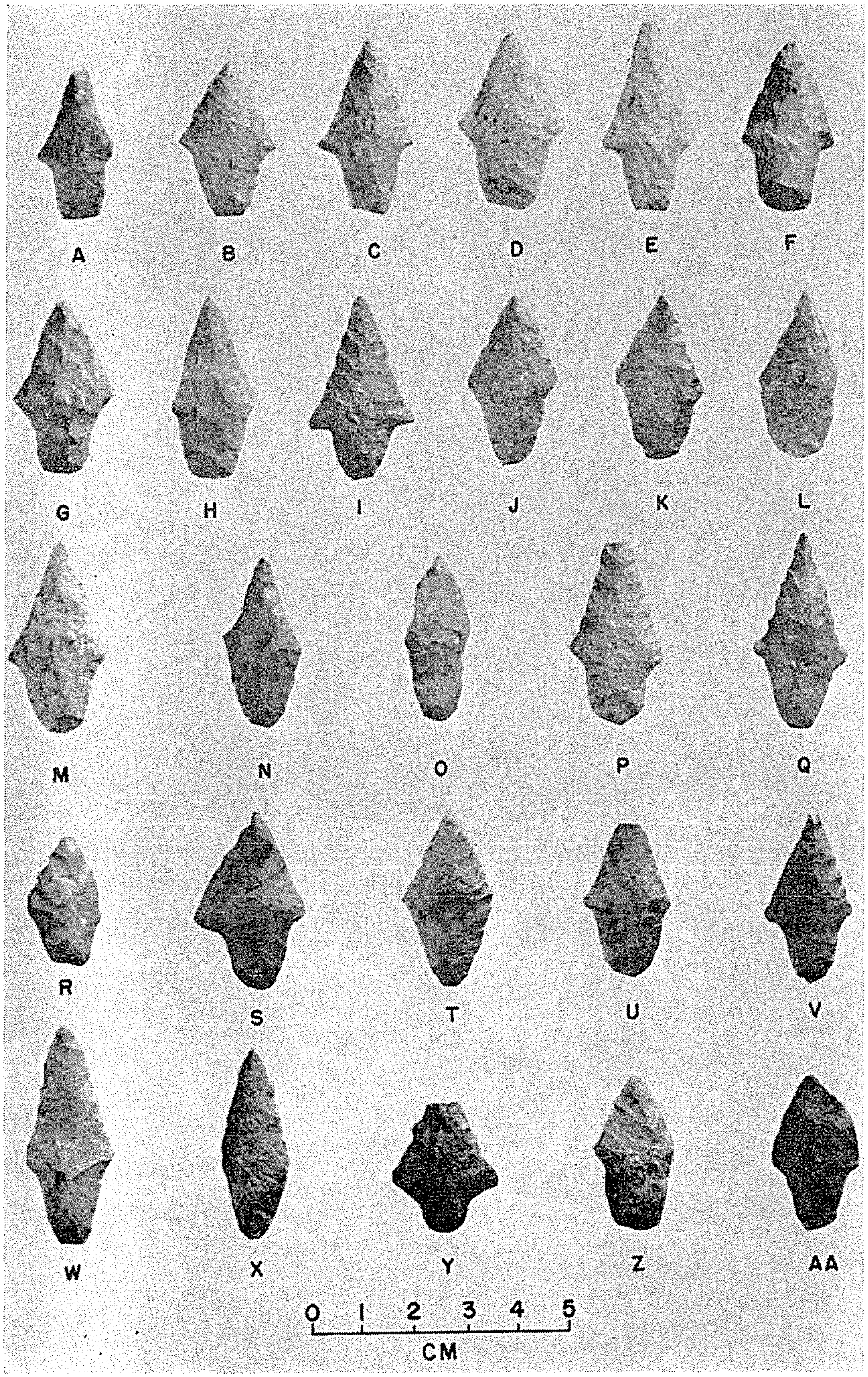

Fig. 3. Gary D1 dart points from the Limerick site.

Gary D2 (Fig. 4, A-E). 11 specimens, from Areas A, B, and C.

This Gary form has a triangular blade with edges that are generally straight but may be concave or convex. The stem contracts to a rounded or, occasionally, a pointed base. The shoulders are prominent. The dimensions of this form vary considerably—the length ranging from 3.9 to 5.5 cm., the width varying from 2.1 to 3.4 cm., and the stem length measuring from .9 to 1.7 cm. The majority have stems which are about 1.35 cm. long. This form appears to be the same as Gary variant A of Baerreis, Freeman and Wright (1958); however, the Limerick Site specimens are generally smaller than the ones reported from Oklahoma. Specimens of this form have been found in the Addicks Basin about 20 miles west of Houston (Wheat, 1953: Pl. 36, j).

Gary D3 (Fig. 4, F-H). 10 specimens, from Areas B and C.

The stem on this form, which is broader than that of Gary D2, tapers gradually to a rounded base. Pointed bases do not occur in this form. The shoulders are usually slight but distinct, although on some specimens the shoulders merge with the stem. The blade is triangular with more or less straight edges. The length of the Gary D3 points is between 4.3 and 4.7 cm. with the width of the majority ranging from 1.8 to 2.2 cm. The length of the stem varies from 1.2 to 1.7 cm. While this form resembles the Gary B variant of Baerreis, Freeman and Wright (1958), it is generally smaller than those defined as Gary B. Similar points have been found in Wylie Focus sites (Stephenson, 1952; Fig. 95, A, fifth from left), in the Addicks Basin (Wheat, 1953: Pl. 36, b, f, g,) and at the Boat Dock Site (Bell, 1958a: Pl. 11, F).

Gary D4 (Fig. 4, I-J). 6 specimens, from Areas A and C.

These points have triangular blades with straight to slightly convex edges; the bases are rounded to pointed and the stems are relatively broad and short (average length 1.3 cm.) on all except two of the specimens. The pointed bases occur on those specimens which have the narrow stems. This group as a whole seems to be consistent on the basis of size (overall length ranges from 4.1 to 5 cm., and the average width is 3 cm.) and crude chipping techniques. They resemble points found at Addicks Basin (Wheat, 1953: Pl. 36, a, c, k, l, m) and at the Boat Dock Site (Bell, 1958a: Pl. 11, A).

Gary D5 (Fig. 5, A-B). 13 specimens, from all areas.

This form is distinctive, although there is considerable variation within the sample. In general, the entire point is an elongated oval

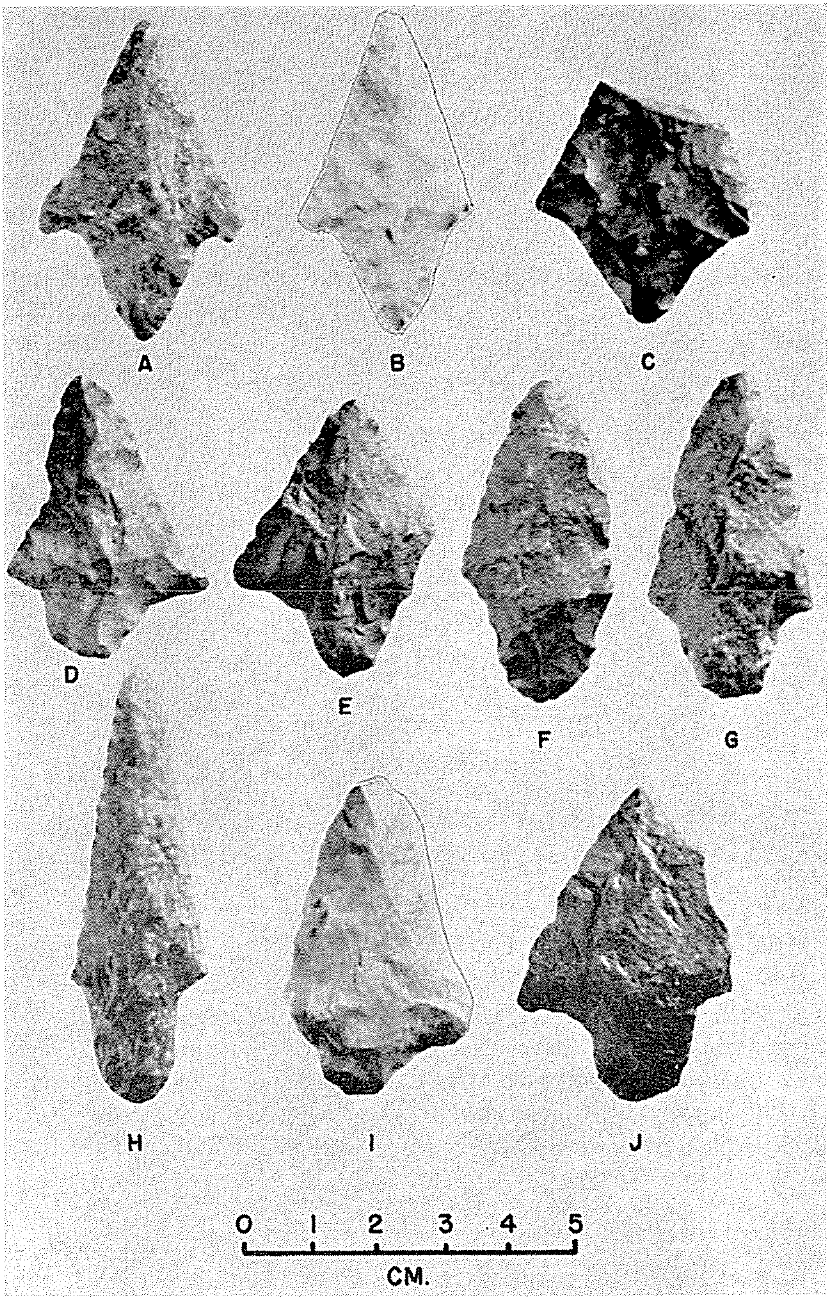

Fig. 4. Gary dart forms from the Limerick site. D2: A-E; D3: F-H; D4: I-J.

shape with an average length of 4.0 cm. Some of the specimens are widened in the shoulder area, creating a lozenge shape. The average width of this form at the shoulders is 2.2 cm. The stems are tapering and are not distinctly differentiated from the blades except on those specimens with widened shoulder areas. On this form the stem tapers sharply and terminates in a rounded base, which is also one of the characteristics of the form. Gary D5 resembles in general shape, but definitely not in size, the Gary C variety as defined by Baerreis, Freeman and Wright (1958: 69). It also has certain characteristics in common with the Desmuke point (Suhm, Krieger, and Jelks, 1954: 416) but differs from Desmuke in that the edges of the blade are commonly convex rather than straight and the blade is never beveled.

Gary D6 (Fig. 5, C-D). 7 specimens, all from Area C.

This form includes a series of small (2.8 to 3.7 cm. long) dart points with triangular blades and well-defined shoulders. The stem varies from a narrow, slightly tapering shape to one having parallel sides. The base is straight, slightly rounded, or convex. These may be variations of the small Gary D1 form, but they have narrower stems. This form is similar to the Wells type (Suhm, Krieger, and Jelks, 1954: 488) but is much smaller. Similar points have been found at the Whelan Site in Marion County, Texas (Davis, 1958: Pl. III, A, 19, 20).

Gary D7 (Fig. 5, E). 2 specimens, both from Area C.

Gary D7 closely resembles Gary D6 except that this form has barbed shoulders. These points are about 3.3 cm. long and 2.3 cm. wide.

Gary D8 (Fig. 5, F). 3 specimens, all from Area B.

The Gary D8 form has a long, tapering stem which terminates in a pointed base, and has well-defined shoulders on a basically triangular blade. The one complete specimen is 4.1 cm. long, 2.3 cm. wide and has a stem length of 1.6 cm. The general shape is the same as that of points associated with Wylie Focus sites to the west of the Iron Bridge Reservoir (Stephenson, 1952: Fig. 95, A, second from right and first from left).

Gary D9 (Fig. 5, G). 3 specimens, all from Area A.

These points have relatively long, narrow blades and slightly protruding shoulders. Overall length ranges from 4.8 to 5.0 cm. and the

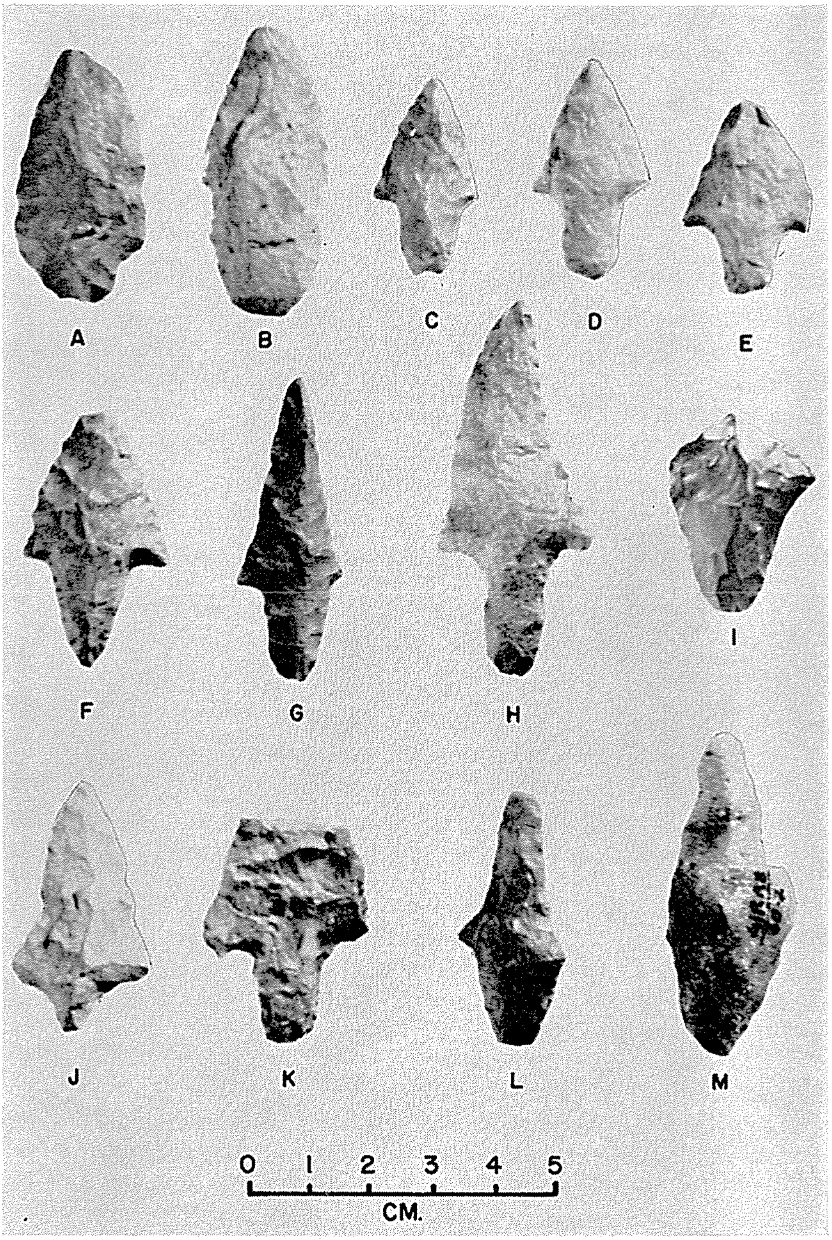

Fig. 5. Gary dart point forms from the Limerick site. Gary D5: A-B; Gary D6: C-D; Gary D7: E; Gary D8: F; Gary D9: G; Gary D10: H; Gary D11: I; Gary D12: J; Gary D13: K; Gary D14: L; Gary D15: M.

width varies from 1.7 to 1.9 cm. The long, narrow stem tapers slightly and terminates in a round or straight base.

Gary D10 (Fig. 5, H). 1 specimen, from Area A.

An asymmetrically shaped blade and a long stem give this point a distinctive appearance. The shoulders are prominent (2.7 cm. wide) and the base is rounded. This point resembles Gary D6 and Gary D7, differing from them in the relatively long stem (1.9 cm.), the total length (5.9 cm.), and the long, asymmetrical blade.

Gary D11 (Fig. 5, I). 1 specimen, from Area B.

The short, stubby blade of this specimen suggests that it may be a reworked Gary. Only one shoulder is present, and the width in the shoulder area is 2.4 cm. The tapering stem, which terminates in a convex base, is much longer than the blade, comprising about two-thirds of the length of the entire point. The total length of the point is 3.1 cm.

Gary D12 (Fig. 5, J). 1 specimen from Area B.

This form has a short, pointed stem and recurved edges on the blade. The point is 4.0 cm. long and the prominent shoulders are 2.2 cm. wide.

Gary D13 (Fig. 5, K). 1 specimen, from Area C.

The narrow, slightly tapering stem of this specimen terminates in a rounded base. The prominent shoulders (2.8 cm. wide) are slightly barbed. Most of the blade is missing, but the remaining portion suggests the original blade was triangular with straight edges.

Gary D14 (Fig. 5, L). 1 specimen, from Area C.

This point, which features a tapering stem and rounded base, appears to be a reworked Gary. The well defined shoulders measure 1.8 cm. across. The total length of the point is 4.2 cm. This specimen may have been used as a drill.

Gary D15 (Fig. 5, M). 1 specimen, from Area C.

This point has a crudely chipped, irregular shaped blade. The edges of the blade grade imperceptibly into a tapering stem, no definite shoulders being present. The length of the point is 5.2 cm. and the width is 2.1 cm. The base on this form is slightly pointed.

The following dart point forms are either unstemmed or have stems which differ from the Gary contracting stem series.

D16 (Fig. 6, A). 1 specimen, from Area A.

This point, 4.4 cm. long and 1.4 cm. wide, has a long, narrow blade with straight edges. The stem is undifferentiated from the blade on one lateral edge of the point, and on the other edge a small notch located a short distance above the rounded base sets the stem area apart from the blade. The base is rounded. The point, in some characteristics, resembles the form defined as Palmillas (Suhm, Krieger, and Jelks, 1954: Pl. 110).

D17 (Fig. 6, B). 1 specimen, from Area A.

This form is triangular with slightly convex sides and a straight base. It is 4.3 cm. long and the maximum width is 2.6 cm. This specimen could possibly be classified as a triangular knife.

D18 (Fig. 6, C). 1 specimen, from Area A.

The surviving portion of this fragmentary specimen suggests that it had a triangular blade with straight edges. The prominent shoulders are 3.1 cm. wide and have very slight barbs. The stem expands and the base is slightly rounded.

D19 (Fig. 6, D). 1 specimen, from Area A.

This relatively long point (6.3 cm.) has one straight and one slightly convex side. The shoulders, while well defined, are 2.3 cm. wide—only slightly wider than the stem, which expands slightly. The base is convex. Similar points have been reported from the Boat Dock Site (Bell, 1958a: Pl. 11, H-J).

D20 (Fig. 6, E). 1 specimen, from Area B.

The short, stubby blade has strongly convex edges, the basic blade shape being that of a short, broad leaf. No shoulders are indicated. Side notches create a stem area which is quite short and widely expanded so that the base (2.2 cm. in width) is wider than the maximum width of the blade. The base is concave. The length of the point is 2.7 cm. This form is reminiscent of the Ensor type as defined by Suhm, Krieger, and Jelks (1954: 422, Pl. 90).

D21 (Fig. 6, F). 1 specimen, from Area B.

The blade is triangular with straight edges. The shoulders are prominent and the parallel-sided stem terminates in a slightly convex base. The point is 4.7 cm. long, and 2.2 cm. wide.

D22 (Fig. 6, I). 1 specimen, from Area B.

This stemless, asymmetrical point has one strongly concave edge and one edge which is slightly convex. The length of the point is 4.7

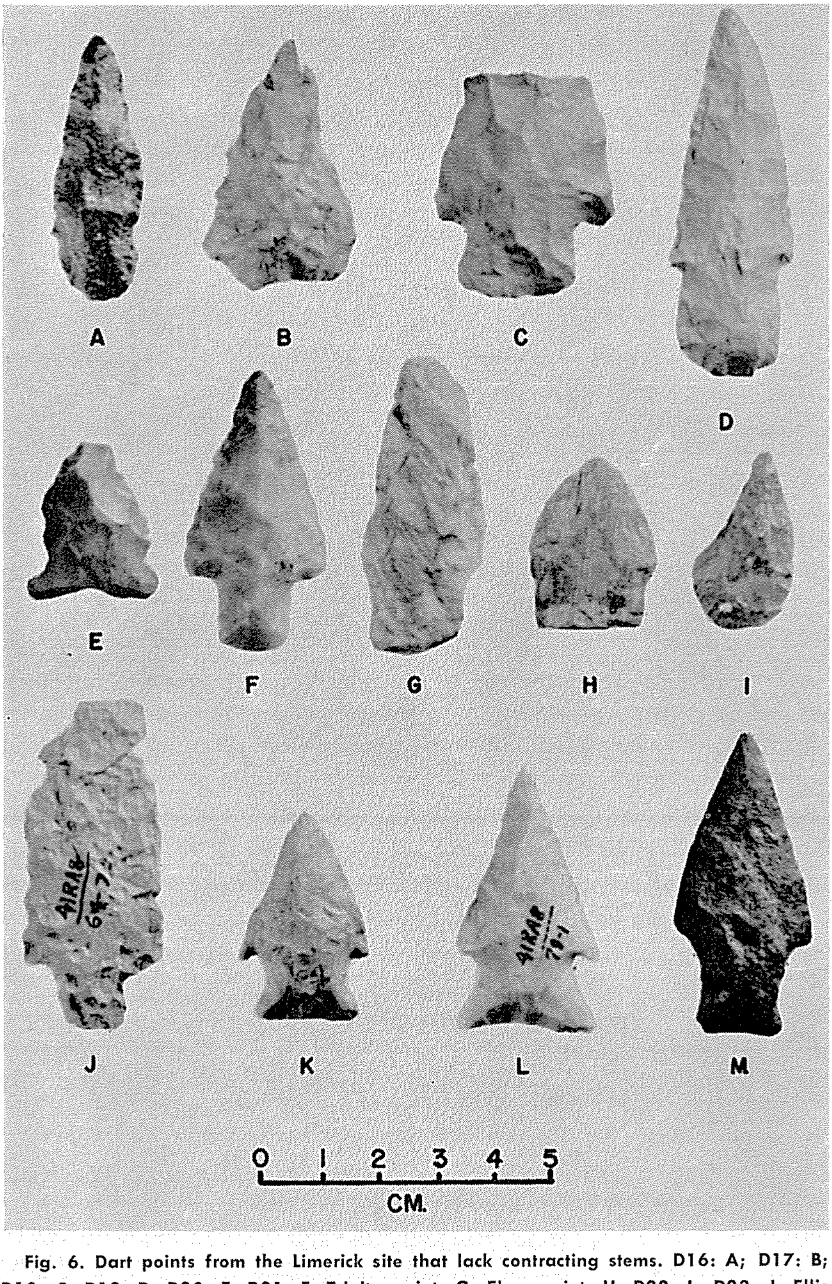

Fig. 6. Dart points from the Limerick site that lack contracting stems. D16: A; D17: B; D18: C; D19: D; D20: E; D21: F; Trinity point: G; Elam point: H; D22: I; D23: J; Ellis point: K; Edgewood point: L; Yarbrough point: M.

cm. and the width is 1.7 cm. The base is rounded. This specimen slightly resembles certain forms recovered from the Boat Dock Site (Bell, 1958a: Pl. 11, O, P).

D23 (Fig. 6, J). 1 specimen, from Area C.

The original shape of this point is difficult to determine since it is badly fire pitted and cracked. The portion of the point recovered suggests that it had a short, slightly expanding stem with a straight base. The blade was long with slightly convex edges.

Elam point (Fig. 6, H). 1 specimen, from Area C.

The short, stubby blade and the wide stem give this specimen a distinctive shape. The length is 2.8 cm. and the width 2.1 cm. The edges of the blade are convex and the shoulders are only slightly differentiated. The sides of the stem are parallel and the base is straight. This specimen is made of fossil wood and part of the outer patina of the original core is present. Similar points are illustrated and described as the Elam type—a diagnostic of the Elam Focus, Trinity Aspect—by Crook and Harris (1952: Pl. 4, No. 27).

Ellis point (Fig. 6, K). 1 specimen, from Area A.

The blade of this point, while basically triangular, has slightly convex edges. The shoulders, which are 2.2 cm. wide, are barbed and the expanding stem terminates in a straight base. The length of the point is 3.5 cm. Ellis is one of the more common dart point types found at the Davis Site, Alto Focus (Newell and Krieger, 1949: 166, Table 18), and has also been reported as a minor type in the Belton Reservoir on the Leon River (Miller and Jelks, 1952: 172).

Trinity points (Fig. 6, G). 6 specimens from Areas B and C.

Most specimens of this type are made of fossil wood. Each has side notches in the blade which set off the stem area. The notches vary in depth within the group. The stem is short and expands just above the base, which is commonly convex but in some instances is flat. The point of juncture between the base and the stem is rounded, forming "ears." The length of these points ranges from 2.8 to 4.9 cm. with the majority being approximately 3.8 cm. long. The width varies from 1.7 to 2.0 cm., and averages about 1.9 cm. The width of Trinity points as defined by Suhm, Krieger, and Jelks (1954: 484) varies from 2.0 to 2.5 cm. Since the modal width of the Trinity points from the Limerick Site is 1.9 cm., the Limerick sample indicates a slightly narrower form. In Area C they occurred principally in the lower levels. Points of this type are illustrated by Crook and Harris (1952: Pl. 1, Nos. 17, 18; also Pl. 4, Nos. 2, 3, 4).

Yarbrough point (Fig. 6, M). 1 specimen, from Area A.

This point seems to be an average example of the Yarbrough type. The overall length is 5 cm., the maximum width is 2.3 cm. and the stem length is 1.5 cm. The triangular blade has slightly convex edges. Concave side notches just above the base define the stem area which flares out to terminate in a faintly concave base. This point, although made of local reddish quartzite, has been finely chipped.

Edgewood point (Fig. 6, L). 1 specimen, from the surface of Area D.

This point has a length of 4.4 cm. and a width of 2.3 cm. The triangular blade has the right edge beveled on both faces. The shoulders are barbed and the stem expands so that the width across the base is equal to the width across the shoulders. The base is slightly concave.

Arrow Points

The arrow points from the Limerick Site were diversified and no one form dominated the arrow point category as the small Gary forms did the dart point category. Furthermore, only a few of the forms could be identified with previously established types. Some arrow points had some characteristics in common with established types but did not fit the type descriptions completely and consequently were not given type names.

The classification method employed on the Limerick Site artifacts tends to minimize the "lumping" effect that often results from the more direct typology approach. One arrow point type which has been affected by "lumping" in typological analysis is the Alba type. Some publications illustrate arrow points identified as Alba, but which differ considerably from the original type description in total length, in stem length, in base-stem form and in barb-shoulder form. Some variation in total length is to be expected, but according to the definition (Newell and Krieger, 1949: 161) the stem length is ¼ to ⅕ the total length of the point. In this context, the overall length is of considerable importance. In one case an arrow point with a stem 1/13 as long as the total length of the point was identified as an Alba point (Wheat, 1953: Pl. 35, a). Variation in the base-stem form is to be expected also, but some series of "Alba" points have parallel-sided stems, widely expanded stems, and bulb-shaped stems—all in one series. The parallel side and bulb-shaped stem forms conform to the definition of Alba as it was described (Newell and Krieger, 1949: 161) and as it was subsequently revised (Suhm, Krieger, and Jelks, 1954: 494; Bell, 1958b: 8). Never was the form described as having widely expanding stems. These forms termed "Alba" are probably a consistent group within the sites in which they were found, and certain arrow points in the group may conform to the definition of the Alba type. Generally, however, it is not known whether the arrow points which are of the standard Alba types are the dominant forms in the group or if they represent variants of the group and serve only to give it a name. These discrepancies and inconsistencies in the use of the term "Alba" indicate a need for further refinement of the term and/or a more discreet application of the term.

In the process of classification, the arrow points were divided into two groups—those with expanding stems and those with non-expanding stems. The following arrow point forms can be included in the expanding stem tradition.

A1 (Fig. 7, A). 5 specimens, from Areas A and B.

The distinguishing feature of this shape is a strongly expanding stem with a slightly convex base. The shoulders are well defined but not sharply barbed, and the triangular blade has slightly convex edges. These points average about 2 cm. long and 1.3 cm. wide, while the stem length is frequently .4 cm. Similar points from the Addicks Basin were identified as the Scallorn type* by Wheat (1953: Pl. 34, q, r), and others from the Hogge Bridge Site were classified as Alba by Stephenson (1952: Fig. 95, e, second from the right).

A2 (Fig. 7, B). 3 specimens, from Areas A, B, and C.

Expanding stems with slightly convex bases and barbed shoulders are the characteristic feature of this form. The blades are triangular and have slightly concave to slightly convex edges. Since the tips of all three specimens are broken, their length can not be determined, but the width is about 2.2 cm. and the stems are all about .6 cm. long. Similar forms at the Addicks Basin have been called Eddy Stemmed (Wheat, 1953: Pl. 34, w and x).

A3 (Fig. 7, C). 1 specimen, from Area A.

The single specimen of form A3 has a triangular blade with one well-defined shoulder, the other evidently having been broken off. The short narrow stem expands very slightly and the base is straight. The width of this point is about 1.7 cm. and the length is 2.5 cm. This form is possibly a variant of the Alba type.

A4 (Fig. 7, D-E). 8 specimens, from all areas.

This form has a triangular blade with concave edges and barbed

* Spelled "Scalhorn" by Wheat.

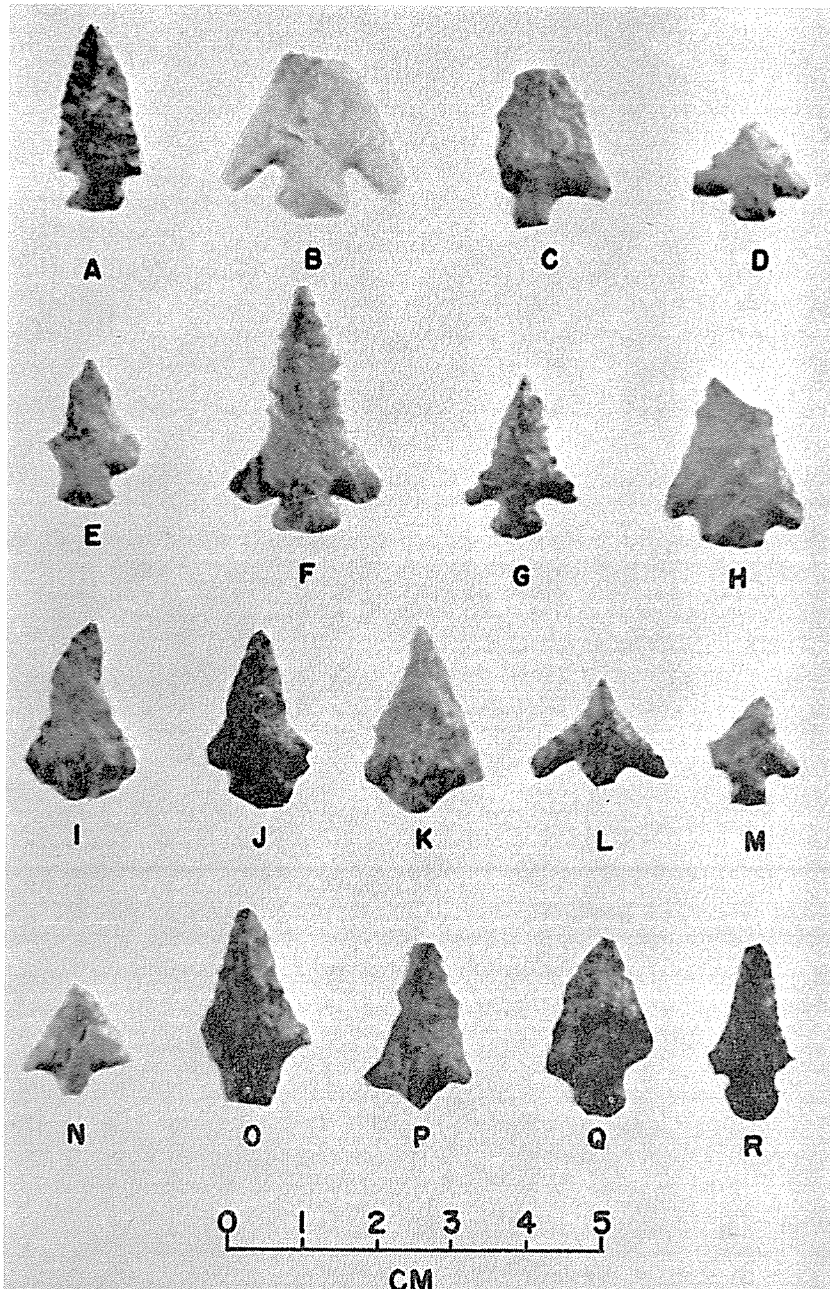

Fig. 7. Arrow point forms from the Limerick site. Form A1: A; A2: B; A3: C; A4: D-E; A5: F; A6: G; A7: H-K; A8: L-N; A9: O; A10: P; A11: Q; A12: R.

shoulders. The short expanding stem tends to have a straight base, although on some specimens the base is slightly convex. The average dimensions of this form are 2.0 cm. long and 1.6 cm. wide, with a stem that averages .4 cm. long.

A5 (Fig. 7, F). 2 specimens, from Area B.

These two specimens have serrated, recurved edges, and prominent shoulders. The stems are short and expanding and have slightly convex bases. The length of the one complete specimen is 3.4 cm., and the width is about 2 cm. The stem length is about .4 cm. Points with recurved edges that resemble this shape have been found in Wylie Focus sites (Stephenson, 1952: Fig. 95, g, third from right).

A6 (Fig. 7, G). 1 specimen, from Area B.

This point is 2.2 cm. long and has a triangular blade with serrated, concave edges. The shoulders are 1.5 cm. wide and are barbed. The stem expands and has a rounded base. This form, while reminiscent of the bulb-shaped stem or rounded stem variety of Alba, has a shorter stem.

A7 (Fig. 7, H-K). 11 specimens, from all areas.

The characteristic trait of this form is the very short, broad stem which in some cases is barely differentiated from the blade. The shoulders tend to be wide (average width 1.7 cm.) in relation to the overall length (average 2.1 cm.) of the point. The edges of the basically triangular blade are slightly concave to slightly convex. Generally these points are made from thin flakes with the chipping confined to the edges.

A8 (Fig. 7, L-N). 3 specimens, all from Area A.

These small points (1.5 to 2.0 cm. long) are characterized by unusually wide shoulders (1.4 to 1.8 cm.), so that the width of the blade is as great or nearly as great as the length of the point. The short stem, which is parallel sided to slightly tapering, terminates in a slightly convex base. Similar forms have been typed as Alba in the Wylie Focus (Stephenson, 1952; Fig. 95, e, first from left).

A9 (Fig. 7, O). 2 specimens, from Areas A and B.

The tapering stem of this form strongly resembles the stem shape of the Gary dart point. Both specimens have concave blade edges and prominent shoulders. The base of each has been broken off but the major part of the stem remains in each case. The dimensions of this form are approximately 2.8 cm. long by 1.6 cm. wide.

A10 (Fig. 7, P). 1 specimen, from Area C.

The triangular blade has slightly concave edges and is laterally barbed. The contracting stem is very short and the base is pointed. The length of this point is 2.3 cm. and the width is 1.6 cm. Points of this general shape have been described under the type name of Cliffton (Suhm, Krieger, and Jelks, 1954: Pl. 127, d, first from left) and also as Perdiz (Wheat, 1953: Pl. 34, k, l).

A11 (Fig. 7, Q). 3 specimens, from Areas A, B, and C.

The blades of these specimens have convex edges and the shoulders, which protrude at right angles to the blade, are prominent. One shoulder on each of the specimens is lower than the other, and the short, rounded stem has a convex base. The average size of this point form is 2.4 cm. long and 1.7 cm. wide, with a stem length of .5 cm.

A12 (Fig. 7, R). 1 specimen, from Area A.

This point, which is 2.3 cm. long and 1.1 cm. wide, has a blade with concave edges. The shoulders, which are well defined, appear to have had sharp barbs that have been broken off. The stem is bulb-shaped and has a well rounded base. Possibly this form could be included in the Alba type.

A13 (Fig. 8, A). 1 specimen, from Area C.

The triangular blade with serrated edges has barbed shoulders, the base is rounded, and the stem is short. This specimen is 2.7 cm. long. Points similar to this have been reported from Addicks Basin and typed as Alba by Wheat (1953: Pl. 35, c, d).

A14 (Fig. 8, B). 1 specimen, from Area C.

The stem on this point is short and has a rounded base. The shoulders are barbed and are 1.6 cm. wide. The portion of the blade which remains suggests that the edges were serrated.

A15 (Fig. 8, C). 1 specimen, from Area B.

This stemless specimen is 1.8 cm. long and is roughly leaf-shaped with a flat base. The point is 1.5 cm. wide. It resembles somewhat the Young type (Suhm, Krieger, and Jelks, 1954: Pl. 134); however, it differs from that type in that it falls below the defined dimensions for Young.

A16 (Fig. 8, D). 2 specimens, from Areas A and C.

This form is a stemless triangular point which is 2.4 cm. long and 1.6 cm. wide. It has a concave base.

A17 (Fig. 8, E-F). 3 specimens, all from Area B.

These stemless points have triangular blades with slightly concave

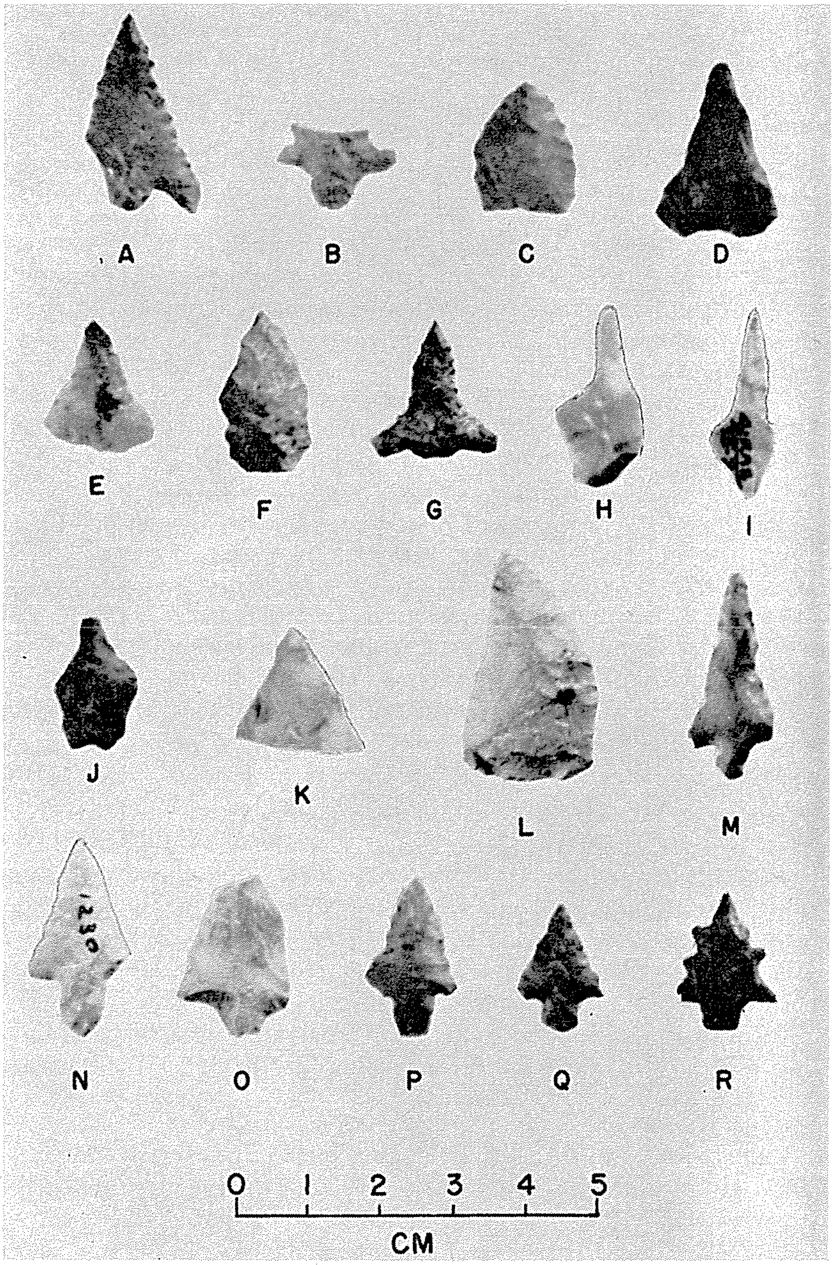

Fig. 8. Arrowpoints (A-G, L-R) and drills (H-K) from the Limerick site. Arrowpoint form A13: A; A14: B: A15: C: A16: D; A17: E-F; A18: G; Drill I forms: H-I; Drill II form: J; Drill III form: K; arrow point form A19: L; Perdiz point: M; Bonham point: N; Cliffton point: O; Alba points: P-R.

edges or, in one case, convex edges. The bases are slightly convex. The average dimensions are 2.0 cm. long by 1.3 cm. wide. This form is similar to some found in Wylie Focus sites (Stephenson, 1952: Fig. 95, c, second from right).

A18 (Fig. 8, G). 1 specimen, from Area C.

Although the stem is missing this point is included in the analysis because of its distinctive blade form which has serrated, recurved edges and prominent shoulders. The width of this specimen is 1.8 cm., and the length is 2.0 cm. This blade, while similar in outline to arrow point form A5, varies from it in size.

A19 (Fig. 8, L). 1 specimen, from the surface of Area A.

This stemless point which is 3.1 cm. long and 1.8 cm. wide has a triangular blade with one concave and one convex edge. The base is slightly convex. This specimen may be an aberrant form of the Fresno type (Suhm, Krieger, and Jelks, 1954: 498, Pl. 128).

Alba points (Fig. 8, P-R). 7 specimens, from Areas B, C, and D.

The stems of these specimens have an average length of .44 cm. and have parallel sides with straight bases. The shoulders, with an average width of 1.3 cm., are prominent and frequently barbed. The blade lengths vary within the group and are basically triangular in shape with slightly concave edges. Most of the specimens have serrated blade edges. The average length of the points is 2 cm. These points as a group are consistently smaller than the average form of the Alba type (Suhm, Krieger, and Jelks, 1954: 494) and, in addition, have serrated blade edges. Points of this form have been found in Wylie Focus sites (Stephenson, 1952: Fig. 95, E, second and seventh from the left); at Addicks Basin (Wheat, 1953: Pl. 35, e, g); at the Davis Site, Cherokee County (Newell and Krieger, 1949: Fig. 56, d and h); in sites at Belton Reservoir (Miller and Jelks, 1952: Pl. 25, No. 2, second and third from right); and at the Blum Rockshelter, (Jelks, 1953: Pl. 19, g, h).

Bonham points (Fig. 8, N). 4 specimens, from Area B.

This form, with an average length of 2.55 cm., has a triangular blade with straight to slightly concave edges. The shoulders are barbed (average width 1.36 cm.) and the stems relatively elongated (average length .7 cm.). There is a slightly expanded area in the stem about halfway between the base and the blade. The base is rounded or slightly pointed. Points of this type were found at the Sanders Site in Lamar County (Krieger, 1946: 185, Pl. 22, e).

Cliffton points (Fig. 8, O). 2 specimens, both from Area B.

These two points are only slightly more than modified flakes. One specimen exhibits flaking on only one face; the other is flaked on both faces. The points are crude in appearance, but basically they have a short, tapering stem with a rounded base and a triangular-shaped blade. Both specimens are about 2.2 cm. long and 1.6 cm. wide. Points similar to these were found at the Harrell Site in Young County (Krieger, 1946: Fig. 7, r, s) and at the Belton Reservoir on the Leon River (Miller and Jelks, 1952: Pl. 24, No. 3, first on left).

Perdiz points (Fig. 8, M). 3 specimens, from Area A and B.

The narrow, pointed stem of this form is a characteristic trait. The blade has a relatively elongated, triangular shape with prominent shoulders. The length of the one complete specimen is 2.8 cm. and the average width is 1.4 cm. The average stem length is .5 cm., which is in the lower limits defined for the Perdiz type (Suhm, Krieger and Jelks, 1954: 504). The Limerick specimens have some characteristics of both the Perdiz and Bonham types; however, they seem to be closer to Perdiz. Similar points were found at the Boat Dock Site (Bell, 1958a: Pl. 12, U) and in the Addicks Basin (Wheat, 1953: Pl. 34, e, g, i).

Miscellaneous Chipped Stone Artifacts

Knives

The term knife as used herein refers to an implement which appears to have been used for cutting purposes, the blade of which is worked on both faces. A knife form shows some tendency toward a definite, elongated shape. Several knife varieties were found at the Limerick Site. These forms are designated with Roman numerals to facilitate reference.

Knife I (Fig. 9, C-D). 4 specimens, from Areas A and B.

These specimens, which vary from 4.7 to 6.9 cm. long, have convex bases and triangular blades with slightly convex edges.

Knife II (Fig. 9, A). 6 specimens, from Areas A and B.

These knives are triangular and quite similar in shape to Knife I. However, smaller flake scars and better workmanship are apparent in the manufacture of this form. In addition, they are smaller and range in length from 3.8 to 5.2 cm. These could be classified as projectile points.

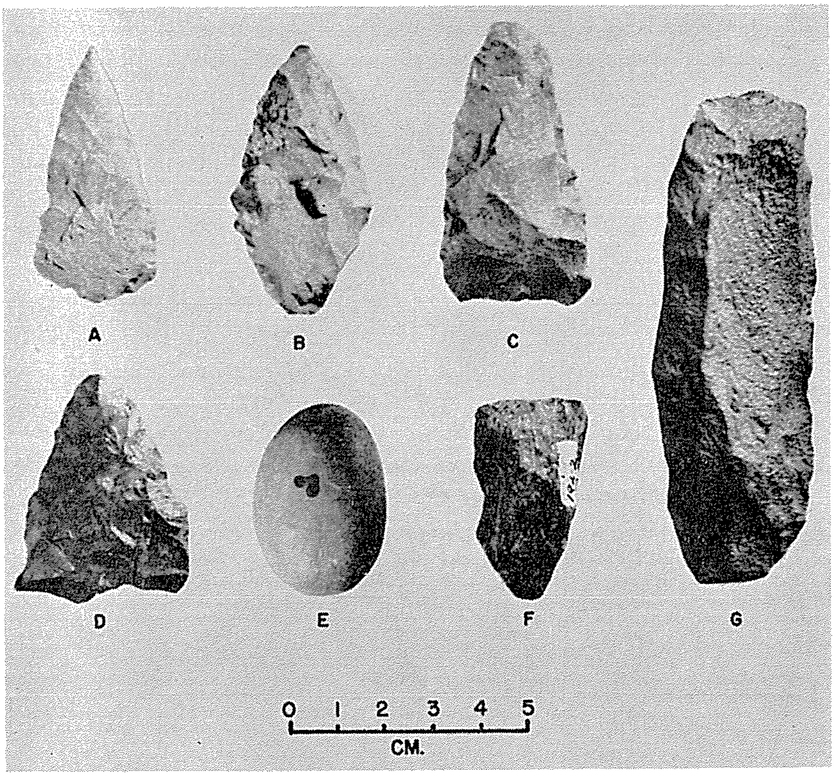

Fig. 9. Knives, gouges, and a pecking pebble from the Limerick site. Knife I forms: C-D; Knife II form: A; Knife III form: B; Gouge I form: F; Gouge II form: G; pecking pebble: E.

Knife III (Fig. 9, B). 1 specimen, from Area B.

This specimen is a thick implement with a tapering stem and a rounded, almost pointed base. It resembles a heavy, crude, Gary type dart point. It is 5.7 cm. long.

Knife IV (Fig. 10, K). 5 specimens, from Area C.

This knife form has a rounded base and an elongated blade with convex edges which taper to a rounded point. It is thin and lenticular in cross section and small flakes were removed in its manufacture. The complete specimens of this knife form range in length from 3.1 to 4.1 cm., but the broken ones suggest that some may be slightly longer.

Corner-tang Knife (Fig. 10, L). 1 specimen, from Area B.

This corner-tang knife is basically a triangular form with one corner worked to form a stem or a "tang." It was fashioned from a thin flake by delicate flaking around the edges, the major portion of both faces being unflaked. The knife is 5 cm. long. The stone is a pale brown chert which appears to be foreign to the Iron Bridge area.

Scrapers

In this classification the term "scraper" refers to those implements which are basically plano-convex and are chipped on one or both faces. Thus the term is strictly denotative and does not necessarily bear any functional connotation. Using this definition as a basis, the scrapers from the Limerick Site may be separated into several form groups.

Scraper I (Fig. 10, A-B). 7 specimens, from Areas A, B, and C.

This form is characterized by its oval to circular shape, with flakes removed all around the edges from one face. Scrapers of this form have been found in the Wylie Focus (Stephenson, 1952: Fig. 96, a, Nos. 12–15) and in Addicks Basin (Wheat, 1953: Pl. 42, d, e).

Scraper II (Fig. 10, C). 1 specimen, from Area B.

This form of scraper is made from a thick flake, one edge of which has been worked. In longitudinal cross section the top and bottom are flat and the top curves down to form the working edge of the implement. The flakes removed from the working edge are smaller than the other flakes used in shaping the tool. Similar scrapers have been illustrated for the Trinity Aspect (Crook and Harris, 1952: Pl. 2, Nos. 3–5).

Scraper III (Fig. 10, D, F). 29 specimens, from Areas A, B, and C.

These specimens are made from irregular-shaped flakes. Generally only one edge of the flake was worked but occasionally more than one edge shows evidence of working.

Scraper IV (Fig. 10, E, G). 2 specimens, from Area B.

This small scraper form is roughly oval in shape and is made from a thin flake. One face of the scraper is the unmodified flake scar. All edges have been worked.

Scraper V (Fig. 10, H-J). 8 specimens, from Areas C and D.

These scrapers, while basically triangular in shape, have strongly convex edges and base. The blade has one relatively flat face and the other often exhibits some of the core patina.

Bifacial Implements

The characteristic feature of the biface is that it has been worked on both faces and any edge of the tool could have been used for cutting

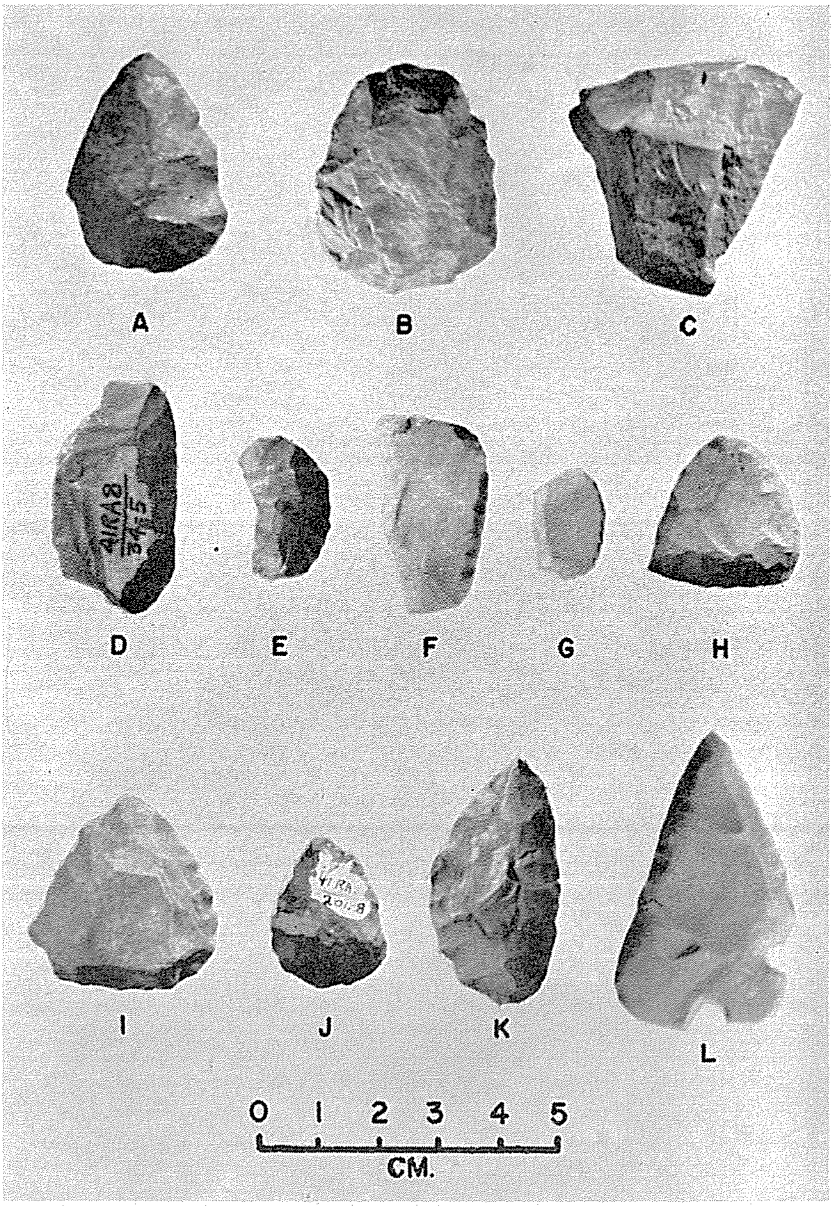

Fig. 10. Scrapers and knives from the Limerick site. Scraper I forms: A-B; Scraper II form: C; Scraper III forms: D, F; Scraper IV forms: E, G; Scraper V forms: H-J; Knife IV form: K; corner-tang knife: L.

and/or scraping. They generally are lenticular in longitudinal and lateral cross section and they tend to be thicker than most of the other artifacts which are bifacially chipped. The form varies sufficiently so that three categories may be used in describing them.

Biface I (Fig. 11, A-B). 47 specimens, from Areas B, C, and D with a heavy concentration in Area C.

These relatively small artifacts vary from roughly circular to oval in outline. In longitudinal and lateral cross section they generally have a thin lenticular shape. Basically the flaking is of the crude percussion type, but many have small flake scars resulting from pressure chipping. Some of these specimens closely resemble implements categorized as Scraper V, the difference between Biface I and Scraper V being the scraper has one face unmodified. Some of the biface specimens, although both faces have been worked, have one relatively flat face. Similar artifacts have been found in the Wylie Focus (Stephenson, 1953: Fig. 96, Nos. 2, 4, 6, 7) and in the Trinity Aspect (Crook and Harris, 1952: Pl. 2, Nos. 12, 13, 15; also Pl. 5, Nos. 4–9).

Biface II (Fig. 11, C-H). 15 specimens, from Areas A and C.

This form is represented by miscellaneous cores which have been chipped on both faces. They tend to be elongated and worked on all edges.

Biface III (Fig. 11, I). 3 specimens, all from Area A.

These specimens, larger than the other bifaces, were manufactured by the removal of flakes from all edges of a pebble. On some areas of the specimen patches of the original patina remain. The flake scars are large and irregular, suggesting that the flakes were removed by a percussion method. Two of the implements are roughly circular in shape, but the third has a rounded base and edges which taper to form a rounded point.

Drills

An artifact was classified as a drill when one portion was either noticeably longer and narrower than the rest of the implement and/or had indications of wear which could have resulted from use as a drill. No ensiform, T-shaped, or reworked projectile point drills were found. Three different forms of drills were recognized.

Drill I (Fig. 8, H-I). 2 specimens, both from Area A.

This form consists of a narrow, needle-shaped blade with a base

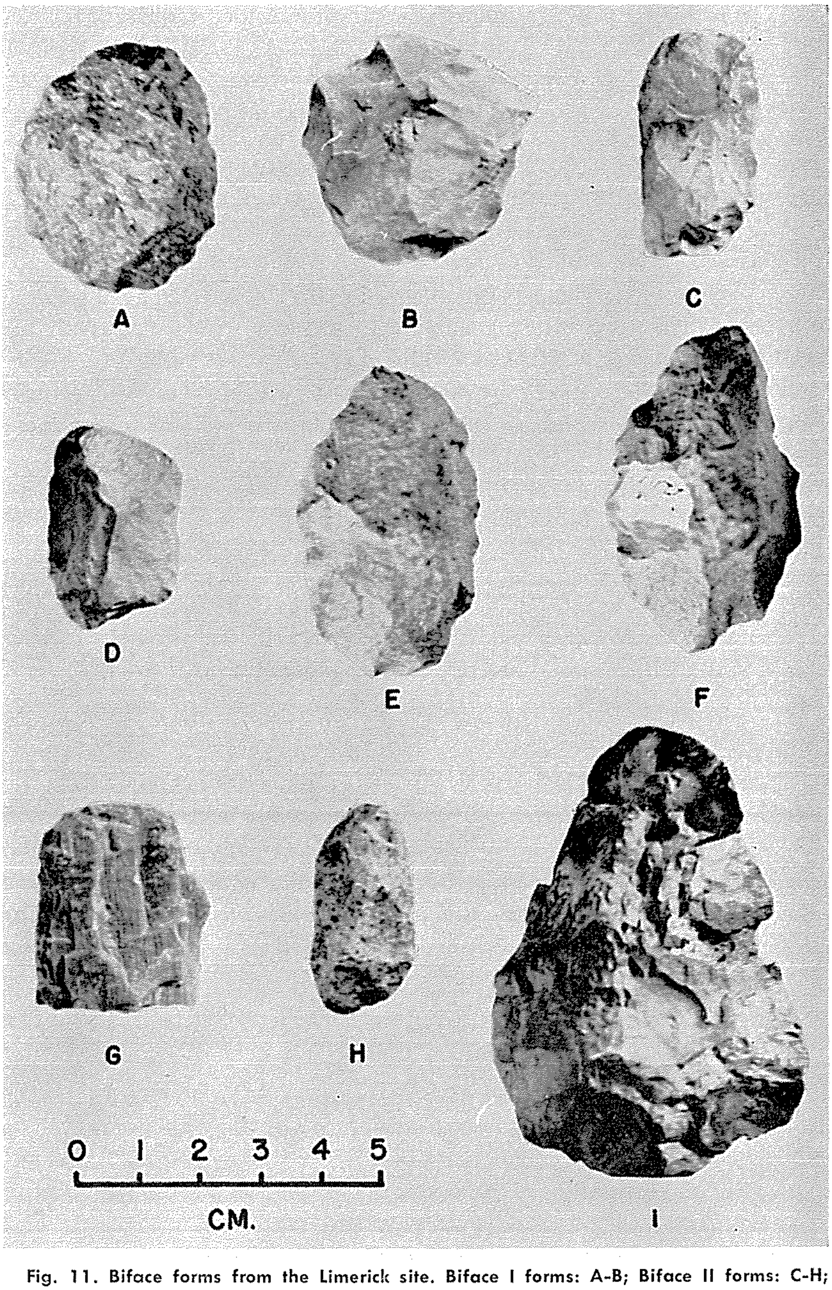

Fig. 11. Biface forms from the Limerick site. Biface I forms: A-B; Biface II forms: C-H; Biface III form: I.

which is an unmodified portion of a flake. Drills of this form were found in Addicks Basin (Wheat, 1953: Pl. 44, c).

Drill II (Fig. 8, J). 4 specimens, from Areas B and C.

This drill shape has a narrow blade and—in contrast to Drill I—a rounded base which has been chipped to shape. This form has been found at the Boat Dock Site (Bell, 1958a: Pl. 12, k) and in Wylie Focus sites (Stephenson, 1952: Fig. 95, h, first and third from left, second and third from right).

Drill III (Fig. 8, K). 1 specimen, from Area B.

While this form does not show evidence of having been made intentionally for use as a drill, it does appear to have been used for that purpose. Just above the point of the blade are two slight indentations where very small flakes have been removed or knocked off in use. Similar drills have been found in Addicks Basin (Wheat, 1953: Pl. 44, e, f) and at the Boat Dock Site (Bell, 1958a: Pl. 12, n).

Gouges

Gouges are probably specialized forms of scrapers. Those recovered from the Limerick Site are oblong or roughly triangular with a cutting edge at the broader end. The blade at the broad end has one relatively steep side sloping to the leading or cutting edge of the tool. Generally one face of the implement tends to be flatter than the other. The four gouges found at the Limerick Site can be divided into two groups.

Gouge I (Fig. 9, F). 3 specimens, from Areas A, C, and D.

This form is small and made of quartzite or petrified wood. The working edge is either concave or straight and the sides taper to a pointed end. These forms have been reported from Wylie Focus sites (Stephenson, 1952: Fig. 96, A, 17), the Boat Dock Site (Bell, 1958a: Pl. 12, c, d), and Trinity Aspect sites (Crook and Harris, 1952: Pl. 2, Nos. 7, 10).

Gouge II (Fig. 9, G). 1 specimen, from Area A.

The gouge II form is an elongated implement made of ferruginous sandstone with the convex working edge at one end. The edges of the blade are relatively smooth. The shape and materials suggest that this specimen was made from a sandstone concretion. Ferruginous sandstone gouges have been found at the Yarbrough Site (LeRoy Johnson, Jr., personal communication) and also have been reported from Archaic sites on the upper Trinity River (E. B. Jelks, personal communication). This form has been included as a trait of the tentative East Texas Aspect (Suhm, Krieger, and Jelks, 1954: 150).

Pecked or Ground Stone Artifacts

Pecking Pebbles

Three specimens, from Areas B, C, and D, (Fig. 9, E). These are stream pebbles which were utilized without preliminary modification. Use marks are present on one or more sides of the stone.

Hammerstones

Four specimens, from Areas A and B. Hammerstones are larger than pecking pebbles and are cobbles which have been utilized without previous modification. Usage is indicated by marks or battered areas on various portions of the stone.

Hand Stone

Two specimens, both from Area B. These fragments indicate that two forms of the hand stone were known to the people at the Limerick Site. One fragment has a squared end and the other specimen has a rounded end. Both specimens have small fire cracks on the surface.

Grinding Slab

One specimen, from Area C. This quartzite conglomerate fragment has one smooth side and possibly is part of a grinding slab.

Pitted Stone

One specimen, from Area B, (Fig. 12). This piece of laminated sandstone is pitted on both sides. The pits appear to have been pecked into the surface of the stone. They are located directly opposite each other and, had they been slightly deeper, would have penetrated the stone.

Pottery

A total of 1095 sherds, including the 516 found on the initial survey, was recovered at the Limerick Site. The sherds found on the preliminary survey of the site are not included in the present analysis since the area in which they were found is not known. They are, however, essentially the same as those recovered from the excavations; there-

Fig. 12. Pitted stone from the Limerick site.

fore they are useful in complementing the analysis of the excavated material.

While 155 decorated sherds were found, only 57 of them have a known provenience. The decorative techniques consist of incising, engraving, red filming, trailing, punctating and appliqueing. Some of the sherds found on the surface have trailing or broad line incising. Most of the incised and engraved wares were identified as Sanders Focus types Canton Incised and Sanders Engraved (Fig. 13). Some engraved sherds, because of their small size, could not be included in these categories with certainty; however, they probably are of these same types.

Sanders Plain (Fig. 13, D). 520 sherds.

The plain wares recovered are characteristic of type Sanders Plain (Suhm, Krieger, and Jelks, 1954: 350). They have clay-grit tempering, but some sherds are partially or completely tempered with bone. Wall thickness ranges from .2 to 1.3 cm.; however, the majority of the sherds average from .6 to .7 cm. The color varies from buff to brown or gray, sometimes with a mixture of the latter two. The lips are rounded and some are slightly flattened. One rim sherd has shallow notches incised at right angles to the lip. This same sherd also has a distinctive profile in that it is thickened on the interior of the vessel by the application of a thin strip of clay. At the lip area this strip merges with the exterior of the vessel, but the lower face of the clay strip protrudes on the interior and a small groove under the edge of the strip is present where it is imperfectly joined with the interior wall. The resulting rim profile is hook-shaped. Other decoration on the sherds includes red slipping. Although no complete vessels are present, the sherds indicate that carinated bowls, bottles, and forms with slightly out-turned rims (barrel shape?) are present. Some sherds indicate tall cylindrical forms which may be "goblets," or possibly the cylindrical vessel forms characteristic of type Canton Incised. Plain sherds from decorated types could be included easily in this plain ware category since the pottery characteristics (tempering, surface finish, etc.) for all the types found at the site are the same, except for the decorating techniques.

Canton Incised (Fig. 13, A, C, E-G). 37 sherds.

The sherds grouped as Canton Incised have clay-grit temper with some mixture of crushed bone. The lip of this form tends to be flat but in some cases is rounded. The wall thickness ranges from .4 to .8 cm. The color is predominantly brown with some gray-brown. The ex-

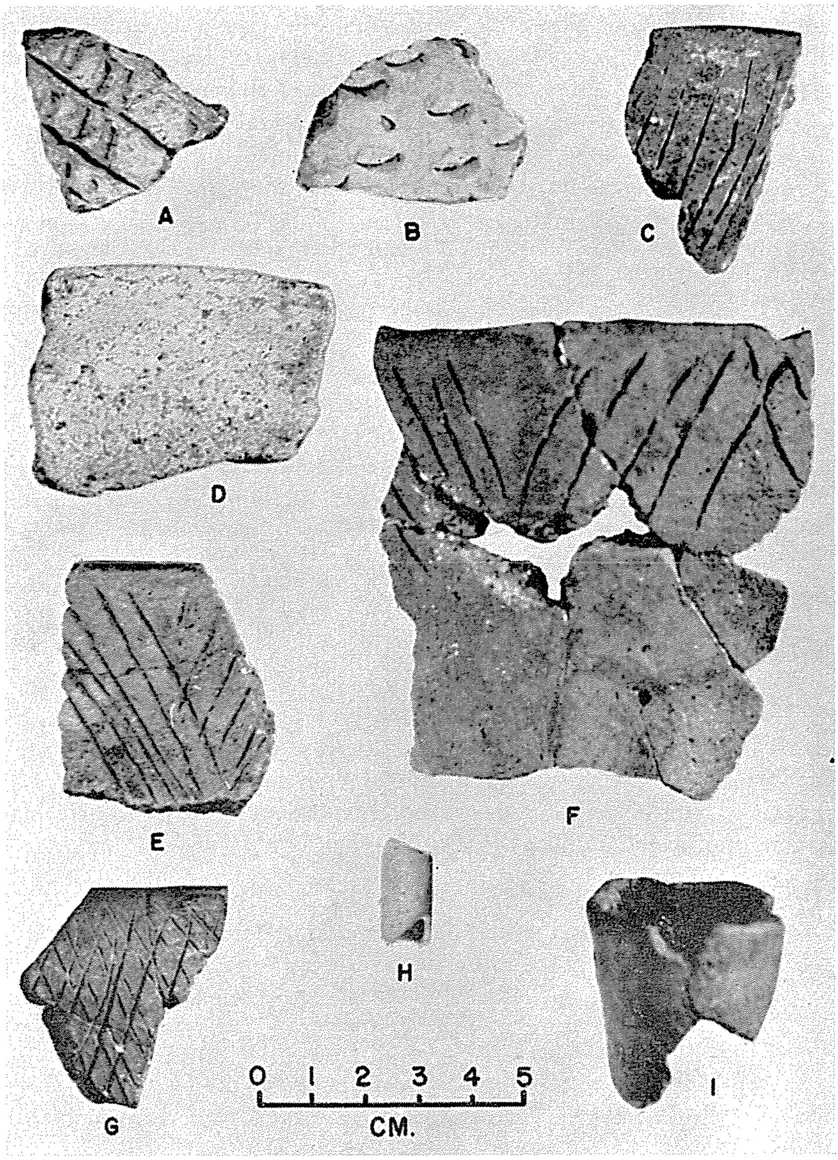

Fig. 13. Pottery from the Limerick site. Canton Incised: A(?), C, E-G; finger-nail punctated: B; sanders Plain rim: D; Sanders type pipe fragments: H (stem), I (bowl).

terior appears to be smoothed better than the interior, although neither surface is polished. The designs show parallel diagonal lines incised around the rim. These are incised in the same direction; in alternating directions; or crossed to form diamond-shaped elements. Some sherds found on the surface have punctations in conjunction with the incising. The only form indicated by the sherds is a cylindrical vessel. These pottery characteristics are included in the type Canton Incised (Suhm, Krieger, and Jelks, 1954: 254).

Sanders Engraved. 8 sherds.

The sherds classified as Sanders Engraved are in the minority and, as in the Canton Incised, only one vessel form is indicated—the carinated bowl. The majority of the Sanders Engraved lips are flat, but some are rounded. The tempering is the same as that present in the other pottery types at the site—clay-grit with a small amount of bone mixture. The designs are engraved parallel diagonal lines oriented in the same direction; excised triangular areas; and parallel diagonal lines oriented in opposite directions. Except for the presence of only one vessel form and the excised decoration, these sherds are characteristic of the type Sanders Engraved.

Punctated Sherds. 11 sherds.

The punctated sherds are of two types—stick punctates and fingernail punctates. These sherds have the same tempering characteristics as the other sherds from the site. No sherds were found which were indicative of vessel forms, and the rim sherds show that the lips are flattened. The punctations are randomly impressed over the surface of the sherds; no designs are present.

Applique Sherd. 1 sherd.

One sherd was found which had applique in conjunction with stick punctating. The temper, similar to the other sherds at the site, is clay-grit and bone. The surface is smoothed but not polished.

Pipe (Fig. 13, H-I). 2 fragments.

A pipe with a conical clay bowl similar to the elbow pottery pipes found at the Sanders Site was recovered in Area B of the Limerick Site. Clay pipe stem fragments were found in Area A and on the surface of the site. The sherds of the pipe are clay-grit tempered and the undecorated surface is poorly smoothed. The interior of the bowl is blackened and, in small areas, patches of carbonized material adhere to the inside of the bowl.

Area A

The knoll, designated as Area A, consists of a low, circular, clay hill capped by a thin mantle of sandy soil. It is approximately 325 feet in diameter and its highest point stands eight feet above the surrounding floodplain (Fig. 14). Although the flanks of the knoll had much

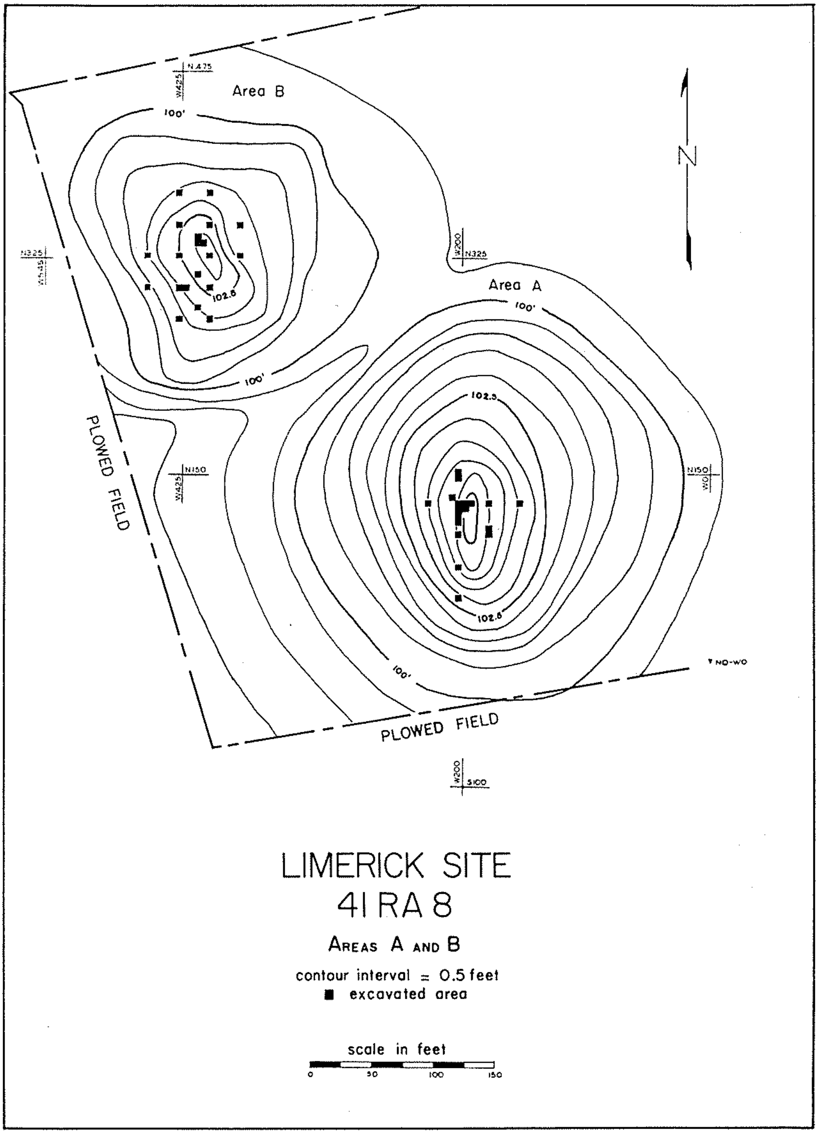

Fig. 14. Contour map of a portion of the Limerick site, showing Areas A and B.

cultural debris on the surface, the depth of the soil on the flanks was very shallow, being six inches or less to the underlying sterile clay. On top of the knoll the sandy soil was deeper and, consequently, most of the test pits were confined to the summit of the knoll.

The clay hill (Fig. 15) is probably a remnant of the sandy clay bedrock left isolated on the Sabine floodplain as a result of erosion. The origin of the sand on top of this clay knoll is uncertain. Cultural debris was found throughout the sand and on top of the clay suggesting that the sand was deposited on the knoll during the period of human occupation. However, the surrounding floodplain is composed principally of black, stream-deposited gumbo soil, which suggests that the sand on the knoll is not the result of alluvial deposition. It is possible that the sand derived by leaching or weathering processes out of the sandy clay bedrock. But in that case it is difficult to explain the presence of artifacts throughout the sandy zone. There is no evidence to suggest that the sand was carried in by man.

A total of 18 test pits, with depths varying from 6 inches to two feet below the surface, was excavated in Area A. Each pit was 5 feet square. In the majority of the squares two or three six-inch levels were excavated. The top 5 or 6 inches represented a disturbed plow zone consisting of light gray, sandy soil. Below this, the sandy soil was darker gray with flecks of charcoal and other occupational detritus. This zone varied in thickness from 0 to 18 inches but for the most part was 6 to 8 inches thick. Below this stratum lay a transitional zone where the dark gray, sandy humus soil of the overlying zone was mixed with the yellow sandy clay of the underlying bedrock formation. This was a more compact zone than those above it, and it varied from 0 to 8 inches in thickness. Beneath the transitional zone the yellow clay bedrock formation was encountered. This clay, which contained small orange-colored stains, was sandy but very compact. Cultural material was encountered in all the zones except the bedrock formation.

The cultural litter on the surface of Area A indicated that it might have a greater artifact yield than the other areas of the site; however, the excavations produced few artifacts and no occupational features.

Dart Points

The majority (79%) of the dart point forms recovered from Area A are of the Gary contracting stem tradition. In addition, one Ellis and one Yarbrough point were recovered in the excavations. The dart points are concentrated in levels 2 and 3, where 69% of them are found.

Arrow Points

Of the 24 arrow points found in Area A, only one could be identified as a previously defined type. This was a Perdiz point found in level 1. The arrow point forms at Area A are quite similar, by and large, to those found at the other three areas. In general, it can be stated that the arrow points, in contrast to the dart points, were concentrated in the upper two levels (Fig. 17, A) with 75% occurring in level 1 and 21% in level 2.

TABLE 1

Vertical Distribution of Dart Point Forms in Area A

Forms	*Level 1* (0–6″)	*Level 2* (6–12″)	*Level 3* (12–18″)
Gary D1	3	6	1
Gary D2	....	3	1
Gary D4	1	1	1
Gary D5	1	1	....
Gary D9	1	2	....
Gary D10	1	....	....
D16	1	....	....
D17	....	1	....
D18	....	1	....
D19	....	1	....
Ellis	....	1	....
Yarbrough	1	....	....
Total	9	17	3
Percentages	31%	59%	10%

Sherds

Area A yielded more sherds than any other class of artifacts. When analyzed according to temper, three main groups are indicated—clay (sherd?) and clay-grit, bone and clay, and bone tempering. A few sherds could not be grouped with certainty into any of these categories. A horizontal distribution analysis of the various groups of tempering revealed no particular area of concentration for any one group.

Of the 158 sherds recovered, only 9 are rim sherds and 3 are base sherds. Generally the sherds are small and vessel shapes difficult to determine. Twenty-two sherds show evidence of decoration including

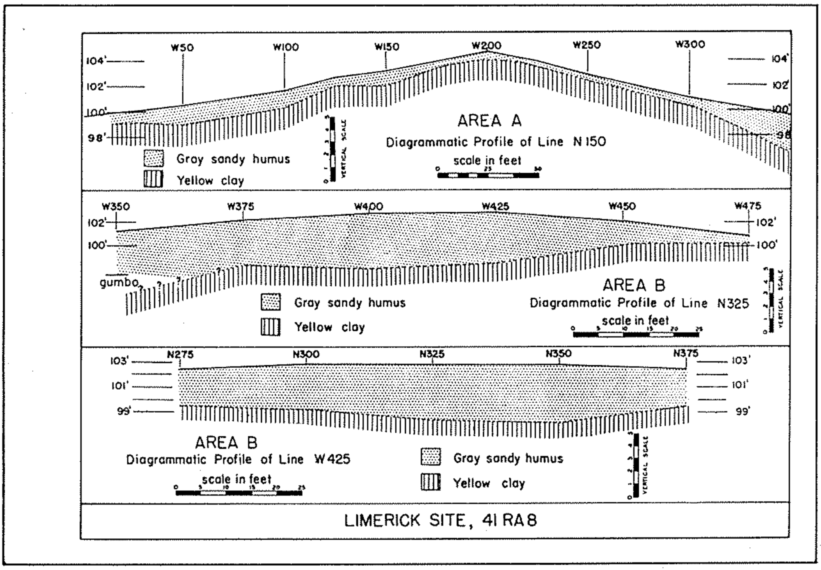

Fig. 15. Diagrammatic profiles at the Limerick site, Areas A and B.

TABLE 2

Vertical Distribution of Arrow Point Forms in Area A

Forms	*Level 1*	*Level 2*	*Level 3*
Expanding stem			
A1	1	1	....
A2	....	....	1
A3	1	....	....
A4	1	....	....
Non-expanding stem			
A7	2	1	....
A8	1	2	....
A9	1	....	....
A11	....	1	....
A12	1	....	....
A16	1	....	....
Perdiz	1	....	....
Fragments	8	....	....
Total	18	5	1
Percentages	75%	21%	4%

engraving, red filming (both inside and outside), punctating (in conjunction with appliqueing and incising), and incising. The small number and the small size of many of the decorated sherds hinders extensive comment on the designs present. However, more sherds of incised ware with designs which appear to be typical of the type Canton Incised were found than any other decorated type. Recognized types include Sanders Plain, Sanders Engraved, and Canton Incised. In addition to the vessel sherds, a pottery pipe stem fragment was found.

Vertical analysis of the sherd distribution revealed that they were concentrated in the upper levels of Area A with 86.7% being in the first level and 12.7% in the second.

Miscellaneous Artifacts

The miscellaneous artifacts—drills, knives, scrapers, bifaces, etc.—had a relatively general vertical distribution, with no indication of significant clustering in either the upper or the lower levels.

TABLE 3

Vertical Distribution of Sherds at Area A

	Level 1	*Level 2*	*Level 3*	*Surface*
Clay and grit tempered	68	8	....	80
Bone and clay tempered	60	7	....	28
Bone tempered	7	4	1	....
Unknown	2	1	....	....
Totals	137	20	1	108
Percentages	86.7%	12.7%	.6%	....

TABLE 4

Vertical Distribution of Miscellaneous Artifacts from Area A

	Level 1	*Level 2*	*Level 3*	*Surface*
Biface III	1	1	1	2
Gouge I	....	1	....	....
Gouge II	....	....	1	....
Hammerstones	1	1	....	1
Knife I	....	2	1	....
Knife II	....	2	....	....
Scraper I	1	2	1	6
Scraper III	4	3	4	2
Scraper V	....	....	....	3
Biface II	2	1	3	2
Drill I	1	1	....	....
Miscellaneous chipped objects	12	7	2	....
Total	22	21	13	16
Percentages	39%	38%	23%	....

Paint Pigments

During excavation many small fragments of limonite and hematite were found. Initially these were thought to have been imported into the area but, as excavation continued, the number and irregular shape of the fragments suggested that they occurred naturally in the area. No evidence of their having been used as pigments was recovered in Area A.

Negative Features

No artifacts of bone, antler, shell, and polished stone were found in Area A, nor were there any features such as burials, pits, post molds, hearths, and other indications of sedentary occupation. The only evidence of a structure was the presence of a few fragments of clay daub and a baked mud-dauber's nest.

Subsistence

A lack of evidence for agricultural activities of the people who occupied Area A of the Limerick Site implies a hunting and gathering mode of existence. There is, however, a general scarcity of animal bone, possibly due to poor conditions of preservation. Of the bones recovered, deer bones were the most abundant, suggesting that the deer was the chief source of animal food.* In addition to deer bones, a few raccoon teeth were found, as well as a beaver mandible fragment. The evidence for gathering is even more scarce. No mussel shells were encountered in this area and only one charred nut (?) was found.

Discussion

Since there was no well-defined stratigraphic separation of materials at Area A, a percentage analysis by artificial levels of each major artifact class was undertaken in order to determine any general trends in vertical distribution that might be present (Fig. 17, A, B, C, D). Graphing these percentages, a summary picture is obtained which indicates a diminishing incidence of dart points and an increasing incidence of arrow points and of pottery from the lower to the upper levels (Fig. 18).

* Identification of the animal bones was generously made by Dr. John A. Wilson, Professor of Geology, The University of Texas.

In the upper level, the materials are representative of the Neo-American stage when pottery of types Sanders Plain, Sanders Engraved, and Canton Incised—as well as long-stemmed clay pipes typical of the Sanders Focus—were in use. Other traits characteristic of the Sanders Focus are absent. As the Sanders Focus has been defined primarily on the basis of burials, this difference may be partially reconciled, since the Limerick Site was probably only a temporary hunting camp used intermittently by a group with Sanders Focus cultural affiliations.

In the lower levels, the large number of dart points as opposed to arrow points and pottery sherds, indicates an occupation by a group with Archaic affiliations. The small sample of materials from these levels prohibits a precise classification.

The few sherds and arrow points in the lower levels of Area A could possibly be attributed to natural disturbances and/or to the artificial levels used in the excavations. However, criteria on which these materials could be shown to be intrusive in the lower levels are lacking.

Area B

Area B is an irregularly-shaped knoll, approximately 225 ft. in diameter, situated about 300 ft. northwest of Area A. Between the two knolls is a low connecting saddle. Topographically Area B has the same characteristics as Area A, but its point of maximum elevation is only six feet above the floodplain level as compared to a maximum elevation of eight feet for Area A (Fig. 14). Structurally, however, Area B differs from Area A (Fig. 15). It is a low sand hill which appears to rest in a shallow basin in the sandy clay subsoil. From all indications the knoll is a natural formation, but the geologic origin of a structure of this nature is uncertain. It is an intriguing problem, however, considering that cultural debris was found in the lower excavated levels, up to four feet deep. Several feet of sand containing occupational debris must have accumulated on the knoll subsequent to the deposition of the earliest cultural remains.

Twenty test pits, each five feet square, were excavated in this area. In an attempt to obtain a representative sample and as much information as possible in the short time available for work at the site, the test pits were spaced at intervals over the entire area (Fig. 14). The deepest levels of the excavation, level 7 or 3.5 to 4.0 feet below the ground surface, revealed few cultural materials—only one scraper and a few flint chips. The excavations were terminated at this depth.

The profiles of the knoll (Fig. 15) indicate a lack of natural stratigraphy such as soil lines or other indications of a hiatus in the knoll formation. The plow zone, in the top 5 or 6 inches of Area B, was a light gray, sandy soil in which there were numerous grass roots. Below this lay a dark, sandy, humus soil that contained bone scraps, charcoal flecks, stone flakes, and other cultural residue. This zone varied in thickness from .5 to 2.0 feet but averaged about 1.5 feet. Beneath the dark gray, sandy soil a zone of lighter gray sand, frequently mottled with a whiter sand, was encountered. Work was stopped when this zone failed to yield sufficient materials to warrant continued excavation. The post-hole digger revealed that this zone was about 3 feet thick, and excavations were generally confined to the upper one foot of the zone. This light gray sandy soil rested on yellow clay bedrock that contained orange-colored stains. This clay zone appears to be the same as that which underlies Area A.

While cultural debris was recovered throughout the knoll, a horizontal distribution analysis of the material revealed two areas of occupation concentration—one on the north side of the knoll and one on the south side. In comparing the material from these two areas on a typological basis, no differences were noted. A vertical distribution study of the materials from the two areas also failed to reveal any differences; therefore, the two areas were lumped as a unit in the final analysis.

Area B, in contrast to Area A, had little evidence of occupation exposed on the surface. Only 27 sherds, 2 fragments of ochre, 1 worked stone object, and one scraper of the Scraper II form were found on the surface.

Dart Points

Few of the dart points from Area B could be identified with previously defined types. The majority (88%) of the points have contracting stems and probably are related to the Gary tradition. The dart points were concentrated in levels three and five, but this does not necessarily indicate heavier occupation in those two levels because of the small sample and the possibility of sampling error (Table 5). Sherds, arrow points, and other artifacts do not indicate a concentration in any specific level.

Arrow Points

Although four arrow points from Area B were found in the fourth and fifth levels (1.5 to 2.5 feet below the surface) the big majority

TABLE 5

Vertical Distribution of Dart Points at Area B

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*
Gary D1	4	2	5	1	5	2
Gary D2	....	1	3	....	1	....
Gary D3	....	....	2	2	....	1
Gary D5	....	....	3	....	1	....
Gary D8	....	....	....	1	2	....
Gary D11	....	....	....	....	1	....
Gary D12	....	....	....	....	1	....
D20	....	1	....	....	....	....
D21	....	....	....	....	1	....
D22	....	....	1	....	....	....
Trinity	2	....	....	....	....	....
Totals	6	4	14	4	12	3
Percentages	14%	9%	33%	9%	28%	7%

were concentrated in the top three levels. Those found below the upper three levels may be the result of rodent or other disturbances. No definite stratigraphic differences within the arrow point category could be determined, but the expanded stem arrow points, in all except one case, were found in the deeper levels from level two to level five. In level three they comprise over half the total number recovered. Whether these differences are meaningful is uncertain since the sample of arrow points from Area B is small. The overall distribution of the arrow points, in any case, shows a significant increase from the lower to the upper levels (Table 6).

Sherds

As in Area A, sherds were the most abundant of all artifacts recovered in the excavations at Area B. They include types Canton Incised, Sanders Plain, and Sanders Engraved. In all, 290 sherds were found, having a vertical distribution as follows: Level 1, 81; Level 2, 95; Level 3, 61; Level 4, 35; Level 5, 13; and Level 6, 5. The small number of sherds in Levels 5 and 6 suggest that these may have been a result of disturbances which resulted in the displacement of the sherds from higher levels.

Of the 290 sherds, only 31 or 11% were decorated. The decoration was in the form of slipping, polishing (only on slipped vessels), incising, engraving, and punctating of both the fingernail and stick varieties. Incising was the most popular form of decoration with 17 of

TABLE 6

Vertical Distribution of Arrow Points in Area B

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*
Expanding stem						
A1	....	1	1	....	1	....
A2	....	....	1	....	....	....
A4	....	....	1	....	1	....
A5	....	1	1	....	....	....
A6	1	....	....	....	....	....
Non-expanding stem						
A7	2	1	1	....	....	....
A9	1	....	....	....	....	....
A11	1	1	....	....	....	....
A15	....	....	....	1	....	....
A17	1	2	....	....	....	....
A1ba	....	3	2	....	....	....
Bonham	2	1	....	1	....	....
Cliffton	2	....	....	....	....	....
Perdiz	1	1	....	....	....	....
Totals	11	11	7	2	2	0
Percentages	33%	33%	21%	6%	6%	....

the 31 decorated sherds showing incised designs. Most of the designs consist of cross hatching spaced so as to create large or small diamond-shaped elements. These are common on type Canton Incised as described by Krieger (1946: 185–190).

The engraved designs are the same linear cross hatched designs found on the incised sherds. The work on both the engraving and incising is careless and occasionally "parallel" lines nearly touch.

Three vessel forms are suggested by the sherds found at Area B—bottles (Sanders Plain type), carinated bowls (Sanders Plain type), and deep bowls with slightly flaring sides (Canton Incised type). The one base sherd recovered is of the flat disc form.

Miscellaneous Artifacts

An analysis of the vertical distribution of artifacts other than sherds, arrow points, and dart points, shows that they were concentrated in the upper levels (one through four) of Area B, with a scarcity of miscellaneous implements in levels five, six, and seven.

TABLE 7

Vertical Distribution of Miscellaneous Artifacts From Area B

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*	*Level 7*
Knife I	....	1	1	....	....	....	....
Knife II	....	1	....	1	....	2	....
Knife III	....	....	1	....	....	....	....
Corner-tang knife	....	....	1*	....	....	....	....
Scraper I	1	....	1	....	....	....	....
Scraper II	....	....	....	1	....	....	....
Scraper III	1	....	1	....	....	....	....
Scraper IV	1	1	....	....	....	....	....
Biface I	2	3	2	3	....	....	1
Drill II	....	1	....	....	....	....	....
Drill III	....	....	....	....	1	....	....
Hammerstone	....	2	....	....	....	....	....
Hand stone frags.	1	....	1	....	....	....	....
Pecking pebble	....	....	....	1	....	....	....
Pitted stone	....	....	....	1	....	....	....
Pitted paintstone	....	....	....	1	....	....	....
Totals	6	8	8	8	1	2	1
Percentages	18%	23%	23%	23%	3%	6%	3%

Paint Pigments

One hematite specimen was found with indications of use as paint pigment. It is a thick piece with a pit hollowed out on one side. The interior of the pit shows evidence of heavy scratching.

Negative Features

No artifacts of bone, antler, shell, and polished stone were found in Area B, nor were there burials, pits, post molds, and other evidence of a sedentary occupation of the area.

Area B failed to produce any evidence of agricultural activities by the people who occupied the site. The presence of a small amount of bone and a few mussel shell fragments suggests that the subsistence pattern of these people was one concerned primarily with hunting and gathering. Identified bones were mostly of the deer, although several fragments of opossum and raccoon mandibles were also found.

*Although in level three, this specimen was on the flank of the knoll and next to the clay subsoil.

Discussion

Area B had a few sherds and arrow points in the lower levels, but because of extensive disturbance by rodents it appears likely that some or all of these are intrusive from the upper levels. While the general trend toward increasing use of pottery and the bow and arrow is obvious, it cannot be determined with absolute certainty whether or not the earliest occupants of Area B had one or both of these traits as minor items of their cultural inventory.

The sequence and trend of events at Area B are basically the same as those of Area A, but the thickness of the deposit suggests that the time span at Area B may have been longer. There was a time at Area B when the people who occupied the area used many dart points and few if any arrow points or pottery vessels; subsequently, however, the dart points gradually lost in popularity as pottery and arrow points became increasingly more popular (Fig. 17, E, F, G, H, and Fig. 18).

Some of the pottery from the upper levels can be typed as Sanders Plain, Sanders Engraved, and Canton Incised. The clay pipe and clay pipe stem from these levels are also characteristic of the same pottery tradition. The presence of these pottery forms suggests that the materials from the upper levels of Area B resulted from a Sanders Focus occupation, while the materials from the lower levels are representative of peoples of the Archaic Stage.

Area C

Area C is a large, flat, sandy area located in the floodplain about 1250 feet south and slightly west of Area B (Fig. 2). This spot is an "island" of grayish, sandy soil completely surrounded by the black gumbo soil characteristic of the region. It is oval in shape and on the southwest edge merges with another sandy area. Area C is approximately 125 feet long and 75 feet wide. The center of the area is approximately one half a foot higher than the edges of the area. The profiles (Fig. 16) show that this sandy soil rests in a shallow depression in the underlying clay subsoil. Again, as in Areas A and B, the geologic history and the origin of the sandy soil in Area C is unknown, but as the sandy fill accumulated in the depression there was intermittent prehistoric occupation of the spot.

The presence of cultural debris on the surface of Area C, plus the initial check with a post-hole digger indicating that the deposit had depth, prompted the excavation at that location.

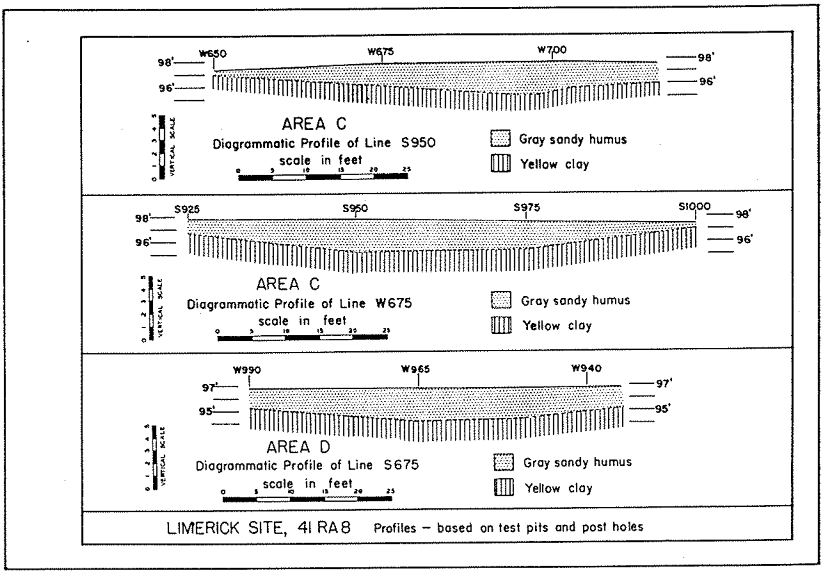

Fig. 16. Diagrammatic profiles at the Limerick site, Areas C and D.

Ten five-foot test squares were excavated (Fig. 2). At those preliminary test squares where cultural debris was heaviest, adjacent squares were excavated. In some pits the excavation went down to and included the sixth level, or 2.5 to 3.0 feet below the ground surface; in others the excavations were terminated with the first level.

In terms of classes of artifacts, Area C differs significantly from Areas A and B. Sherds, which were abundant in Areas A and B, were exceedingly rare in Area C, only 2 small ones being found. Area C, however, yielded many dart points as well as a few arrow points.

Dart Points

Dart points were found in all of the excavated levels of Area C, increasing in frequency from the lower to the upper levels. The Gary D1 form was by far the most common. In general, the majority of the dart points found in Area C were of the contracting stem tradition. However, there were some points characteristic of the Elam Focus of the Trinity Aspect, and these tended to be concentrated in the lower levels (Table 8).

Arrow Points

The arrow points found in Area C were concentrated in the upper three levels. None were encountered below the bottom of the third level. The small sample was far from homogeneous and several forms were represented.

Miscellaneous Artifacts

An analysis of the vertical distribution of the miscellaneous artifacts indicates a clustering of artifacts in level five and a concentration of artifacts in levels one, two and three (Table 10).

TABLE 8

Vertical Distribution of Dart Point Forms

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*	*Level 7*
Gary D1	13	4	6	5	1	....	1
Gary D2	1	....	....	1	....	....	....
Gary D3	2	1	1	1	....	....	....
Gary D4	1	1	1	....	....	....	....
Gary D5	1	3	....	2	....	....	....
Gary D6	4	1	....	2	....	....	....
Gary D7	....	1	1	....	....	....	....
Gary D13	....	....	....	1	....	....	....
Gary D14	1	....	....	....	....	....	....
Gary D15	....	1	....	....	....	....	....
D23	....	....	1	....	....	....	....
Elam	....	....	1	....	....	....	....
Trinity	....	....	....	....	2	1	1
Point frags.	4	1	4	1	1	1	....
Totals	27	13	15	13	4	2	2
Percentages	36%	17%	20%	17%	5%	2%	2%

TABLE 9

Vertical Distribution of Arrow Points in Area C

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*	*Level 7*	*Surface*
Expanding stem								
A2	1	....	....	....	....	....	....	....
A4	2	1	....	....	....	....	....	....
Non-expanding stem								
A7	1	1	....	....	....	....	....	....
A10	....	1	....	....	....	....	....	....
A11	....	1	1	....	....	....	....	....
A13	1	....	....	....	....	....	....	....
A14	1	....	....	....	....	....	....	....
A16	....	1	....	....	....	....	....	....
A18	1	....	....	....	....	....	....	....
Alba	....	....	....	....	....	....	....	1
Bonham	....	....	....	....	....	....	....	1
Fragments	2	2	1	....	....	....	....	....
Total	9	7	2	0	0	0	0	2
Percentages	50%	39%	11%	....	....	....	....	....

TABLE 10

Vertical Distribution of Miscellaneous Artifacts from Area C

Forms	*Level 1*	*Level 2*	*Level 3*	*Level 4*	*Level 5*	*Level 6*
Drill II	2	1	....	....	....	....
Sherds	2	....	....	....	....	....
Scraper I	1	....	....	....	....	....
Scraper III	5	2	2	3	3	1
Scraper V	2	....	1	....	3	....
Biface I	5	4	6	1	9	2
Biface II	2	3	2	1	1	....
Gouge I	....	....	....	....	1	....
Knife IV	1	1	2	1	....	....
Pecking pebble	1	....	....	....	....	....
Grinding slab	....	....	....	....	1	....
Totals	21	11	13	6	18	3
Percentages	29%	15%	18%	8%	25%	4%

Negative Features

No evidence of any feature such as pits, post molds, burials, and hearths, was found, nor were there artifacts of polished stone, shell or bone.

Subsistence

A small number of animal bones was recovered in Area C. These consisted primarily of teeth caps of deer.

Discussion

The lower levels of Area C are characterized by the absence of arrow points and by the presence of dart points which may definitely be ascribed to the Archaic. Several traits of this occupation are similar to those which are characteristic of the Elam Focus of the Trinity Aspect. In the upper levels arrow points appear, suggesting that this Archaic culture acquired the bow and arrow and began to integrate it into a hunting pattern. The scarcity of materials recovered in Area C and the small amount of bone refuse imply that this area, like Areas A and B, was used as a temporary hunting camp.

Area D

Area D is another sandy "island" in the black gumbo floodplain similar to Area C. It is approximately 400 feet northwest of Area C and 1200 feet southwest of Area B (Fig. 2). This area is a larger version of Area C, consisting of a zone of sandy soil resting in a shallow depression formed in the sandy clay subsoil (Fig. 16). Area D's center, like that of Area C, is about one half a foot higher than the edges, and the area measures 160 feet long and 100 feet wide.

Area D was selected for excavation on the basis of the artifacts on the surface and the depth of the sandy soil as determined by preliminary testing with a post-hole digger. Three five-foot test squares were excavated along the W960 line to a depth of 2.0 feet, but since these tests produced only a small number of artifacts, no further testing was attempted. A total of only 22 artifacts was recovered and all except two specimens were found in the upper two levels. No features were encountered and no artifacts of polished stone, shell, or bone were found. The area lacked evidence of pottery.

It is felt that the sample from Area D is too small to be of much significance. The graphs, however, indicate that the same general trend is present at Area D as at the other areas: arrow points increase in frequency through time as dart points decrease (Fig. 18).

TABLE 11

Vertical Distribution of Artifacts in Area D

	Level 1	*Level 2*	*Level 3*	*Level 4*	*Surface*
Dart points					
Gary D1	2	....	....	1	....
Gary D5	....	1	....	....	....
Edgewood	....	....	....	....	1
Dart point fragments	....	....	....	....	2
Arrow points					
A4	1	1	....	....	4
A5	....	....	....	....	2
A6	....	....	....	....	1
A7	2	....	....	....	....
Alba	1	....	....	....	1
Arrow point fragments	....	....	....	....	1
Scraper V	....	2	....	....	....
Biface I	4	4	1	....	....
Gouge I	1	....	....	....	....
Pecking pebble	....	1	....	....	....
Total	11	9	1	1	12
Percentages	50%	40%	5%	5%	....

Comparison of Areas A, B, C, and D

When the materials from the various areas of the site are compared, they seem to be typologically similar in the main. Some dart point forms in the lower levels of Area C were different, but the other artifacts were much the same throughout the site. As a result of the typological similarities, the intra-site analysis was based on percentages and/or frequencies of the three principal artifact classes. For each area, the number of artifacts in each class was computed. Considering the small sample, a level by level comparison probably would not be valid; however, the general trend from the lower to the upper levels of each area is probably significant.

TABLE 12

Relative Percentages of Pottery, Arrow Points, Dart Points

	Pottery		*Dart Points*		*Arrow Points*	
Area	A	B	A	B	A	B
Level 1	84%	83%	5%	6%	11%	11%
Level 2	48%	86%	40%	4%	12%	10%
Level 3	20%	74%	60%	17%	20%	9%
Level 4		85%		10%		5%
Level 5		48%		45%		7%
Level 6		63%		37%		0%

For Areas A and B, the comparison was based on three classes—pottery, dart points and arrow points (Table 12). When comparing Areas A and B, the lowest level in each area should not be given full statistical weight because of the small size of the samples. The lines in Table 12 indicate marked percentage changes and the approximate division between the Archaic and Neo-American occupations.

For Areas C and D, where no pottery was recovered, the intra-site comparison has to be on the basis of arrow points and dart points only because—except for two sherds at Area C—pottery was not found in these areas. Table 13 compares the vertical distribution of dart points and arrow points for all of the areas. This may be an unwarranted comparison if the people responsible for the cultural debris in Area C and D were pre-pottery groups.

Interpretation of the Tables

The percentage Figures in Table 12 indicate that level 1 of Area A and levels 1 through 4 of Area B are possibly the result of occupation by the same people. This relationship is also indicated by typological

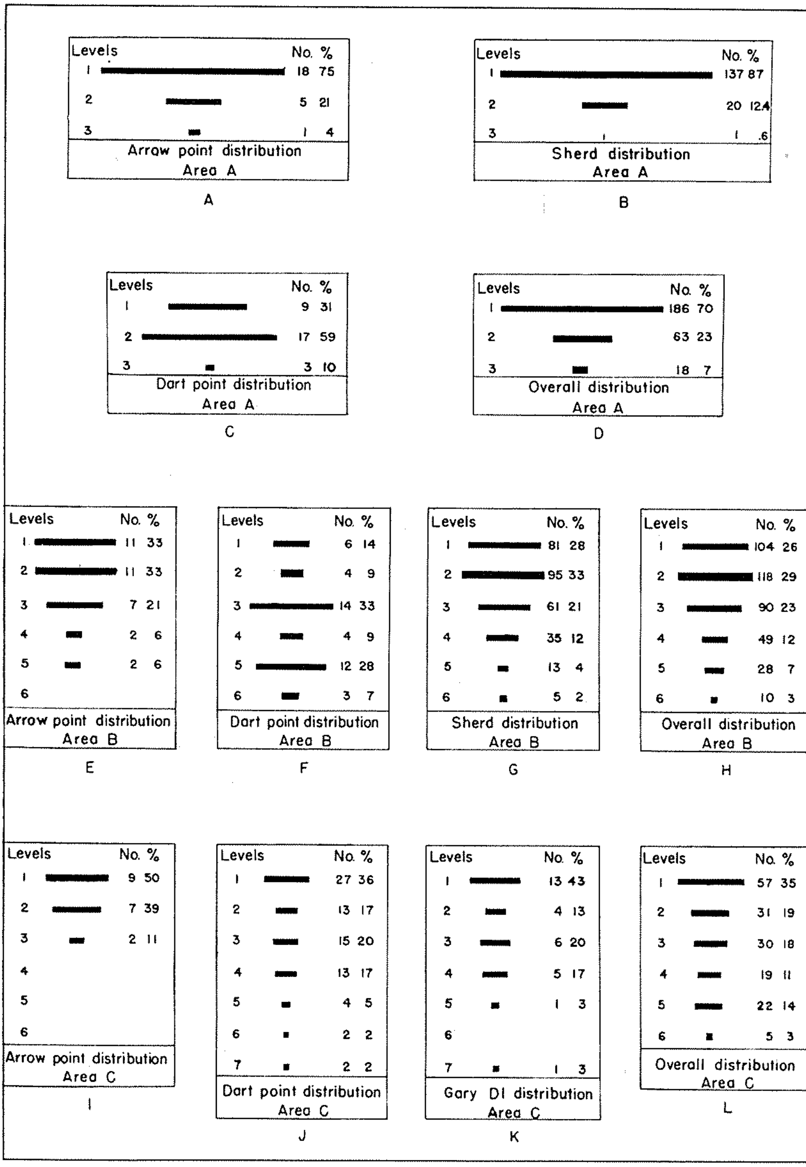

Fig. 17. Artifact distribution according to level at the Limerick site.

TABLE 13

Relative Percentages of Dart Points and Arrow Points

Area	Dart Points A	Dart Points B	Dart Points C	Dart Points D	Arrow Points A	Arrow Points B	Arrow Points C	Arrow Points D
Level 1	33%	35%	75%	33%	67%	65%	25%	67%
Level 2	77%	27%	65%	50%	23%	73%	35%	50%
Level 3	75%	67%	88%	100%	25%	33%	12%	0%
Level 4		67%	100%			33%	0%	
Level 5		86%	100%			14%	0%	
Level 6		100%	100%			0%	0%	

comparison. The ratio of pottery to dart points and arrow points in these levels is similar for both areas. Levels 3 and 4 of Area B, however, have more dart points than arrow points, a reverse of the situation in the upper levels of Area B and Area A.

As noted previously, Table 13 is open to question. If it is a valid comparison, then certain intra-site relations are suggested. It can be noted that using this method of comparison only levels 1 and 2 of Area B equate well with level 1 of Area A.

The figures for Area C indicate a high ratio of dart points to arrow points in the top 3 levels, a relationship that in the other areas of the site exists only in levels 2 and 3 of Area A and levels 3, 4, and 5 of Area B.

While the exact relationship of the various areas of the site remains uncertain, some relationships are indicated by the general trend which is basically the same in each area. This trend is toward the diminished use through time of dart points and the increased use of arrow points. In Areas A and B, the increased use of the arrow point is in conjunction with the increased use of pottery (Fig. 18).

Cultural Affiliations

In Areas B and C the artifacts, their provenience, and their associations indicate that two different groups of Archaic people once occupied the Limerick Site. While there are some typological similarities, there are also some differences. In both areas the contracting stem dart point was found, but the lower levels of Area C has, in addition, a concentration of other distinctive dart point forms. In the same levels with these dart points are other artifacts which have been found in association with these same dart point forms at other sites.

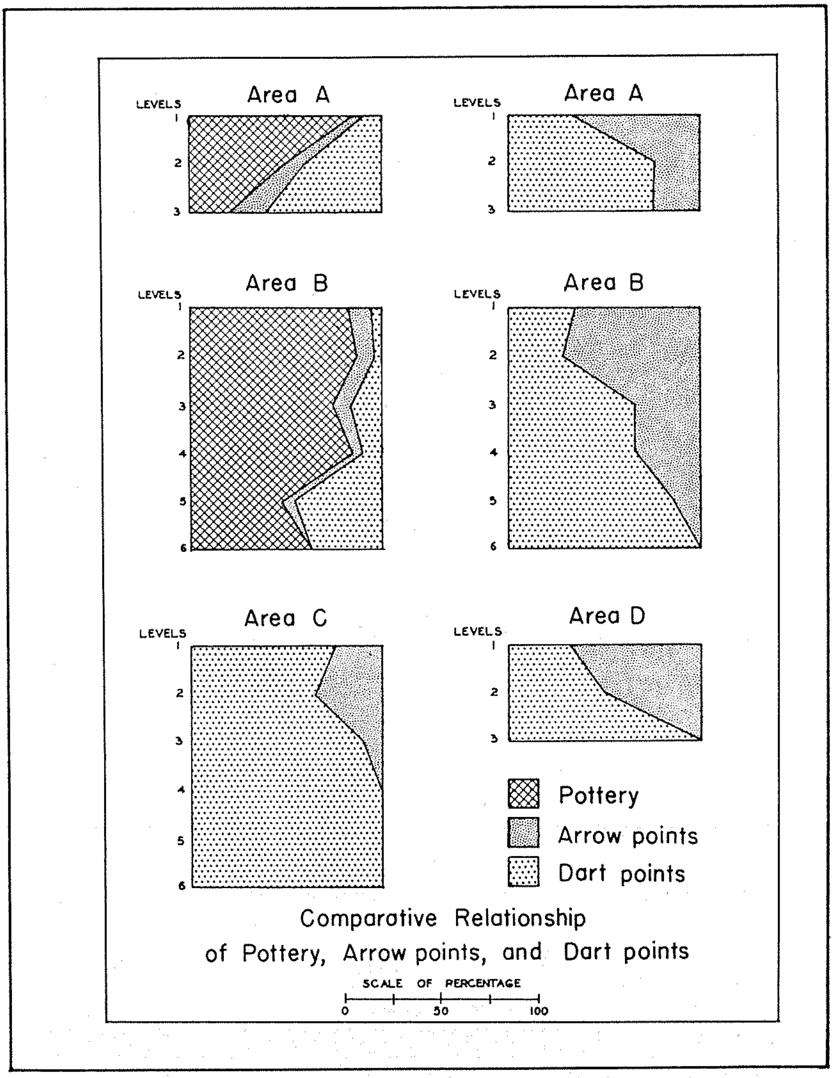

Fig. 18. Comparative relationships of pottery, arrow points, and dart points at the Limerick site.

Elam Focus Relationships

The cultural affiliations suggested by the assemblage of dart points and other artifacts in the lower levels of Area C are primarily with the Elam Focus of the Trinity Aspect. In order to differentiate the Elam

Focus from the preceding Carrollton Focus, the Elam Focus, in its definitive description by Crook and Harris (1952: 7–38), was partially defined on the basis of negative traits or traits which were absent in Elam but generally present in Carrollton. However, one of the major negative traits shared by Carrollton and Elam was the absence of arrow points. Arrow points are lacking in the lower levels of Area C.

Other traits characteristic of Elam Focus are the presence of Elam dart points, a few Gary dart points, leaf-shaped knives, scraping flakes, straight-edged gouges, and "turtle back" scrapers. This assemblage of traits is present in the lower levels of Area C.

Although there are several similarities, there are some differences between the lower levels of Area C and Elam Focus. Some of these differences may be due to the small sample of materials from Area C, which may account for the absence of the following Elam Focus traits: Ellis, Yarbrough, and Wells dart points, choppers, hammerstones, and manos. Also, the incidence of contracting stem dart points relative to other forms is much higher than has been previously reported for Elam Focus components.

Since the contracting stem dart point is more common eastward from the Limerick Site, and also since it evidently appeared later than some non-contracting stem forms (Wheat, 1953: 215; Tunnell, 1961), its presence in Area C's material culture configuration may be the result of the marginal location of the Limerick Site with respect to other Elam Focus sites; or it may be that the culture of these people existed slightly earlier or later than that of the Elam Focus proper.

Wylie Focus Relationships

A comparison of traits between the Limerick Site and the Wylie Focus shows distinct differences, although there are several traits which are common to both. Some of the traits shared with Wylie Focus are certain arrow point forms (A3, A5, A8, and A17); the Gary dart point forms D1, D3, and D8; some scraper, gouge, and drill forms; and Sanders type pottery. More significantly, those traits which are considered especially diagnostic of the Wylie Focus—large basin-shaped pits, bone artifacts, agricultural implements, Fresno and Harrell arrow point types, shell tempered pottery, and T-shaped drills,—are absent at the Limerick Site. The absence of Wylie Focus diagnostic traits indicates no major cultural relationship existed between the Wylie Focus and the Limerick Site.

East Texas Aspect Relationships

Suhm, Krieger, and Jelks (1954: 148–151) presented a provisional trait list for the East Texas Aspect of the Archaic Stage. A comparison of traits from the Limerick Site with this list shows marked similarity.

The provisional East Texas Aspect is characterized by the following traits: abundance of Gary type dart points, presence of Yarbrough and Edgewood points, Alba and other arrow points, T-shaped drills, fist axes, heavy end scrapers (gouges), sandstone nut stones, small milling stones, small manos, and pigments of hematite and limonite. Of these traits only the T-shaped drill is absent at the Limerick Site. Other traits in the provisional trait list stated to be rare or almost unknown were not found in the small sample of materials recovered from the Limerick Site.

A major difference is the presence of some pottery in what is generally a basic Archaic complex. Suhm, Krieger, and Jelks (1954: 150) comment that arrow points seem to have entered the East Texas area somewhat in advance of pottery. To the south, however, near Houston, Texas, Wheat (1953: Fig. 23) found in the Addicks Basin that pottery was introduced first into that area. To the southeast in San Augustine County, Texas, pottery appears before arrow points (Tunnell, 1961). To the north in eastern Oklahoma, Bell's data from the Scott Site (1953) indicates that granular clay tempered pottery was introduced into the Wister Reservoir area before arrow points. The Limerick Site data, while insufficient to permit comment on which was introduced first in the East Texas area in general, suggests that pottery and arrow points appeared at the site at approximately the same time.

The only evidence suggesting a prepottery-arrow point occupation is present in the upper levels of Area C. It will be recalled that the two top levels of Area C contained arrow points and a relatively scarcity (only 2) of potsherds, together with a relatively large number of dart points. In addition, the proportional percentages of the dart points and arrow points are different for this area. It is possible that these differences are the result of the use of the area as a temporary hunting camp.

Conjectures

The sample of materials from the Limerick Site is small and any conclusions reached herein are tentative. They are based, however, on the premise that the sample was representative unless otherwise noted.

The data from the Limerick Site suggest that there was an early Elam Focus occupation followed by a later Sanders Focus occupation showing some relationships with the Wylie Focus. A period of occupation, as used herein, is not a continual or specific occupation but rather it is a time span during which the site was probably occupied intermittently by groups of people having the same material culture.

The early occupation was by a pre-ceramic, pre-arrow point group with Elam Focus cultural affiliations. The evidence for this occupation was recovered in the lower levels of Area C.

The late occupation occurred at a time when pottery was well integrated into the material culture and when the bow and arrow complex was replacing the atlatl and dart. The arrow points were diversified in form and no one type seems to have dominated the arrow point category. The basic core tradition used in Archaic times was still present. The materials representative of this period were found in the upper level of Area A and the upper levels of Area B. The pottery tradition—including Sanders Plain, Sanders Engraved, Canton Incised and the Sanders clay pipe form—suggest that these people are culturally closely related to the people responsible for the Sanders Focus. Considering the number of dart points relative to arrow points, and the absence of "Plains" traits (alternate beveled knives, buffalo scapula hoes, etc.) as well as the ceremonial traits, the Sanders occupation at the Limerick Site may represent an early period of the Focus.

After categorizing some of the materials into these two periods, there remain some artifacts which can not be ascribed to either period. The materials from the lower levels of Area A and Area B do not appear to be closely related to either the Elam Focus or the Sanders Focus. This group possessed the small arrow point and Sanders type pottery tempered with bone and/or clay-grit. These traits, however, seem to be superimposed on a basically Archaic tradition because the dart point was the more popular projectile point form, and the other implements of this group, which included drills with unmodified bases, gouges, hammerstones, knives and blades, core implements and scrapers, etc., are basically the same as those used by Archaic groups. The materials and their relative percentages suggest that the people who made them could be included in the Archaic Stage of the East Texas Aspect. They do, however, probably represent a late component—possibly a group which was transitional. That is, they were basically Archaic and in the process of integrating the bow and arrow and pottery into their cultural system.

Other explanations of the Limerick Site are possible. A more categorical explanation follows the same general line as the above interpretation. The materials from the lower levels of Area C could belong to the Elam Focus and the lower levels of Area A and Area B could be components of the East Texas Aspect. The pottery and arrow points in these levels would, in this case, be attributed to natural disturbances and the artificial levels used in the excavations. As a result, all the arrow points and pottery found on the site would have been made by the people with Sanders Focus cultural affiliations. A new problem is created by this interpretation. Which Archaic group occupied the site first or did both groups occupy it concurrently? There is no evidence that the Archaic occupations of the site were contemporaneous, and there is insufficient data to determine which group was there first.

These are only tentative conjectures, and undoubtedly further excavations and analysis of materials from the areas surrounding the Iron Bridge Reservoir will provide a more stable frame of reference for the integration and interpretation of the archeology of the region.

Summary

The Limerick Site, on the Sabine River in Rains County, Texas is one of several sites to be inundated by the Iron Bridge Reservoir. The site consists of two knolls and several large sandy spots. Excavations were conducted in the knolls and on two of the sandy spots.

The materials were analyzed and classified by first grouping them according to material used in manufacture, *e.g.*, clay, stone. The groups were further subdivided into smaller groups based on general characteristics, *e.g.*, decorated and undecorated sherds, projectile points, scrapers, etc. These groups were further subdivided on the basis of similarity of forms, *e.g.*, engraved or incised sherds, expanding or contracting stems on projectile points, and in many cases these groups were again broken into smaller groups. This method of analysis differs from analysis by previously defined types where the materials are pigeonholed into previously established categories. In the present analysis groups of artifacts initially sorted on the basis of similarity in form within the site were assigned to previously established types only when all the necessary requirements for the type were fulfilled by the whole group.

The materials recovered indicate that there were at least two periods of occupation at the Limerick Site. These two occupations had evidence of influences from two defined foci—Elam and Sanders. In addition to these occupations, a third group lived on the site prior to the Sanders Focus people. It is suggested that the material culture of this third group represents a component of the East Texas Aspect. Whether these people possessed pottery and arrow points is a matter of interpretation of the data. Two possible explanations were offered, but because of the small size of the sample plus the lack of data from related sites, final conclusions must be withheld until further data become available.

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Indian Grinding Stones or Metates in East Texas

E. W. Hayner

In attempting to deal with the Indian metate in East Texas, we have a real problem on our hands. It is difficult to assign this artifact to any particular stage or culture, or to determine what was ground on it—whether corn or something else.

The American Indian must have been the world's busiest grinder, because so many of the things he used in his daily life had to be ground, and he had to do the grinding himself. This daily grinding of so many different things is the reason that we find so many pitted and milling stones of different sizes.

In East Texas, pitted stones are plentiful. Every camp site or village area has some of them, and at some sites they are very numerous. Most of the manos that are found here have pits in them. Some have one pit, and others are pitted on both faces.

However, it is not the purpose of this article to deal with the small pitted stone, or "nut stone," which occurs in all foci in East Texas, but rather to try to shed a small amount of light on the large grinding stone, or metate. This large type of grinder is not common in East Texas, and in the last few decades, when much of the farm land has been turned into pasture, the large grinding stones are not as easy to find as they once were.

I have worked on a large number of sites in this area, sites belonging to all three aspects—Archaic, Gibson, and Fulton—and have visited other sites which were being worked by other people. The metate is nearly always conspicuous by its absence. In fact, the metate is one artifact which is extremely hard to find.

The Indian grinding stones that are found here are made from different kinds of stone, some of them native to the area and others imported. All the grinders can be classed in one or the other two types, the small pitted or nut stone, and the metate with a large concavity. Many of the artifacts have pits or concavities on both faces.

A peculiar thing about the large grinders is that the concavities on some of them are rough, whereas on others the concavity is smooth, polished by use. Almost all of the small pitted stones have polished pits.

Many of the large grinders have a small pit in the center of the large concavity. Sometimes this combination occurs on both faces of the artifact. This combination of pits seems to indicate that the artifacts were used to grind some substance which could not be handled in one size of the pit alone.

It is not the purpose of this article to try to assess the uses and values of the various grinders. Rather, the writer wishes to correct some of the statements in the literature which, on the basis of his experience in finding a number of metates in place in prehistoric campsites, he feels to be in error.

Most of the people who write about the metate assign it to an agricultural culture. They do not seem to think that the Indian in the Archaic Stage could have had a use for the large grinding stone. However, four of the metates in my collection have come from Archaic sites. I am certain of this fact, because I found them myself. In addition, I found another specimen which I replaced in its bed at the site and covered it over again with soil.

This discussion is based specifically on a group of twelve metates, of which five are from sites which by current standards are judged to belong to the Archaic Stage. The other seven are from surface locations in different East Texas counties. In this group of twelve specimens, four are made from stones resembling rocks from glacial till. These four specimens are of a quartz-like or granitic material. Two other specimens are made from a compact hard claystone material, another is from hematite, and the remaining five are made of local ferruginous sandstone. In dimensions these specimens vary from 8 x 6 x 3 in. to 14 x 12 x 6 in. The concavities vary from 5 x 3 in. to 8 x 6 in., and are from 1 to 3 in. deep.

Brief descriptions of these twelve specimens, with their places of discovery, are given below. The numbers correspond to those in Fig. 1.

"Glacier-formed" stones, quartz-like and granitic material

#1. From Morris County; a surface find, site unknown. On each face of the stone is a large concavity which covers almost the entire surface. Within each concavity is a small pit.

#2. From Cass County; a surface find, site unknown. On each face of the stone is a large concavity, and in each concavity is a small pit.

#3. From Morris County; a surface find, site unknown. This stone has a large concavity on one face only.

#4. From Harrison County; from a proven Archaic Stage site. This stone has a large concavity on each face, and each concavity extends over the edge of the stone at the thinnest side.

Claystone material, source unknown

#5. From Gregg County; from a proven Archaic site. This stone has a large concavity on one face and a small pit on the opposite face.

#6. From Morris County; from a proven Archaic site. This stone has a large concavity on one face. The opposite face has no concavity or pit.

Ferruginous sandstone, source native

#7. From Harrison County, on the Hayner old plantation; a surface find, site unknown. This stone has a large concavity on one face, The opposite face is rough.

#8. From Morris County; a surface find, site unknown. This stone has a large concavity on each face.

#9. From Morris County; a surface find, site unknown. This stone has a large concavity on one face, with a small pit in the center of the concavity. The opposite face is rough.

#10. From Morris County; a surface find, site unknown. This stone has a large concavity on each face, with the concavities extending over the thin side of the stone.

#11. (not illustrated). From Gregg County, from an Archaic site. This stone is of hematite in a bad state of decomposition, and has a large concavity on one side. As is the case with most hematite tools, it is polished all over the surface. It is about average in size for a metate. After it was found, this specimen was replaced in the spot where it was discovered and covered over again with earth. This procedure was followed so as to be able to prove, without any question, that there were grinders of this type in the Archaic Stage. There is a witness to the find and the replacement.

#12 (not illustrated). From Gregg County; from the same Archaic site as #5. This stone has a depression on one face which seems to have been started as a large concavity but was finished to make a smaller pit, which is nevertheless much larger than the pit of the average nut-stone.

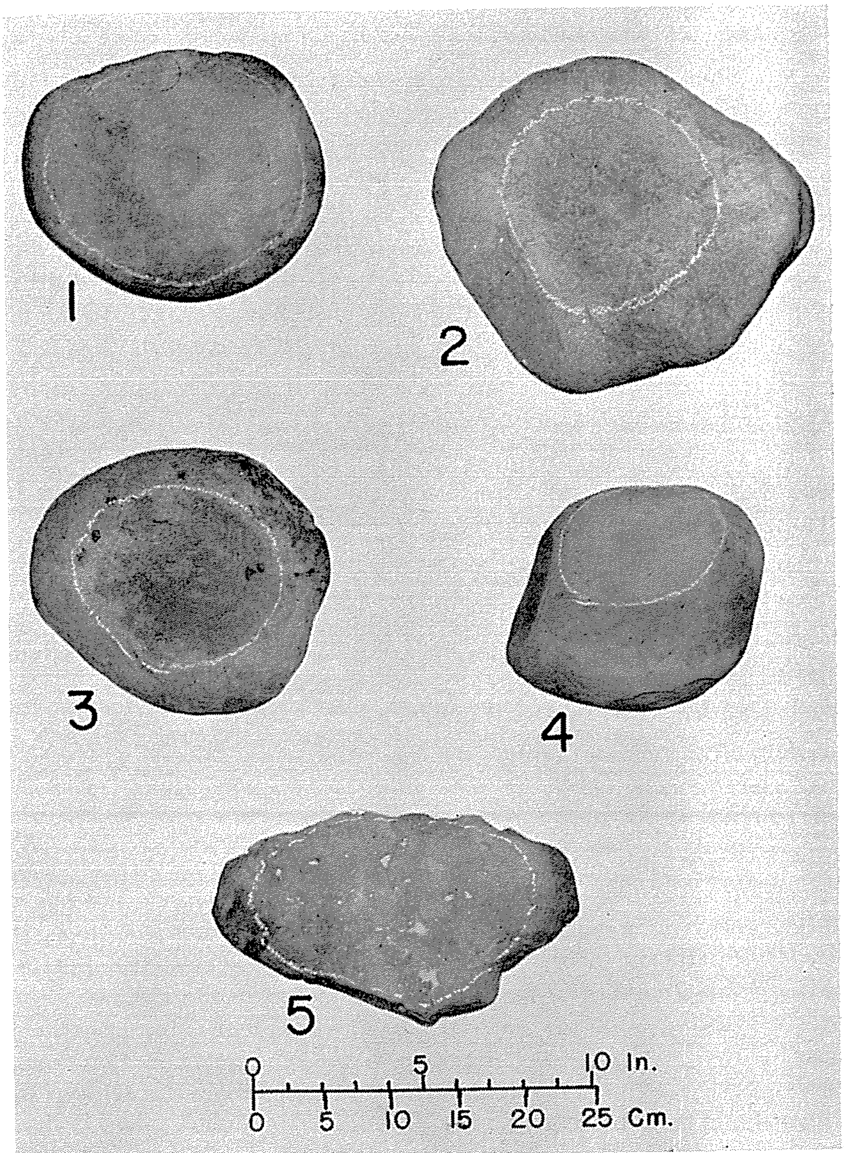
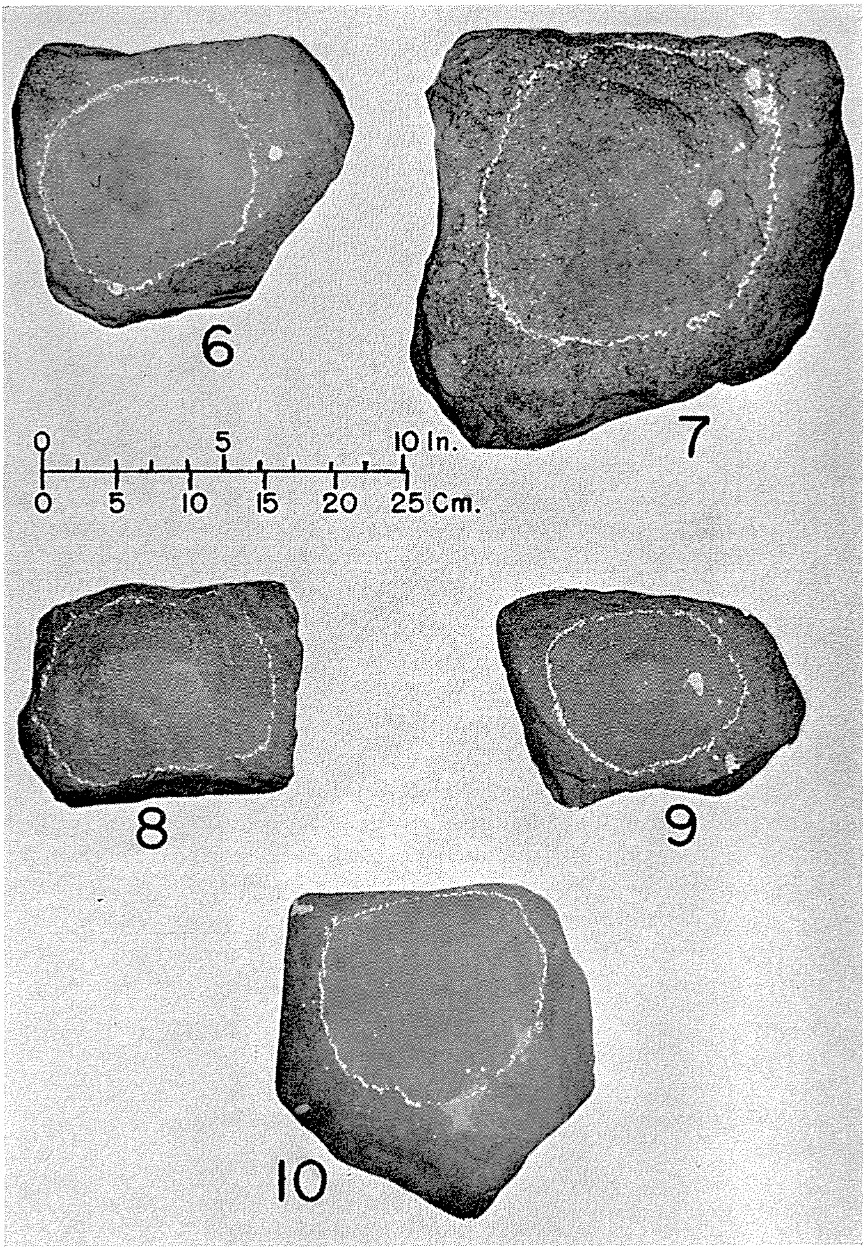


Fig. 1. Indian metates from East Texas, described in the text. Large concavities are outlined with white chalk. Small pits, present on specimens nos. 1, 2, and 9, are not marked but can readily be seen. Nos. 6, 7, 9, and 10 have been accidentally splattered with white paint.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0 5 10 In.
0 5 10 15 20 25 Cm.
8
9
10

Summary and Conclusions

As stated at the beginning of this article, when we try to deal with the Indian milling stone in East Texas, we have on our hands a problem which is as yet unsolved. The stones themselves are large enough so that it is unlikely they were buried accidentally. The writer has observed that most Indian campsites seem to have been cleaned by the process of spreading new or clean sand over the area. In this process the large grinder would not be covered as many smaller objects would have been. Also, being a large stone, and in most cases being near the surface, it is one of the first objects to be disturbed by the plow. Furthermore, if left on the surface by the Indians where last used, these stones are slow to become covered with organic matter through natural processes. Therefore, when found buried, it seems likely that they were buried intentionally.

In this paper twelve large grinders have been described; call them metates, milling stones, or whatever you wish—they are, in any case, Indian grinding stones. Of the twelve, five are from Archaic sites. I found them myself, and am certain of this fact. There is no way of knowing how many of the others are of Archaic origin.

This article has been prepared for the express purpose of proving that agriculture is not always implied by the presence of the metate. We assume that the Archaic Indians did not have corn; but they did have the metate. On the other hand, because of the fact that the later pottery-making Indians did have corn, most writers feel that the Archaic Indians did not have any agriculture.

The Indian grinding stone in East Texas, and in other areas of the state as well, has not had the attention which it deserves. Because of the Indians' methods of gathering and preparing food, the grinder had to be one of his most important tools, if not the most important. Perhaps someone will eventually have the time that is needed to give this important phase of Indian economy the attention that it deserves.

Kilgore, Texas

Evidence of a Late Archaic Horizon at Three Sites in the McGee Bend Reservoir, San Augustine County, Texas

CURTIS D. TUNNELL

Introduction

AN ARCHEOLOGICAL SURVEY of the McGee Bend Reservoir, located on the Angelina River in East Texas, was conducted in 1948 by R. L. Stephenson of the Smithsonian Institution (Stephenson, 1948). This survey marked the beginning of the Inter-Agency Archeological Salvage Program in this basin. A National Park Service field crew under the direction of Edward B. Jelks began test excavations at several sites in the McGee Bend Reservoir in the fall of 1956. During this season four sites were tested, including extensive work at the Jonas Short and Walter Bell sites. From Steptember to December, 1957, Jelks again conducted excavations at McGee Bend, and it was during this period that the sites covered by this report were tested.

The three sites under consideration here are the Runnells Site No. 1 (41-42D5-5), the Runnells Site No. 2 (41-42D5-4), and the Sawmill Site (41-42D5-9).* The following classes of artifacts were present at all three sites: dart points, arrow points, bifacially flaked blades, scrapers, pitted stones, various pottery types, and miscellaneous non-diagnostic artifacts.

There was very little depth to the midden deposit at Runnells No. 1, and the distribution of artifact types was of no temporal significance. The artifacts recovered from the test excavation of this site so closely resemble those from the other two sites that they are useful primarily for comparative and typological studies. The cultural material from

* In accordance with a new site designation system at The University of Texas, these sites are now numbered as follows: Runnells No. 1 (41 SA87), Runnells No. 2 (41 SA86), Sawmill (41 SA89).

this site will be only briefly discussed in this paper. The formal report of these excavations, which is being prepared by Jelks, will contain a complete discussion and analyis of each of these sites.

Runnells Site No. 2 and the Sawmill Site produced cultural material from the surface to a maximum depth of three and one-half to four feet. Observations in the field indicated a change in the artifacts from the upper to the lower levels of the excavations at both sites. This was a change in both quantity and kind. Cultural remains were most numerous toward the lower levels of the excavation. Potsherds were by far the predominant class of artifact in the upper levels, but they were gradually replaced in numerical superiority by dart points in the lower levels of the excavation (Figs. 9 and 14). Arrow points were also concentrated in the upper levels of the excavations at both sites, and their vertical distribution is similar to that of potsherds.

Apparently these sites were occupied intermittently over a relatively long period of time. There was no separation of occupations by clear-cut stratigraphic zones, but rather a gradual change from one stage into the other. This is perhaps due in part to soil conditions and disturbance by rodents. Some artifact types occur throughout all levels of the excavations, but these vary greatly in quantity according to depth.

This paper will attempt to determine the elements which characterize the late Archaic horizon that seems to be present at three of the excavated sites; to show how these elements fit into the later occupations of the sites; and to determine where in the occupational sequences the late Archaic stage terminates.

Statistical distribution studies were made for all three sites. The distributions of the principal types of artifacts were computed horizontally by five-foot test squares, but the results were not conclusive and will not be considered in this report. Vertical distribution of the major artifact types was charted both by arbitrary six-inch levels and by geologic zones at Runnells No. 2 and at the Sawmill Site. The results of these computations appear in Figures 9, 13, and 14, and will be discussed in some detail in a later section.

The archeology of this area of Texas is poorly known. This is especially true for the Archaic stage, and any correlation is difficult to establish because of the lack of published information on comparable material.

I wish to acknowledge the generous help of Edward B. Jelks and LeRoy Johnson, Jr. They have given suggestions and constructive criticism for which I am very grateful.

Description of the Area

Runnells Site No. 1 (41-42D5-5), Runnells Site No. 2 (41-42D5-4), and the Sawmill Site (41-42D5-9) are numbered according to the system adopted by the Council of Texas Archeologists and previously in use by The University of Texas. Unit 42D5 is located between 31° 10′ N. and 31°20′ N., and between 94°10′ W. and 94°20′ W. It lies in deep East Texas on the boundary between San Augustine and Angelina Counties (Fig. 1). This area is part of the "Piney Woods" section of the Texas Gulf Coastal Plain. As the popular name implies, the entire area is heavily timbered. The Angelina River flows toward the southeast in a broad shallow valley with a flood plain from one to two miles wide. Low clay ridges capped with sand border the flood plain on both sides. It is on these elevated areas that the sites discussed here are located.

The average elevation of the area is some 200 to 250 feet above mean sea-level, increasing toward the north. Various sandstones, hematite, limonite, chert, and silicified wood are found as natural gravels and were used by the Indians in the manufacture of artifacts. The average annual rainfall is about 60 inches and the river bottomlands have a heavy growth of vegetation. Most of the ridges above the flood plain of the Angelina are in cultivation or have been in the past. As might be expected, the animal life in the wooded sections is very abundant. A wide variety of deer, small mammals, birds, and reptiles can be observed today.

Description of Artifact Types

Not all of the artifacts recovered from the excavations are useful in differentiating and delimiting the Archaic horizon. Both diagnostic and atypical artifact types are described in some detail below. These include dart points, arrow points, bifacially flaked blades, and certain other miscellaneous stone artifacts. Minor types of artifacts which are present at only one site will be described in the section entitled "Site Description and Analysis." Artifact forms which make up a homogeneous group, but do not strictly conform to previously defined types have been assigned a distinguishing number. These tentative types will be referred to by number throughout this paper.

Projectile points are divided into two major groups: the small light arrow points which occur in the upper levels of the middens, and the larger heavier dart points which occur throughout the excavations, but are concentrated in the lower levels.

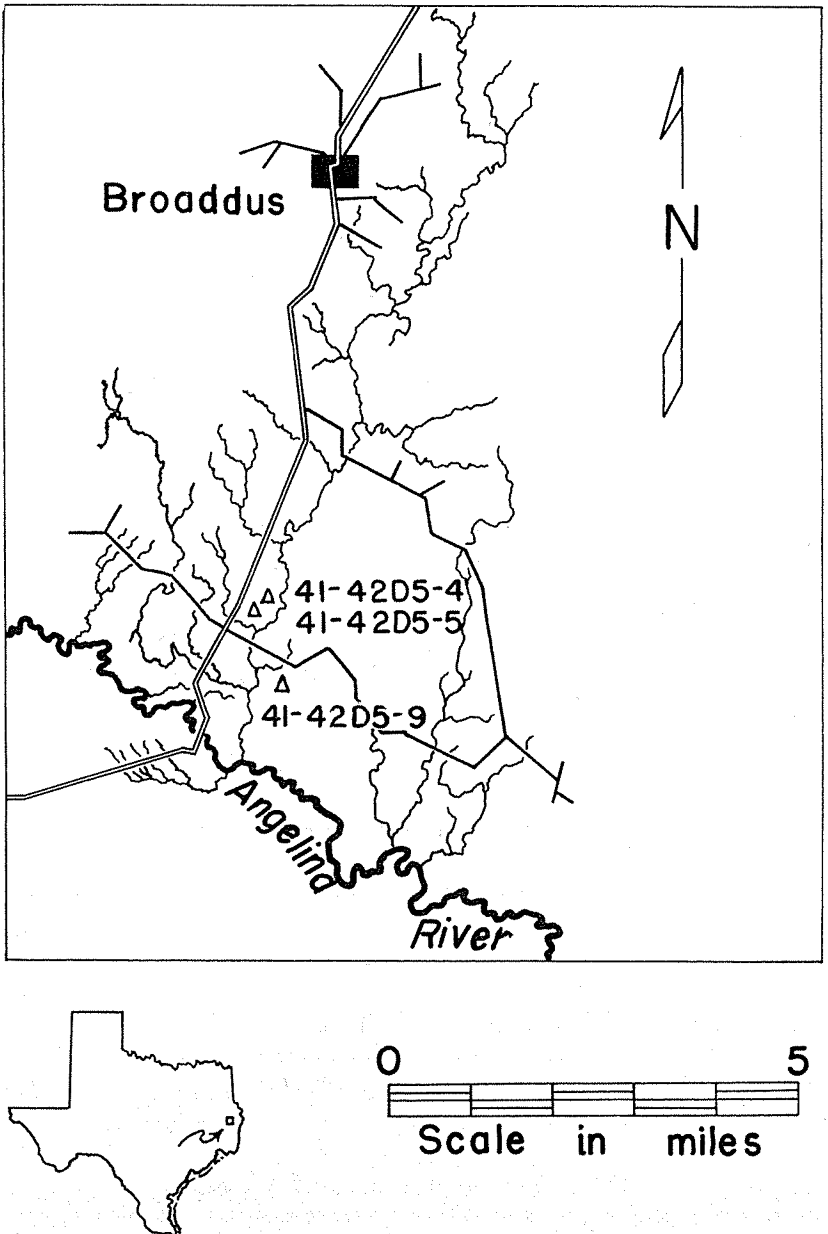

Fig. 1. Map of Unit 42D5 showing location of E. E. Runnells Site No. 1 (41–42D5–5), E. E. Runnells Site No. 2 (41–42D5–4), and the Sawmill site (41–42D5–9).

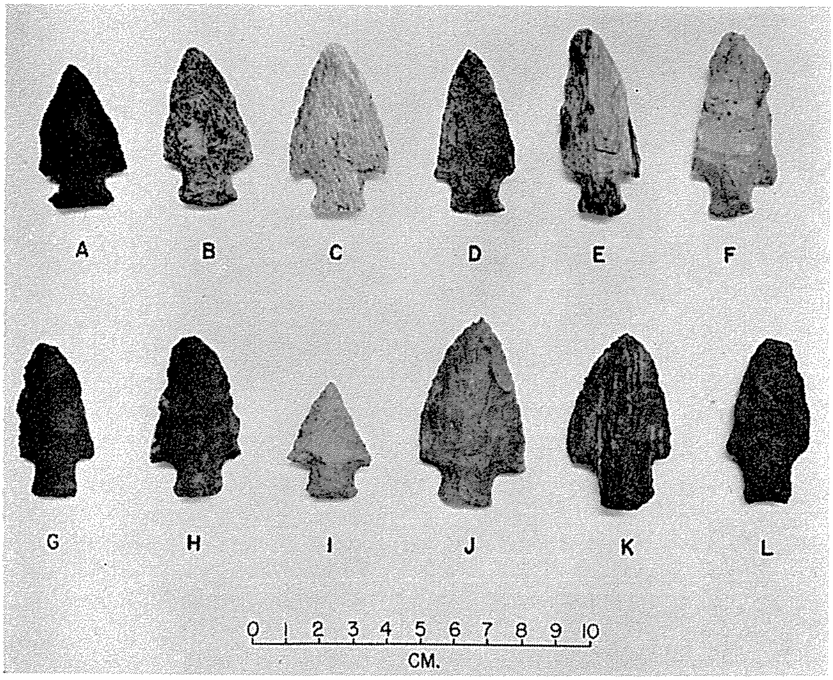

Fig. 2. Dart points, Type I. A-D, I-L, from Sawmill site; E-H, from Runnells No. 2.

Dart Points

Type I (Fig. 2). This homogeneous group of dart points resembles the Kent type as defined by Suhm, Krieger, and Jelks (1954: 432), but has a much larger percentage of expanding stems. These points are generally crude, and were shaped by the removal of large irregular flakes, although several of the smaller specimens show secondary pressure flaking. The blades are trianguloid with slightly concave or convex edges, and some examples have one edge concave and the other convex, giving a curved appearance to these artifacts. The shoulders, though usually poorly defined, are right-angular, and a few of the points have weakly developed barbs. There is an even gradation of stem shape from very slightly contracting, through parallel-sided, to well expanded. The general appearance of the stems is rectanguloid. Bases are either straight or convex. All of these points are made of local stone with silicified wood and chert occurring most frequently. Some points are fragmentary but appear to fall within the size ranges given in the following tabulation (measurements in centimeters):

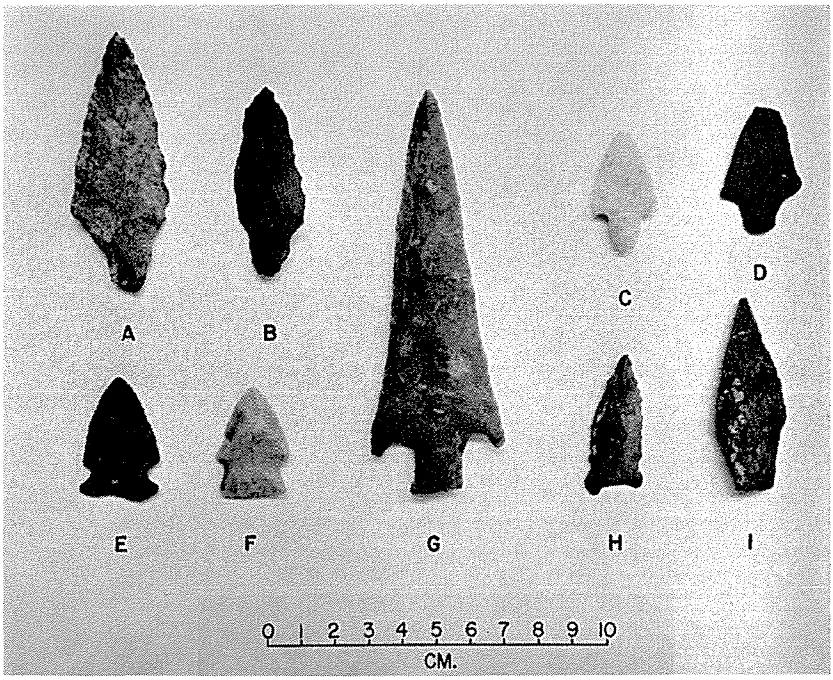

Fig. 3. Dart points. Gary points, A-D; Ensor point, E; Ellis point, F; Pogo point, G; Paisano-like point, H; Type II point, I. B from Sawmill site; all others from Runnells No. 2.

	Minimum	Maximum	Average
Length	2.7	6.0	4.2
Stem length	0.8	1.3	1.0
Width at shoulders	2.0	3.3	2.6
Stem width at base	1.0	1.9	1.4
Thickness	0.5	1.4	1.1

Types II and III (Fig. 3, I, for Type II). These types were found at only one site, and are described in the section entitled "Site Description and Analysis."

Gary Type (Fig. 3, A-D). These points (Suhm, Krieger, and Jelks 1954: 430) were found at all three sites.

Ellis, Ensor, and Pogo Types. These types, described by Suhm, Krieger, and Jelks (1954: 420, 422, and 398) are represented by one specimen of each type (Fig. 3, F, E, and G respectively).

Miscellaneous Forms. This category is set up to include all of those dart points which are of no diagnostic value in this report. These points vary widely in size and shape, but all are made of locally available stone. None of the points in this group fits any recognized type, and many of them are fragmentary.

Arrow Points

Alba Type (Fig. 4, A-F). Eighteen points from the excavations are included in this type. Most of these points conform strictly to the type description (Newell and Krieger, 1949: 161–163). Several, however, have blades with pronounced recurved edges and reverse barbs (A-C). All of these points are finely pressure flaked. They are similar in general appearance, fall within the same size range, and resemble points classified as Alba at other localities (Wheat, 1953: Plate 35, and Stephenson, 1952: 309).

Perdiz Type (Fig. 4, G-K). This type was recovered from Runnells No. 2 and the Sawmill Site. All specimens conform to the type as described in Suhm, Krieger, and Jelks (1954: 504).

Cliffton, Cuney, and Scallorn Types (Fig. 4, Cuney at O, Scallorn at N). These occur in small numbers in the upper levels of the excavations. Type descriptions are to be found in Suhm, Krieger, and Jelks (1954: 496, 498, and 506).

Miscellaneous Forms. Various additional arrow points were found at all three sites. These specimens are either too asymmetrically shaped or too fragmentary to classify.

Stone Drills

Type I (Fig. 4, L-M). These drills are long, narrow bifacially flaked implements with parallel sides and oval cross-section. One end is sharply pointed and the other is rounded. All specimens of this type are made of local chert and silicified wood. Several specimens are fragmentary but appear to fall within the size ranges given in the following tabulation (measurements in centimeters):

	Minimum	Maximum
Length	3.5	5.3
Width	0.8	1.0
Thickness	0.7	0.8

Blades

Bifacially flaked blades of various types were the most commonly occurring class of lithic artifact at these sites. These are tentatively

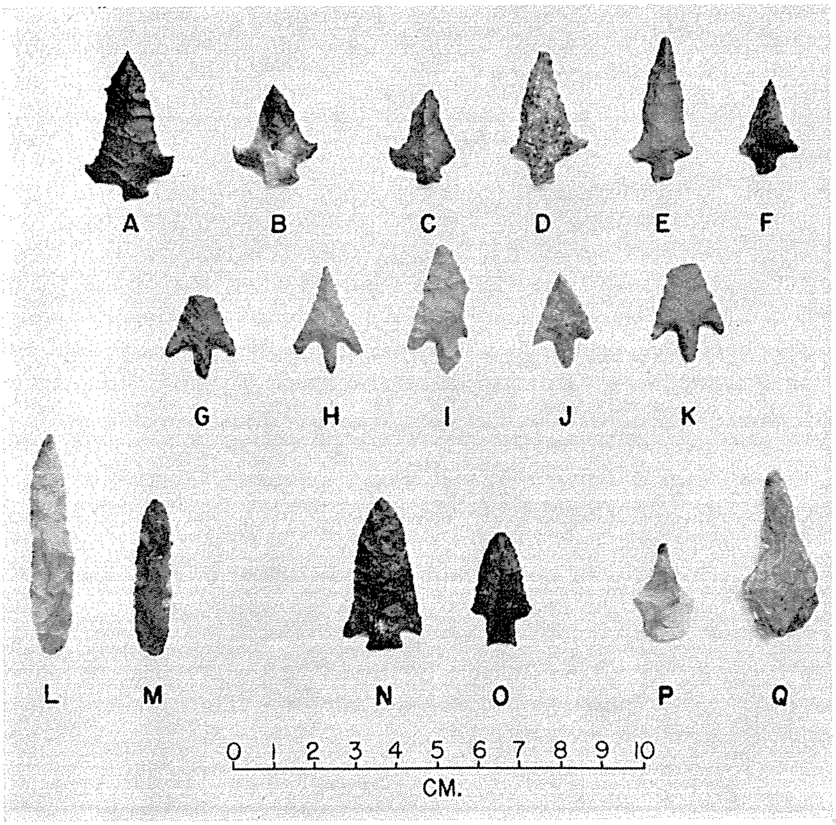

Fig. 4. Arrow points and drills. Alba points, A-F; Perdiz points, G-K; Scallorn point, N; Cuney point, O; drills, Type I, L-M; drills, Type II, P-Q. From Sawmill site, A, C-K, O; from Runnells No. 2, B, L-N, P-Q.

divided into five types. All specimens are made of coarse-grained petrified wood or weathered chert pebbles.

Type I (Fig. 5, E-H). These are long, thin rectanguloid slabs of silicified wood. One lateral edge and one or both ends are unaltered. One of the lateral edges on each specimen has been bifacially flaked into a straight or convex cutting edge. This easily recognized type of blade will be named and described in detail in the final report on the McGee Bend excavations. Several of these blades are fragmentary, but they appear to fall within the size ranges given in the following tabulation (measurements in centimeters):

	Minimum	Maximum	Average
Length	4.8	17.2	8.4
Width	2.4	6.0	3.6
Thickness	0.5	2.3	1.4

Type II (Fig. 5, A-D). These artifacts show a considerable range in size, but all have a distinctive characteristic. Each blade of this type has an unaltered base which is commonly capped with the cortex of the stone nodule used in its manufacture. All were made from locally occurring stones. The trianguloid blades are bifacial with straight to convex or slightly concave edges. A few have well developed distal tips, but most of them end in roughly rounded points. These artifacts form a distinctive type of blade which will be named and described in a forthcoming report by Jelks. In the following tabulation dimensions of these artifacts are given in centimeters:

	Minimum	Maximum	Average
Length	4.0	10.3	7.8
Width	2.0	4.1	3.2
Thickness	0.7	1.7	1.4

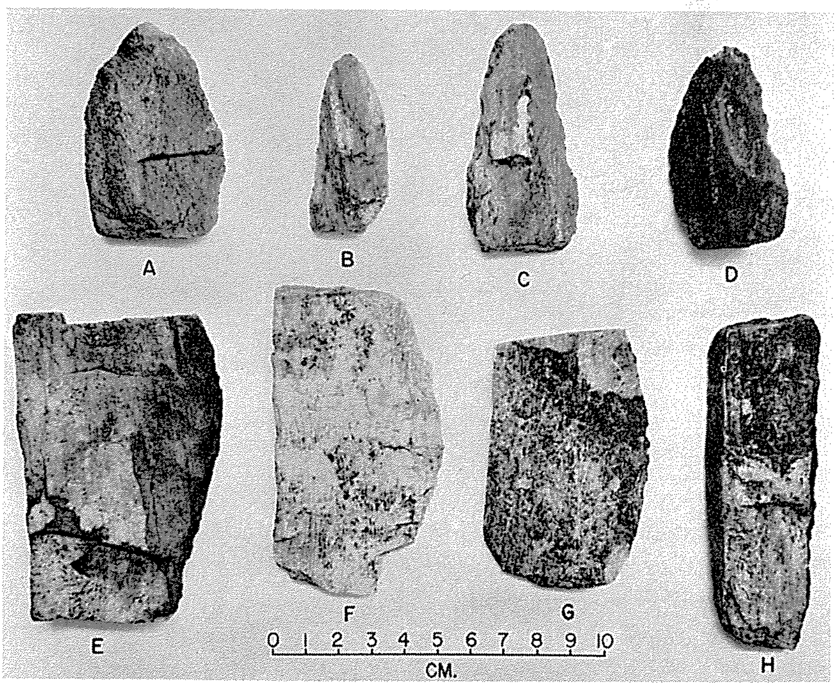

Fig. 5. Blades. Type I, E-H: Type II, A-D. From Runnells No. 2, A-D, F; from Sawmill site, E, G-H.

Type III (Fig. 6, A-C). This is a group of small, trianguloid bifacial blades that are oval to triangular in outline with straight or convex edges. These blades are lenticular in cross-section, often have well developed points, and bases are straight or convex. Dimensions (in centimeters) are given in the following tabulation:

	Minimum	Maximum	Average
Length	3.0	7.1	5.0
Width	1.5	3.5	2.9
Thickness	0.7	1.8	1.3

Type IV (Fig. 6, D-F). These blades closely resemble the group described above in shape and workmanship, but this group is considerably larger in size. These artifacts are oval in cross section, oval or trianguloid in outline, with straight or convex edges and convex bases. Dimensions (in centimeters) are given in the following tabulation:

	Minimum	Maximum	Average
Length	8.1	10.7	9.8
Width	2.4	4.3	3.4
Thickness	1.1	2.1	1.5

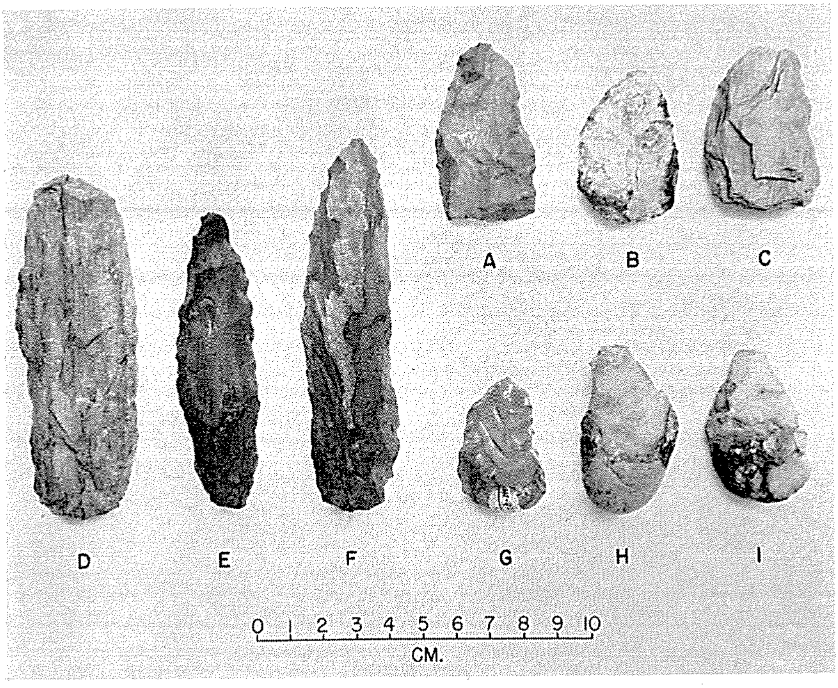

Fig. 6. Blades. Type III, A-C; Type IV, D-F; Type V, G-I. All from Runnells No. 2.

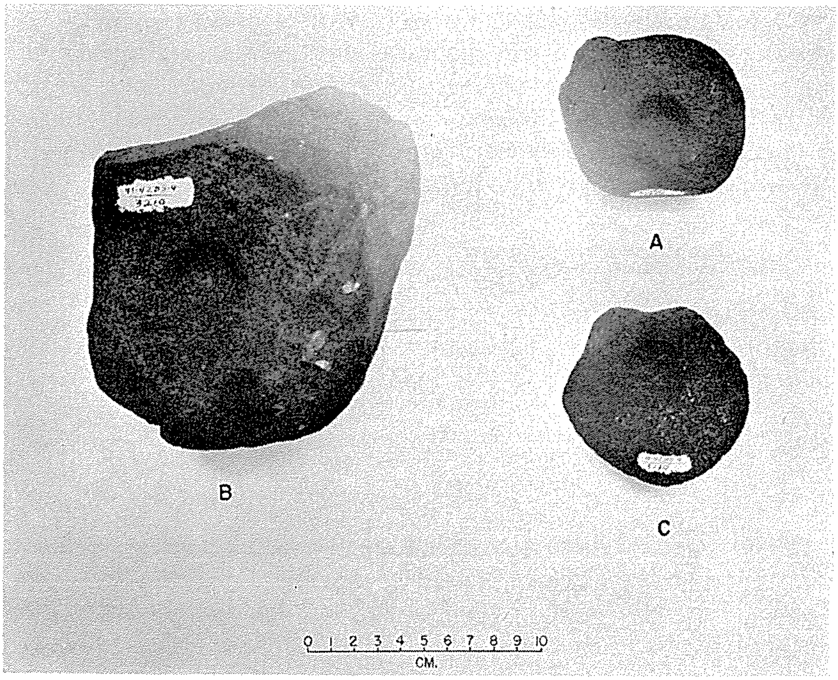

Fig. 7. Pitted stones from Sawmill site.

Type V (Fig. 6, G-I). These nodular blades (or worked stone nodules) all have similar physical characteristics. They are pebbles that are largely unaltered, but each has one end sharpened to a point by the removal of large flakes by percussion. In the following tabulation dimensions are given in centimeters:

	Minimum	Maximum	Average
Length	3.7	8.5	5.0
Width	2.4	3.9	3.1
Thickness	1.2	2.3	1.7

Miscellaneous Forms. Many blades and blade fragments are unclassifiable. All are made of locally available stone and none gives any indication of wide variations of size or shape outside the types described above.

Pitted Stones

Many large fragments of coarse-grained, dark brown hematite have been shaped into pitted stone implements (Fig. 7). There is much variation in size and shape, but each of these stones has one surface ground flat and a small circular pit pecked into the flat surface. It is thought that these stones were used as platforms for cracking the wild nuts that are so abundant in these woods (the nut being placed in the pit and struck with another stone). Dimensions (in centimeters) of these specimens are given in the following tabulation:

	Minimum	Maximum
Maximum diameter	8.0	15.9
Thickness	3.8	6.3
Diameter of pit	......	3.0
Depth of pit	......	0.8

Other minor types of lithic artifacts are described in the section entitled "Site Description and Analysis."

Pottery

Sand-tempered Plain Pottery. This coiled pottery is tempered with rounded quartz particles of variable size. Sherds are usually smooth both on the inside and outside, and they are medium to coarse in texture. Some sherds are almost pure sand, and these give the appearance of a fine-grained sandstone. Color ranges from light brown to dark brown and dark gray. No complete vessels of this type were recovered from the test excavations.

Clay- and Bone-tempered Pottery. This includes a large number of types that exhibit various surface decoration techniques. These sherds are limited primarily to the upper levels of the test excavations, and no attempt has been made to define the types represented.

Site Descriptions and Artifact Analyses

E. E. Runnells No. 2 (41-42D5-4)

This site is located on a low sandy ridge overlooking Harvey Creek (Fig. 1), which flows south and west into the Angelina River. During floods the Angelina overflows into the basin of Harvey Creek and inundates the flood plain at the base of the ridge. The site was named after the present land owner.

The occupation area is roughly oval in outline and has a maximum diameter of about three hundred feet. A grid system was used with the base stake on the southeast edge of the site and at an arbitrary elevation of one hundred feet. A five-foot wide test trench was excavated from NO–EO to N150–EO and from N150–W5 to N150–W250 (Fig. 8). The trench was excavated to a depth of one foot with cultural material recorded by six-inch levels. Five-foot square test pits were dug every fifty feet, and were taken to a depth of three or four feet by six-inch levels. All test pits and trenches were carefully cleaned and profiled, but no features could be detected. Test squares number N140–EO, N145–EO, N150–EO, N150–W5, N150–W10, and N150–W15 were all taken to a depth of four feet, and all produced cultural material in all levels down to three feet in depth. A compact red-mottled clay, which commonly underlies the sand on these ridges, was found at a depth of two feet at N50–EO, but it was not encountered in the deep test area mentioned above.

The sandy soil containing artifacts is of uncertain origin. There is no evidence of its being transported to the ridge top by human agency. An alluvial origin for the formation in this area would indicate considerable age for the deeply buried cultural material. At the present time the Angelina River deposits a relatively small amount of sediment during time of flooding. At its peak flood stage the river has never covered these ridges in historic times. If this sandy deposit is of alluvial origin, it indicates a much higher flood stage for the Angelina River in prehistoric times. This is a very interesting problem but one that is beyond the scope of this paper.

This ridge has been in cultivation in the past, and it was used as a house site by early Anglo-American settlers. At present it serves as a cow pasture and is covered with a good growth of grass. From the surface to varying depths is a brown sand geologic member (Zone III). Four divisions were recognized in this sandy member: humus-stained plow zone (III D); a fine tan sand (III C); a mottled tan and white sand (III B); and a whitish sand with some tan sand inclusions (III A). Geologic Zone II is composed of red-brown clay with small pockets of tan sand. Zone II merges with Zone I, which is a mixed red-orange and pale blue clay with scattered sand pockets. Cultural material occurs only in zones III D, III C, and III B.

The lithic artifacts from this site are made primarily of a coarse-grained silicified wood. The next most common material is a buff-colored chert, and several specimens are made of hematite, sandstone, and flint. The petrified wood has numerous microscopic flaws and fractures. Flaking techniques often produce irregular chips, and consequently the artifacts made of this material are usually crude. The chert occurs in the form of small river pebbles, and some patinated cortex appears on most of the artifacts made of this material.

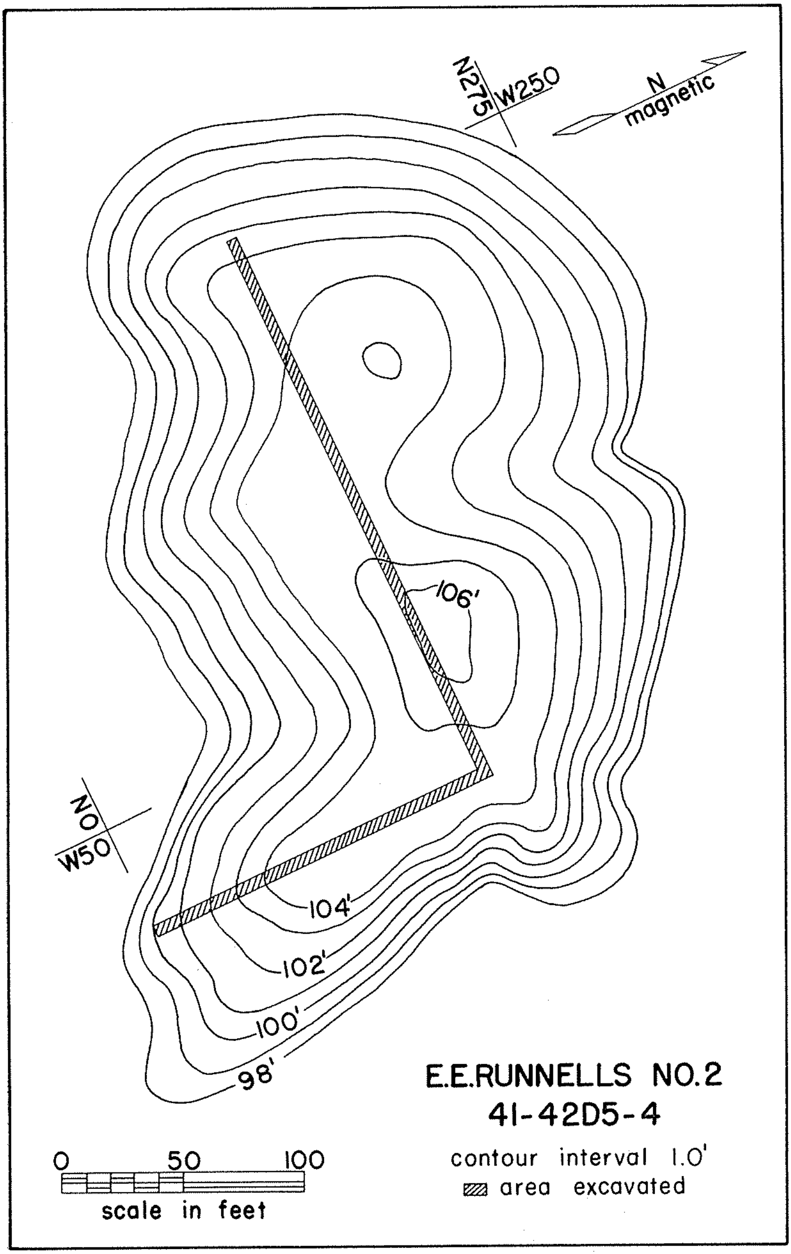

Fig. 8. Map of Runnells No. 2, showing area excavated.

Typological analysis of the lithic material was very time consuming. There are many variations within each type, and identification of individual artifacts is, in some cases, quite difficult. However, each of the artifact groups shows a surprising homogeneity. The numerous small variations are probably the result of poor raw materials and careless flaking techniques.

All of the lithic artifacts were first separated into groups according to form and supposed function (dart points, arrow points, drills, scrapers, blades, gravers, and ground stone artifacts). Each group was then divided into types according to stylistic variations (example: dart points—stem shape, blade shape, barbs, notches, size, flaking technique, etc.).

Dart Points. Thirty-four Type I dart points (Fig. 2) were found at this site. In the deep test pits (Fig. 9) these points were distributed as follows: three points in Zone III D–III C (mixed), surface to 1.5 ft.; three in Zone III C, 1 to 1.5 ft.; eight points in Zone III C–III B (mixed), 1.5 to 2.5 ft.; and five points were recovered from Zone III B, below 2.5 ft.

Five projectile points of the Gary type (Fig. 3, A, C-D) were recovered during the excavation of this site. Four of these points are very similar to each other in size and shape, and all four show fine pressure flaking. Three are made of buff-colored chert and one of milk quartz. The fifth Gary point is made of light brown chert and is about twice the length of those described above. Three of the Gary points occurred in Zone III D–III C (mixed), surface to 1 ft.; one in the Zone III C, 1 to 1.5 ft.; and the third was in Zone III C–III B (mixed), 1.5 to 2.5 ft. (Fig. 9).

One point of the Pogo type (Suhm, Krieger, and Jelks, 1954: 398) was found in Zone III C, 1 to 1.5 ft. This point (Fig. 3, G) is made of light gray mottled chert.

One dart point of the Ellis type (Suhm, Krieger, and Jelks, 1954: 420) is made of gray-white flint (Fig. 3, F). It was found in Zone III D, surface to 0.5 ft.

Another point (Type II) has a triangular blade with straight edges. This point shows very careful pressure flaking and is made of silicified wood. It has very slight shoulders and a long contracting stem with a straight base. The edges of the stem have been ground smooth from the shoulders to the base (Fig. 3, I). This characteristic is often associated with Paleo-Indian points. If this point is of Paleo-Indian origin, it is probably intrusive in this site, because no other evidence of Paleo-

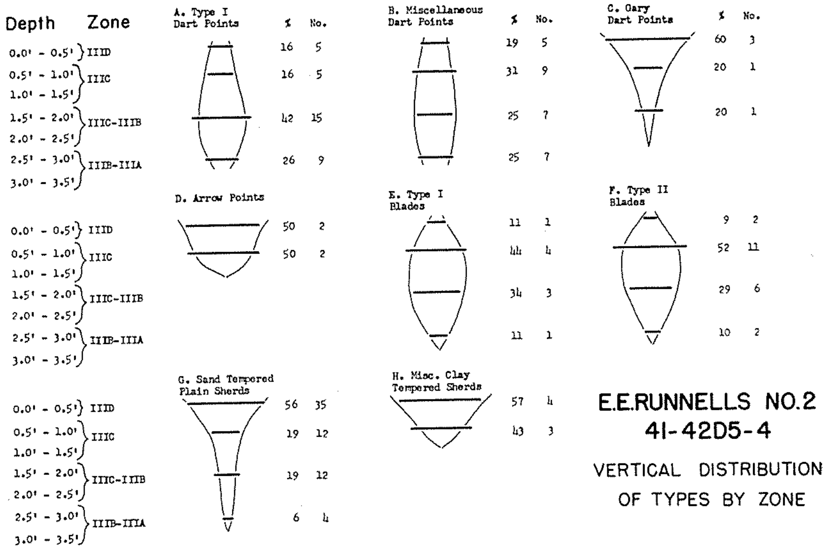

Fig. 9. Distribution of artifacts at Runnells No. 2.

Indian occupation was noted. This Type II point came from Zone III C–III B (mixed), 1 to 1.5 ft.

Another point, strongly resembling the Ensor type (Suhm, Krieger, and Jelks, 1954: 422) is made of dark brown silicified wood (Fig. 3, E). It was recovered from Zone III B, 2 to 2.5 ft.

Twenty-eight miscellaneous dart points are of no diagnostic value. One of these points (Fig. 3, H) has a concave base and shallow side notches. The blade edges are convex and serrated. It bears a superficial resemblance to points of the Paisano type (Suhm, Krieger, and Jelks, 1954: 460). All of the points in this miscellaneous group are made of coarse-grained silicified wood or of buff to gray chert. They were evenly distributed throughout the deep test area. Three occurred in Bone III D–III C (mixed); five were from Zone III C; four from Zone III C–III B (mixed); and four were from the lowest artifact-producing Zone, III B. The remaining twelve dart points of miscellaneous types were recovered from the long shallow test trenches.

Arrow Points. Only five arrow points were found in the test excavation of this site. One of these is a basal fragment of no diagnostic value. This group appears insignificant when compared to the 70 dart points and fragments. Three of the four complete arrow points are of the Alba type with "reverse" barbs (Fig. 4, B). All of these points occurred in the upper zones III D and III C, surface to 1.5 ft.

The other complete arrow point is a finely worked specimen of petrified wood (Fig. 4, N). This point has a narrow triangular blade, slightly convex edges, well-developed barbs sloping downward, corner notches which form an expanding stem, and a straight base. It resembles arrow points of the Scallorn type (Suhm, Krieger, and Jelks, 1954: 506), and was located in Zone III D, surface to 0.5 ft.

Drills. Ten artifacts recovered during excavation of this site are classified as stone drills. Seven of these are Type I drills (Fig. 4, L, M). These artifacts occurred at various depths throughout the excavation. The three remaining drills are of a different type, here designated as Type II (Fig. 4, P-Q). Each has a broad flattened base and a short pointed bit that is oval to triangular in cross-section. The base of each of these drills is bifacially flaked. Drills from this site have the following measurements (in centimeters):

	Minimum	Maximum
Length	2.4	4.0
Bit length	1.0	1.7
Bit width	0.5	0.8
Base width	1.4	2.0
Thickness	0.4	0.7

Gravers. Two gravers were found in Zone III D–III C (mixed). The larger of the two, made of reddish brown chert, is trianguloid with one straight unworked edge and two bifacially worked slightly convex edges. The flaked edges come together and form a rounded beak. This specimen has the following measurements (in centimeters): length 2.8, width 2.7, beak width 0.8, thickness 1.0.

The smaller of the two gravers, a pressure-retouched flake of red-gray flint, is trianguloid in outline and has two unworked edges. The third edge is bifacially pressure flaked and may have been used as a scraping artifact. At one end of this edge is a small graver beak with a high dorsal ridge. Its dimensions (in centimeters) are: length 3.0, width 2.1, beak width 0.5, thickness 0.6.

Scrapers. In addition to the scraping edge on the graver described above, there are eleven other scraping artifacts. One of these is a small plano-convex end-scraper (scraper Type I) made from a flake of brown chert. It has a convex bit which contracts behind the bit and expands into the unworked flake body. Its dimensions (in centimeters) are: length 4.0, bit width 1.4, thickness 0.4. This scraper came from Zone III B–III A (mixed), 2.5 to 3 ft.

Six very small flakes of stone have finely retouched convex scraping edges (scraper Type II). These are of various shapes and all are unifacially flaked. Five are made of buff to gray chert. One made of silicified wood has two small scraping edges. Measurements (in centimeters) are as follows:

	Minimum	Maximum
Length	2.0	2.7
Width	1.5	2.5
Bit width	0.7	2.5
Thickness	0.3	0.6

Two long thin flakes (scraper Type III) have concave scraping edges (sometimes called spokeshaves). These are unifacially flaked and are made of buff and reddish chert. Measurements (in centimeters) on these two specimens are given below:

	Buff Scraper	Reddish Scraper
Length	2.6	3.7
Width	1.9	1.3
Bit width	3.2	3.0
Thickness	0.5	0.5

Another scraper is made from a thick flake of coarse gray chert. It is roughly triangular in outline and has a convex scraping edge, a notched edge, and an unworked edge. Its dimensions (in centimeters) are: length 5.6, width 3.8, width of convex scraping edge 5.3, length of concave scraping edge 1.7, thickness 1.5.

The last scraper in the series is a bifacially flaked petrified wood implement which was apparently made for hafting. It is oval in outline and has two deep notches in one side that form a stem opposite the long scraping edge. Its dimensions (in centimeters) are: length 2.4, width 2.0, thickness 0.5.

The scraping artifacts represent a very small percentage of the lithic artifacts from this site. They occur in all levels of the test excavation.

Bifacially Flaked Blades. The blades recovered from the excavation of this site are as follows: Type I, none; Type II, 21; Type III, 27; Type IV, 5; Type V, 13; and 36 miscellaneous blades. The distribution of blades of Types I and II is shown in Fig. 9.

Hammerstones. Ten large fragments of stone show extensive battering along one or more edges. Six of these are long pieces of petrified wood which are rectangular to triangular in cross section (Fig. 10). The other four are made of assorted local stones, and all are rounded in appearance. Most of these are battered along several edges and one

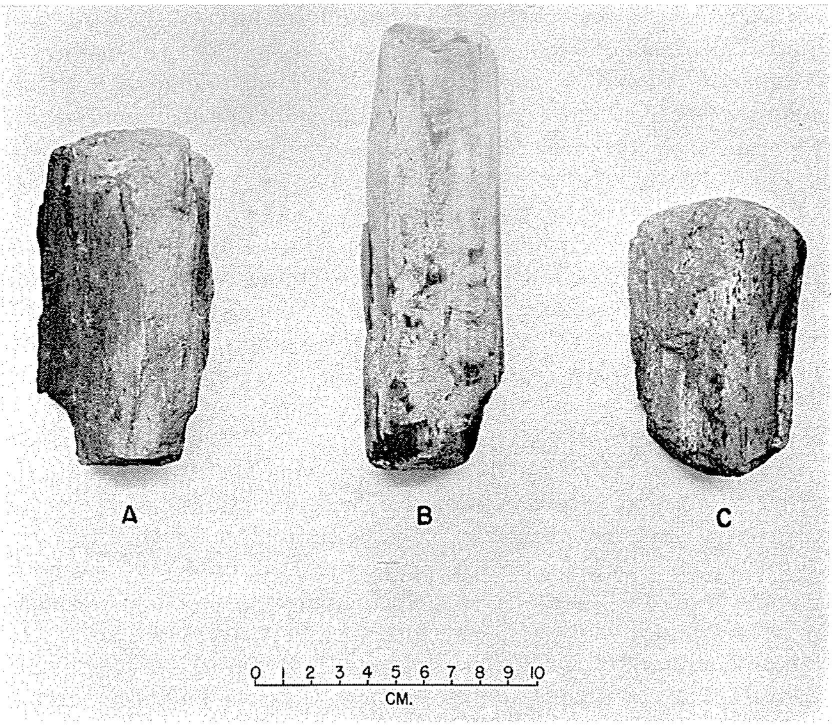

Fig. 10. Hammerstones from Runnells No. 2. All made of silicified wood.

shows evidence of grinding. Hammerstone dimensions (in centimeters) are given below:

	Minimum	Maximum
Length	9.0	14.9
Width	3.0	7.9
Thickness	1.6	5.1

Pigment. Red and orange pigment stones were found throughout the excavation. Nine of these stones are a fine-grained hematite and were used as a source of red pigment. Six others, fine-grained silt stones, were used as a source of orange pigment. All of these pigment stones show some evidence of cutting or scraping. In diameter they range from 1.5 to 8.2 cm.

Miscellaneous Objects. Fourteen pieces of burned sandy clay were found. These are irregular lumps and none shows intentional shaping. Stone cores and flakes occurred throughout the excavation in abundance.

Discussion. Runnels No. 2 seems to have been occupied intermittently during the late Archaic (pre-ceramic) stage. Evidence of this occupation is found in the levels below two feet (Zone III B) in the deep test area. A complete lack of perishable materials, features, and hearths leaves the definition of this occupation primarily to speculation. Cultural remains from these levels consist of lithic artifacts only. If bone, wood, and other perishable materials were used, they have long since disappeared. The lithic artifacts from this zone are as follows: Four Type I dart points; five miscellaneous dart points; seven Type I blades; nine miscellaneous blades; one Type I scraper; two Type II scrapers; one Type III scraper; two hammerstones; one Type I drill; and many stone chips. Three potsherds were found in disturbed earth near a rodent burrow in this level, and are probably intrusive from upper levels.

These artifacts indicate that the first occupation of this site was by small groups of nomadic hunters. These people probably erected temporary shelters, hunted local game animals, and gathered wild nuts and plants. The atlatl or spear thrower, used extensively by Archaic hunters, was probably the principal weapon. No arrow points were found in the lower levels of this site. Dart points of Type I were the predominant type occurring in Zone III B. Seven blades of Type I indicate that this type of artifact was a definite element of the earliest occupation at this site. Some time after the first occupation a small amount of sand-tempered plain pottery was made. Type II blades also began to appear at this time. These traits apparently did not greatly modify the pattern of life. Dart points continued to increase in number. There are no significant changes in types of dart points or classes of artifacts in the levels from one to two feet below the surface (Zone III C). One arrow point came from a depth of 1.5 ft., but this could have been intrusive, as some evidence of soil disturbance by rodents was noted in the field. Apparently the nomadic hunting peoples adopted sand-tempered pottery and continued their pattern of existence with little other modification.

In the upper levels of the site (surface to 1 ft., zones III C and III D) a few arrow points and some decorated, clay- and bone-tempered, pottery appears. There are several possible explanations for the appearance of these cultural traits: the arrival of new groups of people in the vicinity with these traits already well developed; or a gradual diffusion of these traits into this area due to contact of the local population with other cultural centers. Dart points are still present in Zone III D, but they have greatly decreased in popularity. A few dart points of the Gary type are found in the upper levels, and this would seem to indicate that they came into the area at about the same time as the bow and arrow and clay-tempered pottery. Gary points are found throughout the southeastern United States.

E. E. RUNNELLS No. 1 (41-42D5-5)

This site is located about three hundred yards west of E. E. Runnells No. 2 on a low sandy ridge (Fig. 1). The site is rectanguloid in outline and approximately 500 feet long (north-south axis) and 150 feet wide. The ridge was planted in corn at the time of excavation, and it was necessary to harvest the corn before test excavations could begin. The grid system (Fig. 11) was established with the base stake on the south central edge of the site, at an arbitrary elevation of one hundred feet. A five-foot wide test trench was excavated from NO–EO to N350–EO. The first level was from the surface to one foot and extended below the plow zone. Five-foot east-west test trenches were excavated from N50–EO to N50–E50, and from N100–EO to N100–E50, and to a depth of one foot. Five-foot square test pits at fifty yard intervals in the test trench were excavated in six-inch levels.

The stratigraphy varied considerably throughout the excavation. Two zones were recognized. Zone II is a tan sand and extends from the surface to depths ranging from ten inches to several feet. This zone is

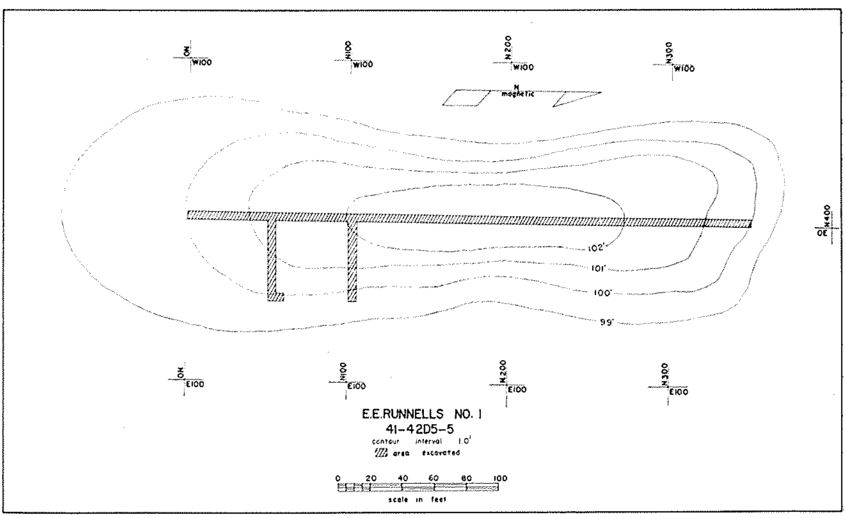

Fig. 11. Map of Runnells No. 1, showing area excavated.

macroscopically the same as Zone III of Runnells No. 2. Zone I is a mottled red-orange and blue clay, and apparently corresponds to the orange-blue clay (Zone I) of Runnells No. 2.

Zone II has three subdivisions: a tan, humus-stained sand, the plow zone (II C); a humus-stained tan sand zone (II B); and a clean, light, tan sandy zone (II A). Artifacts were found throughout Zone II. Zone I has two recognizable subdivisions: a red-orange clay zone containing much sand (I B); and below this a very compact mottled clay, red-orange and blue in color (I A). No artifacts were found in Zone I.

No trace of Zone I was found in five-foot test square N350–EO. Further testing showed that Zone I lenses out in this area and Zone II is underlain by a clean gray sterile sand. Little is known about this formation; and, as it is sterile and has no bearing on the archeology of the site, it will not be considered further in this paper.

Cultivation over a relatively long period of time has caused extensive water erosion of Zone II. Stratigraphy within this zone was of no archeological significance. The cultural remains recovered during excavation are very similar to those described for Runnells No. 2. For the most part they will only be listed by type or identifying number, but a few items are described separately.

Dart Points. Nineteen Type I dart points were found. Fifteen are made of buff-colored chert, three of gray silicified wood, and one of white quartzite. All of these points fall within the size range previously given for this type.

Five additional dart points are made of chert and have no diagnostic value. Four other points are made of petrified wood. One of these shows very fine workmanship on both faces. The blade is triangular with convex edges. One side of the point has a weakly developed shoulder, and the other bears no trace of a shoulder. This point has a contracting stem with a slightly convex base. Its dimensions (in centimeters) are: length 4.4, stem length 1.6, width at shoulder 2.2, thickness 0.7. The remainder of the dart points are either fragmentary or unclassifiable.

Arrow Points. Only seven arrow points were found at this site. One is of Alba type, one is Perdiz, and five are unclassifiable fragments. Three are made of petrified wood and four are made of chert.

Drills. One stone drill was uncovered by the test excavation. It is a Type II drill and is too fragmentary to be measured.

Scrapers. One plano-convex end-scraper (Type I) is made of chert. This is a fine specimen with a thick bit and convex scraping edge; its dimensions (in centimeters) are: length 3.1, width 1.9, thickness 1.0.

Two other scraping artifacts were found. One is a Type II scraper and the other is an unclassified form. Both are made of chert. Sizes are similar to those previously listed for comparable types.

Bifacially Flaked Blades. These form the largest class of lithic artifacts. Fifty-three of these are made of chert and petrified wood, with the latter material occurring more frequently. These blades are of the following types: Type I, 3; Type II, 10; Type III, 15; Type IV, 5; Type V, 4; and 16 miscellaneous blades. One of the miscellaneous blades is bifacially flaked, and apparently was made for hafting. It has a trianguloid blade with one straight edge and one concave edge; broad, shallow side notches; and a slightly concave base. Its dimensions (in centimeters) are: length 7.3, width 3.5, thickness 1.0.

Bannerstone. Only one polished stone artifact was found at this site. This is a bannerstone fragment made of a dark brown, very fine-grained hematite (Fig. 15, C). The entire fragment is highly polished. A hole of uniform diameter was drilled through the complete width of the stone. It is along this perforation that the bannerstone was broken. Only half of the artifact was recovered. Its measurable dimensions (in centimeters) are: width 4.5, length of central hole 4.5, thickness 1.7, diameter of central hole 1.0.

Hammerstones. Five large fragments of silicified wood have been roughly battered on both ends. The largest of these is 18.9 centimeters in length and the smallest is 7.0 centimeters.

Miscellaneous. Unaltered pigment stones, burned clay lumps, and miscellaneous stone chips were recovered also from the test excavation. These were widely scattered and appear to have no stratigraphic significance.

Discussion. The artifacts from Runnells No. 1 closely resemble those from Runnells No. 2 both in number and in types. This, as well as the close proximity of the two sites, leads to the conclusion that Runnells No. 1 experienced the same sequence of occupation as described for Runnells No. 2. A tabulation of the horizontal and vertical distribution of artifacts at this site was of little value because the deposits were extensively disturbed by cultivation and subsequent erosion.

SAWMILL SITE (41-42D5-9)

This was by far the most productive site tested during the field season. It is located on a low sandy ridge overlooking the Angelina River flood plain (Fig. 1). Extensive testing (Fig. 12) was carried out during much of October and November. Excavations produced evidence of occupation of this site at various times from the Archaic stage up to historic times. Relatively recent cultural modifications of the ridge top include cultivation, a deep, narrow road-cut no longer in use, and an abandoned sawmill which accumulated a very large mound of sawdust during the years of its operation.

The exact area covered by this site was not accurately determined. It apparently covered most of the elevated area in this vicinity and may have extended out onto the flood plain at times. The deep central midden, which was extensively tested, is approximately two hundred feet in diameter. At one time a county road was cut across the center of the site and removed a section of the midden about twenty feet wide. Human burials were reported to have been found along this road-cut in the past, but none of the skeletal material could be located.

Artifacts from test excavation of this site number about 12,000. Because of time limitations it was not possible to describe and analyze all of this material. A section was selected from the center of the concentrated midden, and an analysis of the material of this section was made (Figs. 13 and 14). For purposes of this paper, all of the potsherds from this section have been considered as a single group. A complete and detailed analysis of this pottery will be made by Mr. Jelks in his forthcoming report.

Stratigraphy was relatively well defined at this site. Cultural material was recovered by arbitrary six-inch levels and separated according to the geologic zones. The basal deposit (Zone I) consists of yellow to reddish sandy clay and contained no cultural remains. Several deep test holes in the test trenches and in the road-cut did not reveal any change in this deposit. Zone II is a sandy member immediately overlying Zone I. A tan unstained sand (II A) comprises the bottom portion of this zone. The upper part (II B) of this zone is humus-stained and apparently represents an old stabilized surface with a well-developed soil surface. A few flakes of stone and an occasional artifact indicate that the first occupation occurred on this old surface. This zone is now buried beneath sandy deposits up to four feet thick. The origin of these overlying deposits is uncertain.

A clean unconformity separates the surface of layer II B from the overlying Zone III. Zone III is a sand member several feet thick which covers the top of the ridge. Cultural material occurs throughout this zone, which is divided into three parts. Layer III A is an organically stained sand of varying thickness. This layer produced numerous lithic artifacts but very few potsherds. Zone III B is a dark humus-stained sand containing much cultural material. Layer III C is the plow zone

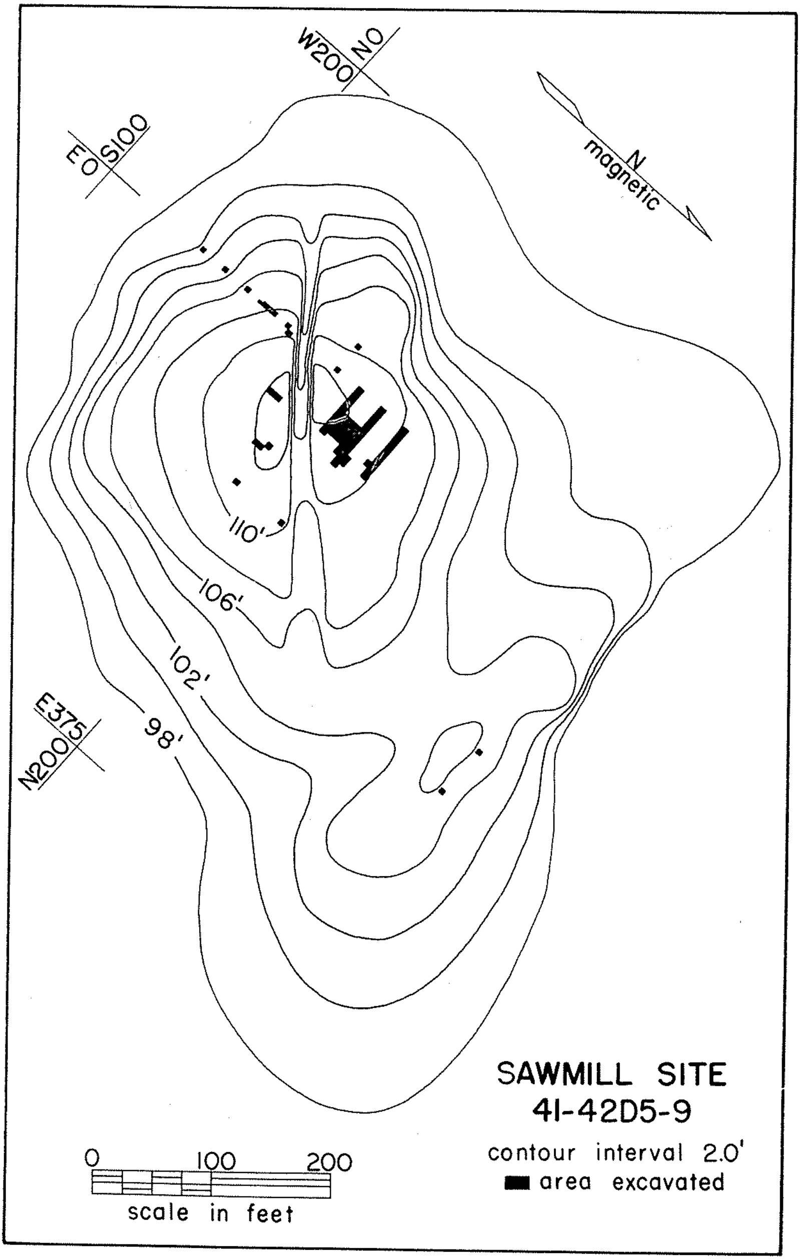

Fig. 12. Map of Sawmill site, showing area excavated.

and is comprised of dark humus-stained sand usually indistinguishable from Zone III B when both are dry. Potsherds occur in great quantity in layers III B and III C. In several instances disturbance of natural stratigraphy was detected in the form of pits and rodent runs.

The lithic artifacts from the deep test area of this site are described according to class and type. Distributions of the dominant types are tabulated according to both arbitrary depth and to geologic zone (Figs. 13 and 14). Pottery distribution was computed considering all sherds as one group. Observations in the field indicate that the sand-tempered pottery appears considerably earlier than other types. This will be clarified in the final report on this site.

Dart Points. A total of 143 dart points was recovered from the concentrated midden area. Ninety-seven of these are Type I dart points (Fig. 2, I-L). In this large sample certain small variations are apparent. This group was divided into four subtypes according to stem shape. This was done primarily to emphasize the variation of stem shape within this type. The distribution of each subtype is almost identical (Fig. 13).

Subtype IA is represented by 24 points with poorly developed barbs and broad, expanding stems. Bases are straight or convex. Thirty-five points (IB) have well-developed shoulders or slight barbs and moderately expanding stems with straight or convex bases. Twenty-three points make up subtype IC. These points have well developed L-shaped shoulders and slightly expanding stems, with straight to slightly convex bases. Fifteen points are of Subtype ID. These points have right-angular shoulders, rectangular stems with parallel sides, and straight or slightly concave or convex bases.

All of the above listed Type I dart points are made of silicified wood or of chert. This group of 97 points falls within the size range previously listed for the type.

Five projectile points are of the Gary type (Suhm, Krieger, and Jelks, 1954: 430). Three are made of chert and two of petrified wood (Fig. 3, B). The vertical distribution of the Gary points is shown in Fig. 13.

There are 41 miscellaneous dart points. Two of these are triangular non-stemmed varities. One (made of chert) has a concave base, straight edges, and is too fragmentary to measure; the other (made of silicified wood) has slightly convex edges and a straight base; its measurements in centimeters are: length 2.6, width 2.1, thickness 0.8.

One heavy chert point was shaped by the removal of large flakes. It has convex edges, large side notches, and a bulbous stem with convex base; its dimensions in centimeters are: length 4.8, stem length 3.0, width 2.0, thickness 1.0.

Twenty-one of the miscellaneous dart points are crudely fashioned stemmed varieties of no recognizable type. Blades are triangular to parallel-sided; edges are concave, straight, or convex; shoulders are poorly developed; stems vary from expanding to contracting, but none

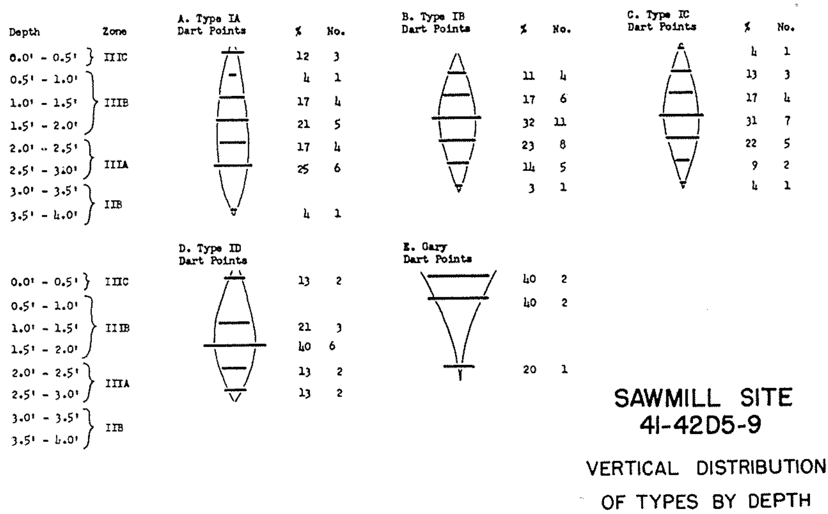

Fig. 13. Distribution of dart points (Type I and Gray) from Sawmill site.

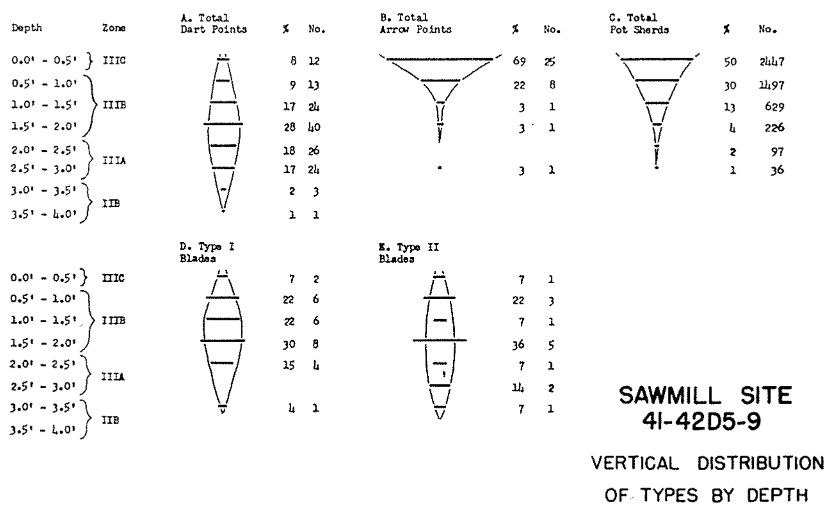

Fig. 14. Distribution of artifacts from Sawmill site.

is well shaped; and bases are concave or convex. Eleven points in this group are made of silicified wood, nine of chert, and one of gray quartzite. The average dimensions (in centimeters) of this group are: length 4.5, stem length 0.9, width 2.2, thickness 1.0.

Fifteen projectile point fragments are unclassifiable. The material and workmanship of these fragments indicate that they probably represent types similar to those described above. For the purposes of tabulation, these points are considered with the miscellaneous group.

The last two dart points (Type III) in the miscellaneous group are small side-notched varieties. The blades are triangular with one edge concave and the other convex. The concave edge on each specimen is steeply beveled. Small side notches form a broad expanding stem with concave base. The stem is wider than the blade on each specimen. The stem and base of these artifacts resemble the Frio type of dart point (Suhm, Krieger, and Jelks, 1954: 428), and they are possibly reworked points of this type. These artifacts also resemble Albany Beveled Spokeshaves (Webb, 1948: 132). However, in this report these artifacts will be tabulated as Type III dart points. One is made of chert and the other of silicified wood.

Arrow Points. Thirty-six arrow points and arrow point fragments were recovered from the concentrated midden area. Ten of this number are of the Perdiz Type (Fig. 4, G-K), and their distribution is as follows: Six points came from Zone III C, surface to 0.5 ft.; three from Zone III C–III B (mixed), 0.5 to 1 ft.; and the last came from Zone III B–III A (mixed), 2 to 2.5 ft. This last Perdiz point may be intrusive at that depth, because several rodent burrows were noted in the test square.

There are fourteen points of the Alba type (Fig. 4, D-F). These points were recovered from the following zones: Seven from Zone III C, surface to 0.5 ft.; five from Zone III C–III B (mixed), 0.5 to 1 ft.; one from Zone III B, 1 to 1.5 ft.; and one from Zone III B, 1.5 to 2 ft.

Three Cliffton points (Suhm, Krieger, and Jelks, 1954: 496) made of dark red chert were found in Zone III C, surface to 0.5 ft. These three points are roughly triangular and crudely chipped. The blades have convex edges, and the shoulders are very poorly developed. The stems are very short and convex. All three specimens are fragmentary and accurate measurements cannot be taken.

One point (Fig. 4, O) strongly resembles the Cuney type (Suhm, Krieger, and Jelks, 1954: 498). It is made of a fine-grained silicified wood and was located in Zone III C–III B (mixed), 0.5 to 1 ft.

Eight fragmentary arrow points cannot be classified. Seven are made of buff to dark brown chert, and one is made of light gray quartzite. Five show traces of a stem; the others are distal fragments. All of these arrow point fragments came from the upper one foot of the test excavation.

Drills. Only three artifacts can be classified as stone drills. These Type I drills were recovered from Zone III C, surface to 0.5 ft.

Scrapers. Nine scraping artifacts (Type II) were found within the concentrated midden area of this site. These are all made of buff-colored chert. All are thin flakes with small, convex, pressure-retouched scraping edges. They were scattered throughout the excavation.

Bifacially Flaked Blades. A total of 83 blades forms the largest class of lithic artifacts. There are 27 Type I blades (Fig. 5, E, G-H), all made of thin slabs of silicified wood. Fourteen blades, all made of the same material, are of Type II. The vertical distribution of these Type I and Type II blades is shown in Fig. 14. Eleven small bifacial blades (cf. Fig. 6, A-C) conform to the description and sizes listed for blade Type III. The remaining 31 blades are all bifacially chipped, and are of various sizes and shapes. The majority of these are made of gray or brown petrified wood. They range from 4 to 8 cm. in length. Most of these miscellaneous blades were shaped by the removal of large flakes by the percussion method. A few specimens show secondary pressure retouching along one or more edges.

Polished Stone Celts. Nineteen ground and polished stone artifacts were found in the concentrated midden area. Two of these are small polished stone celts (Fig. 15, A-B). The smaller of the two (A) is made of a dark, fine-grained "greenstone" pebble. The poll end of the pebble is unaltered, and the other end has been ground down to form a wide, sharp, well-polished cutting edge. The poll shows signs of battering. This celt is circular in cross section. Its dimensions (in centimeters) are: length 5.9, width 3.1, thickness 2.5.

The larger celt (B) is made of fine-grained, very dark brown hematite. It is oval in cross-section. The entire surface has been ground and well polished. In outline the lateral edges are slightly convex. The poll is rounded and the bit is slightly convex. It has a length of 7.4 cm., a width of 3.2 cm., and a thickness of 1.6 cm.

A small celt fragment is made of unidentified greenstone. This is a fragment of the bit end, 3.7 cm. in length and 2 cm. in width.

The larger celt was found in Zone III C, surface to 0.5 ft.; the small celt and the fragment both came from Zone III C–III B (mixed), 0.5 ft. to 1 ft.

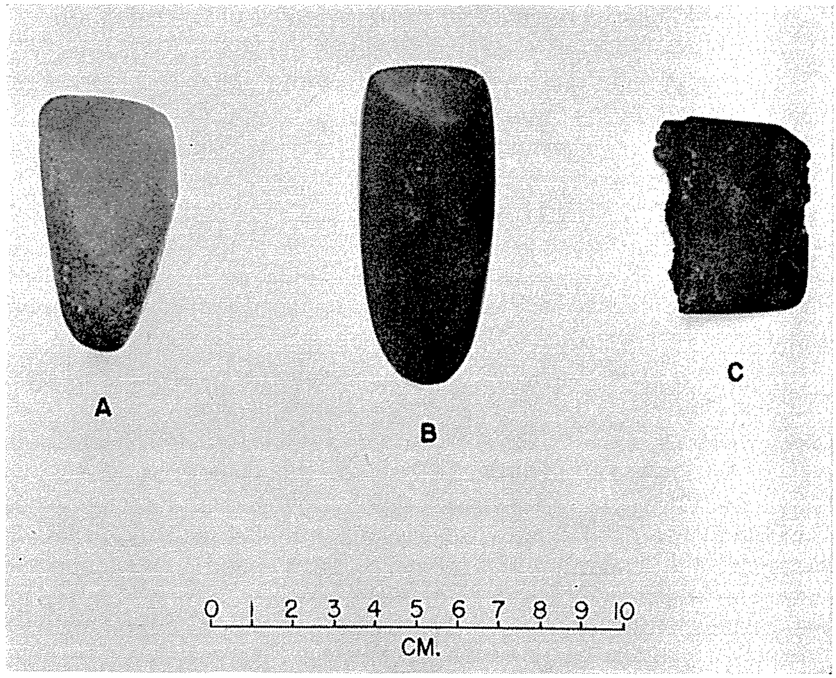

Fig. 15. Ground stone artifacts. Celts, A-B; bannerstone fragment, C. From Sawmill site, A-B; from Runnells No. 1, C.

Abrading Stone. A small fragment of light brown coarse-grained sandstone has a shallow groove along one side. This artifact was possibly used for sharpening points of bone, stone, or wooden tools, or perhaps as an arrow-shaft straightener. It came from a depth of 1.5 ft. below the surface. Its dimensions (in centimeters) are: length 5.0, width of groove 1.1, thickness 2.8, depth of groove about 0.2.

Pitted Stones. Seven of these (Fig. 7, A-C) were found during the excavation of the concentrated midden area.

Hammerstones. Only three recognizable hammerstones were found. One of these is a small chert river pebble, another is a pebble of milk quartz, and the third is a long fragment of silicified wood. All three show extensive battering on several edges.

Miscellaneous Ground Stone Artifacts. The eight remaining ground stone artifacts are of no diagnostic value. They are of various shapes and sizes, and all of them show evidence of grinding on one or more sides. One is light tan quartzite, one is light gray sandstone, and six are of dark brown hematite. The smallest has a maximum diameter of 3.7 cm., the largest a maximum diameter of 8.2 cm.

Pigment and Clay Objects. Numerous small fragments of red and orange pigment stone were found throughout the excavation. The average diameter is about 3.5 cm. Several small (up to 4 cm.) fragments of clay daub were found scattered throughout the concentrated midden area. A few of these show vague wattle impressions.

Stone Chips. As would be expected in a rich midden, each level excavated yielded a large quantity of stone chips. These were primarily chert and silicified wood. Most of the stone chips were discarded in the field, after careful examination. One hundred and sixty-six of these stone fragments were collected and catalogued. Analysis of their stratigraphic distribution yielded no useful data.

Pottery. A tabulation of the vertical distribution of sand-tempered sherds as opposed to clay- and bone-tempered sherds, produced the results shown in Fig. 16. This shows that the percentage of sand-tempered sherds is relatively high in the levels between two and three feet deep, but the percentage is much smaller in the upper levels. This appears to support the results of a similar analysis at Runnells No. 2. Considering the small number of sherds found below two feet at Sawmill Site, these results are not very conclusive. Numerous potsherds were found in the upper two feet of the midden, and soil disturbance by rodents could account for small numbers of sherds in the levels

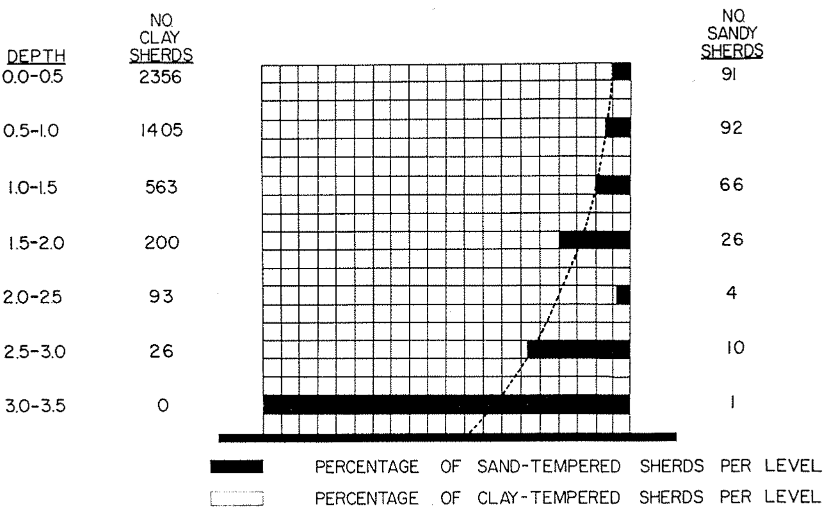

Fig. 16. Distribution of potsherds from Sawmill site.

immediately below. The significance of the vertical distribution of pottery types will be covered by Mr. Jelks in his report on this site.

Discussion. The Sawmill Site has produced evidence of a series of occupations. There is no separation of cultural levels by unconformities or sterile members, but a tabulation of artifact types by depth gives some interesting percentages (Figs. 13 and 14). These figures are based on a relatively large sample of artifacts. There is little evidence of a completely non-ceramic occupation of this site. No pottery was found below three feet (Zone II B), but the following lithic artifacts do occur below that depth: three Type I dart points; one unclassifiable dart point; one Type I blade; one Type II blade; and a small number of stone chips. This material is too meager for any positive conclusions. It can only be speculated that this ridge was briefly visited by people who did not make pottery.

Above the unconformity separating zones III A from II B cultural material appears in greater quantity. From two to three feet in depth (zone III A) artifacts are as follows: 90 potsherds (mostly sand-tempered plain); 34 Type I dart points; 15 miscellaneous dart points; 4 Type I blades; 3 Type II blades; 13 miscellaneous blades; 4 pitted stones; and one Perdiz arrow point. The arrow point seems to be intrusive into this zone from the upper levels. This artifact assemblage reflects a culture based primarily on hunting. Type I dart points were predominant at this time. The atlatl was probably used in connection with these dart points. A dependence on gathering is suggested by the pitted stone artifacts found at this level. The distinctive Type I and Type II blades were in use by this time, and the local peoples had begun to use the sand-tempered plain pottery, and perhaps some of the clay-tempered wares as well.

From two feet in depth to the surface (Zones III B and III C) there is a steady increase in the amount and types of pottery in use. Arrow points appear in the upper part of Zone III B along with various types of clay-tempered and bone-tempered pottery, as well as Gary Type dart points. Type I dart points and Type I and II blades continue to be used in all levels, but these types greatly decrease in popularity in the upper part of Zone III B and in Zone III C (Figs. 13 and 14).

The Sawmill Site was occupied mainly after the appearance of sand-tempered pottery and the associated blade types. The most extensive occupation of this site came, in more recent times, after the appearance of the bow and arrow and various types of pottery. It is significant, however, that the early traits continue in diminishing quantity throughout the midden.

Summary and Conclusions

An archeological survey of the McGee Bend Reservoir was conducted in 1948, and approximately 90 sites were located and classified. Extensive test excavations were conducted at several of these sites during 1956 and 1957 by the National Park Service (River Basin Surveys). During the course of these excavations it was noted that the lower levels in several of the sites seemed to produce cultural remains of a pre-ceramic occupation. Runnells No. 1, Runnells No. 2, and the Sawmill Site were selected for study to differentiate between the late Archaic horizon and more recent occupations. This task was complicated by the fact that there is no clear-cut stratigraphic separation of the geologic zones at any of the sites. It was determined that certain distinctive artifact types occur at all three sites and that the quantity of these types varies according to depth (see Table 1). Statistical distribution studies were made, and these produced evidence which can be used as a basis for the following general conclusions,

There was a late Archaic occupation at all three of these sites. This occupation is characterized by rather crude dart points with parallel-sided or expanding stems, shaped by percussion, and made from local stones (dart point Type I). A distinctive type of blade was commonly manufactured from a thin slab of silicified wood, and this shows fine pressure retouching along one edge (blade Type I). A few other scraping and cutting artifacts are associated with this occupation in small numbers.

The Type I dart points, which occur in large numbers at these sites, are very similar to those described as provisional types 6 and 8 (Wheat, 1953: 199) at Addicks Basin, about 125 miles to the southwest. A sand-tempered plain pottery is also present at Addicks basin. These two traits seem to indicate definite cultural ties between these areas. Ford and Webb (1956: 62) also illustrate dart points (Kent type) from the Poverty Point Site in northeastern Louisiana that are very similar to Type I dart points. This indicates an extension of this type over a wide area from the Texas Gulf coast to northern Louisiana (and perhaps much farther) in late Archaic and early ceramic times.

To the basic late Archaic culture at McGee Bend a sand-tempered plain pottery was added. This was accompanied by a new type of blade with an unworked base (blade Type II), pitted stones, and other miscellaneous lithic artifacts. These elements all increased in popularity for a while, but declined in numbers when, in more recent time, clay-tempered pottery, bone-tempered pottery, and arrow points appeared.

TABLE 1

Distribution of Artifact Types by Site

Artifacts	Type I	41-42D5-4 II	41-42D5-5 III	41-42D5-9 IV
Dart Point	I	34	19	97
	II	1		
	III			2
	Ellis	1		
	Ensor	1		
	Gary	5		5
	Pogo	1		
	Misc.	28	9	56
Arrow Point	Alba	3	1	14
	Cliffton			3
	Cuney			1
	Perdiz		1	10
	Scallorn	1		
	Misc.	1	5	8
Drills	I	7		3
	II	3		
Scrapers	I	1	1	
	II	6	1	
	III	2		
	Misc.	2		9
Blades	I	9	3	27
	II	21	10	14
	III	28	15	11
	IV	5	5	
	V	13	4	
	Misc.	36	16	31
Gravers		2		
Ground/Polished			1	13
Hammerstones		10	5	3
Pottery	Sand Temp.	63		290
	Clay Temp.	7		4642
	Total	70	174	4932
Pigment		15	1	31
Wattle		14		39

The totals in columns II and IV do not represent the entire excavations, but only the areas used for distribution studies.

The totals in column III represent the entire excavation at that site.

These latter traits probably entered the McGee Bend area from other cultural centers by a slow process of diffusion.

The E. E. Runnells sites seem to have been occupied more extensively in late Archaic times than the Sawmill site. Most of the cultural material from these two sites is assignable to the late Archaic and early ceramic horizons (Type I dart points, Type I and II blades, and sand-tempered pottery), although a small amount of later material (arrow points, clay- and bone-tempered pottery) appears in the upper levels of these sites.

The Sawmill site was occupied principally after the appearance of sand-tempered pottery and its associated lithic artifacts. The most extensive occupation of this site occurred after the appearance of the bow and arrow and various clay-tempered and bone-tempered types of pottery.

In my opinion, the appearance of sand-tempered pottery, Type II blades, and a general increase in the number of lithic artifacts, marks the end of the Archaic stage in the McGee Bend area.

It should be realized that the conclusions drawn in this paper are based on test excavations at only three sites, and at the present time there is very little published information on comparable material. It is hoped that future excavations at McGee Bend and in the surrounding areas will give a more complete picture of the archeology of this section, and of the Archaic stage in particular.

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The Development of the Atlatl and the Bow

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Someone has said that in our study of primitive man we should be more concerned with what he did than with what he might have done. Nevertheless, by placing ourselves mentally in his environment and reproducing, as far as possible, his lines of thought we can gain a fairly close insight into how he reacted to any particular situation. Thus, should some archeologist of the distant future recover a complete pick and shovel from the ruins of one of our cities, it would not be very difficult for him, by using a little imagination and having some knowledge of our times, to figure out almost exactly how those implements were used. In so doing, he will only be repeating what the archeologist of the present is trying to do with the tools, weapons, and household utensils of the prehistoric people. Thus, a similar study of the evolution of the atlatl and spear and the bow and arrow should come very close to the actual way the development of these weapons took place.

After the club and the thrown stone, man's next discovery in weapons was probably the spear. It took only a little experience to show him that a long, slender club pitched lengthwise was more accurate and gave a harder blow than the thrown stone, and with a sharpened point it was a still more deadly missile.

For a long time the spear was supreme. It gave a deadly certainty of attack and at the same time allowed a few feet of distance from the enemy or the quarry. However, the force that can be applied to the thrown spear by the unaided arm is very limited and man must have long felt the need of some way of giving it a greater velocity. This came with the discovery of the atlatl or throwing stick.

The exact way the idea came into being, we will never know. It may have been the result of seeing a child throw a gob of mud from the end of a stick or a green fruit from a limber twig. Whatever it was, it gave some observant savage the idea of hooking the end of a short stick over the end of his spear. With a little practice, he found he could throw much harder and about as accurately as by hand. From that time, it began to come into general use and continued until displaced by the invention of the bow.

The atlatl is still used by the Eskimos and the Australians and there is evidence that it was formerly in general use throughout much of North and South America. Yet the belief appears to be quite common that the propulsion of a spear by the use of the throwing stick is very difficult and that its mastery requires either a long period of practice or that the technique is so difficult that it is practically impossible for civilized man.

However, I once heard the explorer Stefansson say that a civilized man can do, in nine months, everything a savage can do and do it better. So with this statement in mind, I made a throwing stick about 16 inches long and cut a 5½-foot spear from a young willow. I sharpened the large end of the spear and made a cup-like depression in the small end to receive the atlatl head. The atlatl was a pine stick about an inch square with a shingle nail driven at an angle in the upper end.

The first attempts at throwing were disappointing. The spear was inclined to go sidewise and would probably have missed a cow at ten feet. But a few minutes practice gave the knack of balancing the spear so as to direct the energy of the drive along its longitudinal axis and it was soon possible to hit a bale of hay nearly every time at 15 or 20 feet. After practicing a few times, a target a foot in diameter could be pierced at 20 to 30 feet about four out of five times. From this it is easy to see how the atlatl-driven spear could become a very efficient weapon in the hands of a strong, active man.

My method of throwing is to use both hands, guiding the spear with the left and propelling it with the atlatl in the right. If the movement of the atlatl is carried too far forward and downward, it throws the butt of the spear down and it either goes sidewise or turns end for end. However, it does not take long to overcome this tendency and get the knack of driving the spear in a straight line.

If the spear is more than about three times as long as the atlatl, it is difficult to see how it could be controlled except with two hands. The Eskimos are described as throwing with one hand from a canoe. With a short, light spear only two or three times as long as the atlatl, I found it possible to throw quite accurately with one hand by giving the weapon a slight upward toss just as the throw is made.

Thus it seems that in the hands of primitive man who used the throwing stick almost constantly, the atlatl and spear were probably quite accurate and efficient.

Although not all tribes adopted the use of the atlatl, those who did probably continued its use until it was displaced by the invention of the bow. It was very efficient under certain conditions, but it has a number of serious limitations. It is quite evident that the bow is much superior when shooting at an object in a tree or on the side of a cliff. Also, arrows are more accurate and, although lighter, they have two or three times the effective range of a spear. While it was possible to carry only two or three short spears, 20 or 30 arrows can easily be carried in a quiver. Also, the bow can be used with less effort than the spear and can be shot with less body exposure.

Whether the bow originated as a primitive harp of one string, as our musical friends insist, or as a toy resulting from tying a string to the two ends of a bent twig, will never be known. The discovery of the bow was simple but its development into an efficient weapon was difficult and took a long time. The first real advance was probably the discovery that it might be used to throw a light spear with considerable force and accuracy.

Fortunately, dart points 3 or 4 inches long and weighing 1½ to 2 ounces were already in use. To give accuracy to an unfeathered small spear or arrow, it is necessary to use a fairly heavy head and these small spear points were just about the right weight for the purpose.

Experiments have shown that for the greatest accuracy the center of gravity in an arrow should be from ⅔ to ¾ the distance of the length of the arrow from its nock.[1] This is because a featherless arrow is mainly guided by the pressure of the air against the side of the shaft. So the farther forward the center of gravity, the greater the guiding force. However, if the center of gravity is very much more than ¾ the length of the shaft from the nock, the weight of the point becomes so great that the increased trajectory interferes with accuracy.

Usually, arrows are from 2 to 3 feet long and five-sixteenths to three-eighths of an inch in diameter. It can be shown by either calculation or experiment that they can be properly balanced by points from one to two ounces in weight. It happens that stone points from 3 to 4½ inches long and of the usual proportions are of about this weight and so work well on a featherless shaft. Thus it seems logical to think that they were so used on the first arrows. There are even tribes today who do not feather their shafts but depend on the weight of the head for accuracy.

[1] Evans, O. F., 1957. "Probable Use of Stone Projectile Points," *American Antiquity*, Vol. 23, No. 1, p. 83.

Later, when some ingenious savage hit on the device of attaching feathers to the side of the shaft, it was found that lighter arrow heads would give just as true a flight, as good penetration, and a flatter trajectory than the larger ones. This discovery of the use of feathers was a big step in advance. It probably compares in archery with the discovery of the use of the patched bullet in firearms.

In the light of the above, I suggest that our classification of projectile points could well be changed. I believe it is now usual to consider points up to 1½ inches long as arrow points and all above that as dart or spear points. Perhaps, considering their probable use, it would be more logical to consider points up to 2 inches in length as arrow points, from 2 to 4½ inches as either arrow or dart points, and above 4½ inches as primarily spear points.

Although the weight of the arrow point is of importance in determining the accuracy of unfeathered shafts, it is of small importance in the dart because of the greater weight of the dart shaft. With the dart and spear the accuracy of flight is somewhat more under the control of the arm muscles than is the flight of the arrow. Also, with the early darts the distribution of weight in the shaft may have been almost automatic, as the shaft was nearly always taken from the body of a shrub or small tree and the thicker part used as the forward end, thus throwing the center of gravity forward so that the weight of the stone point contributed only a little to the balance of the shaft.

In my experiments with the atlatl I found that placing vanes near the butt end of the shaft added to its accuracy. I do not know whether primitive man did this or not. I have seen pictures of African natives with masses of cotton or wool attached to their spear handles, but whether this was for use or decoration, I do not know.

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An Analysis of Archaic Material from Three Areas of North America

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IN RECENT years there has been a great deal of interest in the problem of the Archaic Stage as a continent-wide manifestation in North America. There has been much concern with the relationship of the western Desert Culture to the Archaic complexes of the eastern United States, and the place of Texas in the Archaic scheme of things. In regard to this last problem, when Jennings and Norbeck (1955) first defined the Desert Culture they included the western part of Texas within the geographical distribution of their early culture. The acceptance of early southwest Texas foci as part of the Desert Culture has, in fact, been widespread.

As an outgrowth of research for a report on the Pecos River Focus, I became involved in a continent-wide study of the Archaic Stage in North America and northern Mexico. Several matters became evident during the course of this study, some of them substantiating certain existing theories about Archaic cultures and others presenting arguments against other theories which are currently popular. Since the study is to appear shortly, I shall not go into detail, but will only summarize certain conclusions:

1. There is indeed ample evidence of an underlying pattern of culture throughout North America on what is usually called the Archaic level. However, the simple term "Archaic" has been used in so many different contexts that it has become too indefinite a term to be fruitfully applied. I have found it well to differentiate between a "proto-Archaic" and a later "Full Archaic." I use the term "proto-Archaic" to denote an early stage, between 8000 and 4000 B.C., in which a degree of homogeneity existed throughout North America.

2. Within the succeeding "Full Archaic" stage there may have been at least three areas of regional differentiation: the Great Basin and areas geographically peripheral to it; a southern area known principally from Trans-Pecos Texas but undoubtedly including northern Mexico as well;

and the Eastern Woodlands area. The study has presented evidence which differentiates these areas by an estimated date of 3000 B.C.

3. Artifacts common to both the western and eastern United States are due to the early homogeneous culture, or proto-Archaic, and not to the later Full Archaic stage.

4. Texas does indeed serve as a link between eastern Woodlands Archaic and western Desert Culture, but nevertheless displays a unity of its own and should not be considered as marginal to either one or the other.

The study to be reported in the present paper was made in an attempt to see how similar or dissimilar the areas in question are to one another. The method used was to compare the artifacts from type sites selected for each area. Danger Cave in Utah was selected as the type site for the Desert Culture (Jennings, 1957). For the western edge of the Eastern Woodlands, data were combined from sites D1EvIII, D1CaI, and D1McVIII in the Grove Focus of northeastern Oklahoma (Baerreis, 1951). For Texas, two points of reference were used: a group of Pecos River Focus sites in the southwestern part of the state, and a group of sites in Williamson County, central Texas, typical of the Edwards Plateau Aspect (Schuetz, 1956, 1957b). For the Southeast, my observations are based on Webb's Indian Knoll report of the Green River culture of Kentucky (Webb, 1946).

A few observations are in order concerning the material from these type sites. First, after doing the research for this paper I had an opportunity to observe personally the material from Danger Cave. I found the differences between the projectile points from Danger Cave and those from Texas to be so great that there should never be any confusion between the two groups. Out of the Utah material only about half a dozen points could be mixed with Texas points and pass unnoticed. It is necessary to stress the diminutive size of Danger Cave projectile points, which is not obvious in the written report. The small size of the projectile points also sets Danger Cave apart from other Great Basin sites. Clearly, I might have selected a more representative "type site" for the Desert Culture. Unfortunately, time has not permitted analysis of another site. I can only point out the drawbacks of using the Danger Cave material and ask the reader to bear them in mind.

The reason for using two type sites in Texas is simply explained. A close affinity between the Pecos River Focus and the Edwards Plateau Aspect has been demonstrated (Schuetz, manuscript to be published). The basic lithic inventory of the two areas is essentially the same. However, artifact percentages differ considerably and may eventually shed some light on possible patterns of diffusion. The differences are great enough so that neither group of sites can alone be considered typical of the Texas Archaic.

Comparisons with a type site in the Southeast, such as Indian Knoll which I have chosen, are beset with difficulties. In most of the southeastern site reports no attempt has been made to type the artifact series except in vague categories such as "side notched" or "corner notched" points. Few of the publications give actual specimen counts for the categories, being content instead with "frequent" or "rare" occurrences. I have therefore had to treat the Indian Knoll comparisons separately from those among the other sites.

Because of the factor of preservation, comparisons of perishable artifacts are limited to Danger Cave and the Pecos River Focus. Where Danger Cave lacked certain artifacts which have been found elsewhere in the Great Basin on the same time level, these other occurrences have been noted.

Comparing artifacts from one area with those of another in terms of typology and frequency is a chore beset with many pitfalls; it has to be done with caution. To begin with, only small segments of each culture can be compared over large areas because of the limited preservation of perishable material. This circumstance tends to distort one's view of the culture, throwing one segment—the imperishables—into the limelight and making this segment seem to be of primary importance. In addition, there are problems which the investigator must sometimes solve arbitrarily according to his own view of things. For example, a type described in one area may be described as several types in another area or by another worker, making comparisons difficult and often unreliable.

It is also difficult to equate time levels from one part of the country to another. I have attempted to compare only materials of similar age. A sequence of radiocarbon dates is known for Danger Cave, but we have only a single date for the Pecos River Focus, and two dates for the Green River cultures. However, the Level V date from Danger Cave and those from the other two areas correspond favorably. The relevant artifact types from Danger Cave are all present in Level V, although they all appeared as early as Levels II or III. Carbon-14 dates from Level II of Danger Cave are 7010 B.C. and 7839 B.C., and two dates from Level V are 2050 B.C. and 2950 B.C. (Jennings, 1957: 93). The one date available from the Pecos River Focus, from the next to top level at Eagle Cave, is 2600 B.C. (Schuetz, 1957a). The artifact types used in the present study were all present in this level. The

Green River culture of Kentucky (culturally the same as Indian Knoll) is dated at 2950 and 3350 B.C. (Libby, 1955, p. 94). A date is not available for the northeastern Oklahoma Grove Focus material, but this complex is a pre-ceramic focus in an area where pottery is known to appear in the late Archaic in at least one focus, the Fourche Maline.

Lithic Artifacts

Projectile Points

Many stone tools represent forms which have persisted from earlier levels than the levels under consideration here and are therefore of little value in trying to establish later relationships. For purposes of comparison here we will concern ourselves first of all with projectile point types.

Beginning with the Danger Cave series, I should explain that I have arrived at my percentages by comparing counts of individual categories with the total count of Jennings' W series through form W42. Beyond W42 I could not always be sure of the distinction between dart points and knives. Some of Jennings' categories have been grouped together where several forms of his series fall within the range of a single type in Texas. Such groupings have been explained in each case.

Danger Cave-Texas Archaic Comparisons. Four forms of Jennings' W series—W5, W10, W16, and W31—show similarities to the Pedernales type in Texas (for the Danger Cave forms see Fig. 1, top; for Texas types see Suhm *et al.*, 1954: 396 ff.). Pedernales blades are highly variable in form, but the type is distinct in its straight stem and deeply concave or indented base. Jennings' W5 form might be considered somewhat marginal to the Pedernales type, since the base is more concave than indented. W10 overlaps W5 in form, and one point illustrated in the Danger Cave report has the typical Pedernales indentation. Both W5 and W10 are carefully made with fine pressure retouching. Pedernales points vary from hastily made crude points to finely made specimens. W16 resembles the variant Pedernales points with slightly expanding stems. Stems of the W16 series also bear resemblances to the Uvalde and Frio points of Texas, but the long, slim blades are not characteristic of those two types. W31 points with indented bases are like the Pedernales type in outline but are described as having only one surface retouched, a technique not found on Pedernales points.

Jennings' W8 point form is similar to the Kinney point type of Texas in having a triangular or leaf-shaped blade with concave base. However, the W8 form has fine diagonal chipping, a technique not used on Kinney points. This difference in chipping sets the two forms apart, and I fail to see anything but a superficial resemblance between

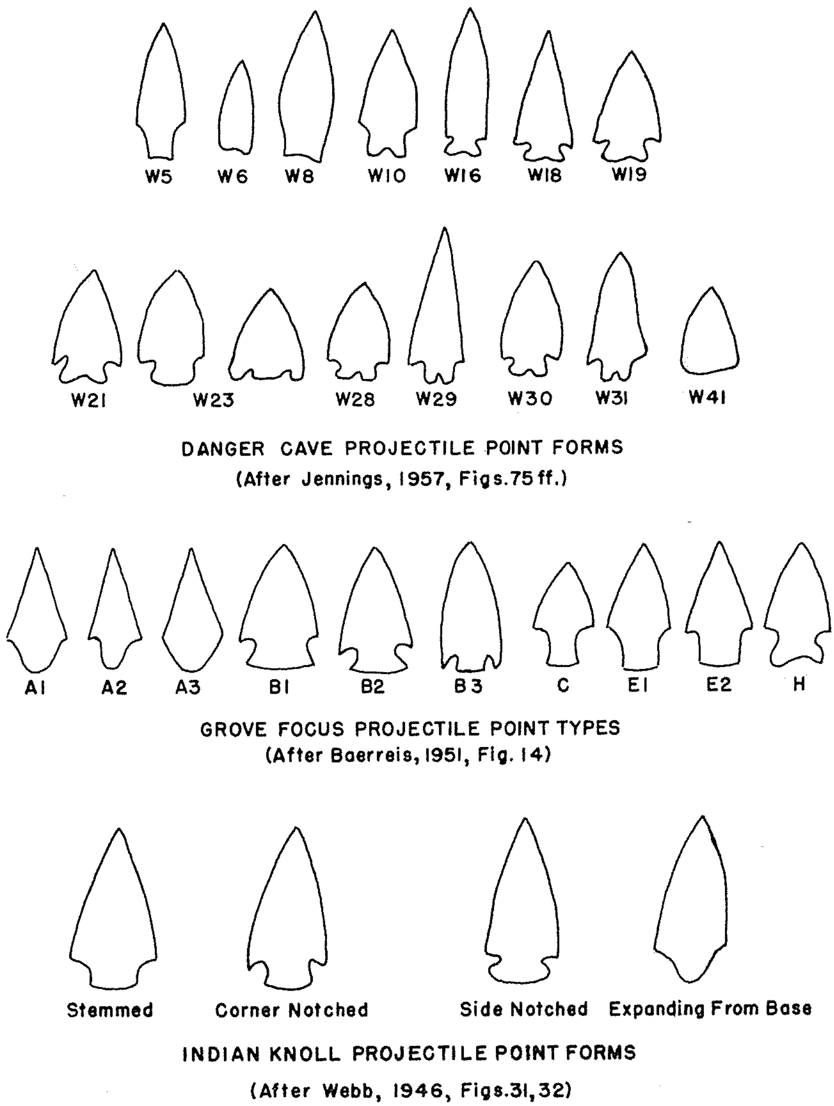

Fig. 1. Archaic projectile point styles.

them. Furthermore, both are found only as minor types: W8 points constitute 2 per cent of the projectile point total at Danger Cave, and Kinney points constitute 1 per cent of the total both in the Pecos River Focus and in the Williamson County material. For these reasons I have not included these two categories in the table of comparisons (Table 1).

The better-made examples of the W18 and W19 forms are similar to Marcos points. The three types can be described as triangular points with deep, narrow corner notches. However, bases of Marcos points are characteristically straight, whereas bases of the W18 and W19 forms may be more variable. An even more distinctive difference is the serrated blades of the W18 points. The W21 form overlaps W19, as noted by Jennings; the first W21 point illustrated (Jennings, 1957: 118, Fig. 92a, left) would fall somewhere within the Frio-Martindale categories in Texas. The others are like W19. The three forms—W18, W19, and W21—are grouped together in the table.

The W23 category is illustrated by two points in the Danger Cave report: one with a broad expanding stem which resembles the Castroville type, and one with a contracting stem and heavy barbs extending below the stem, which is like the Shumla point of the Pecos River Focus. Because this W23 form would fall into these two distinct types in Texas, and because it occurs in very small numbers, it is not used in Table 1.

W28 and W29 points are triangular with corner notches and small basal notches. They are very much like the Montell point in Texas.

W30 resembles the Frio point in Texas. Both types are triangular with fairly wide side notches and deeply recurved or indented bases, sometimes described as "eared." The W30 form differs from Frio points in being thick in cross-section.

W41 shows some overlapping with the Tortugas type. The points are unnotched and triangular in outline, with retouched bases and blades. However, Tortugas points are often beveled. The W41 form accounts for 3 per cent of the points at Danger Cave. The Tortugas type is of major importance only in southern Texas, and its frequency is less than 1 per cent in the Pecos River material and 1 per cent in the Williamson County sites of the Edwards Plateau. Because it is not typical of either the Pecos River Focus or the Edwards Plateau Aspect, it is not entered in Table 1.

Texas-Grove Focus Comparisons. Proceeding to comparisons of Texas types with those of northeastern Oklahoma, we shall see that ten types of dart points described by Baerreis from the Grove Focus

(Fig. 1, middle) have parallels in the Texas Archaic. Comparisons are limited by lack of information on techniques of manufacture in the Oklahoma series, so that we are dependent primarily upon outline drawings and data on size range.

Baerreis' A1 and A2 types are like the Gary type of Texas. These points have triangular blades and pointed or rounded contracting stems. The size range is about the same in Oklahoma and Texas. However, the Gary type is not characteristic of the Pecos River Focus or the Edwards Plateau Aspect, but rather is typical of the East Texas Archaic. It is unfortunate that we do not have a control site in east Texas with which to make more accurate artifact percentage comparisons, since the disparity between an 18 per cent incidence of the type in Oklahoma and a 1 per cent incidence in central Texas might assume a different significance if the east Texas data were brought into the picture. It is quite likely that the frequency of Gary points in east Texas is about the same as in northeastern Oklahoma.

Baerreis' type A3 shows similarities to the Desmuke type, but the limited distribution of the latter in southern Texas minimizes the possibility of a direct relationship. The size range of type A3 is much like that of types A1 and A2, and of Gary points, and type A3 might be considered as a variant of these three.

Type B1 shows similarities to the Ellis and Ensor categories of Texas. In outline, B1 seems more akin to the Ellis point, but its size range is almost double that of the latter. It bears some resemblance to the Ensor type, although the side notches of the latter tend to be smaller. The size ranges for the two are about the same. Ellis is a major type in eastern Texas, but I do not have a control site in that area, so that we are not able to make comparisons with an assemblage in which Ellis is a major type. Therefore B1 is compared with Ensor in Table 1.

The B2 points from the Grove Focus are similar to points of the Marcos type both in outline and in size range. B3 seems to be most similar to the Marshall type, which includes points with a heavy triangular blade and basal notches. B3 is also similar to the Castroville point, but the stem is too narrow in proportion to the blade to fit into that category.

Type C from the Grove Focus resembles the Lange point with its wide shoulders and slightly expanding straight-sided stem. However, Lange points have comparatively short stems in relation to blade length, whereas on type C points the stems constitute one-third the total length of the point. Such long stems are within the range of the

Lange type, but on the Lange points a stem about one-fifth the total length is more typical.

Baerreis' types E1 and E2 have rectangular stemmed points corresponding to the outline of the Bulverde type. Bulverde points are characterized by basal thinning of the stems, resulting in a wedge-shaped longitudinal section. Since we lack information as to the flaking techniques used on the E1 and E2 points, we can not tell whether the similarity of these points to Bulverde points is limited to the outline or not.

The points of type H in the Grove Focus seem related in outline to the Frio type, but there are evident differences. The H points have a smaller size range than Frio points. The blades of H points are occasionally beveled. More interesting is the frequent occurrence of ground bases and sides in the H series. This practice might be a survival from an earlier fluted-point, ground-base tradition. Several Texas Archaic point types show the same smoothing of the bases.

Discussion. When the significant point forms from these different areas are grouped according to appearance and their percentage frequencies in the different areas are compared (Table 1), some interesting matters for speculation become evident. We find that seven point forms are shared by the Oklahoma (Grove Focus) and Texas (Pecos River-Edwards Plateau) Archaic. Four forms are shared by Danger Cave and the Texas Archaic. Two forms are shared by all three.

Most intriguing are the high percentages of Pedernales and Montell points occurring in Danger Cave and the Edwards Plateau Aspect. If we ignore the size differences that distinguish points from the two areas, the Pedernales and Montell points constitute important types in both areas.

The contrast between the high percentages of the A1, A2, and B1 series in the Grove Focus and their infrequency in the Edwards Plateau sites is misleading. The A1 and A2 types are comparable to the Gary type, and the B1 type is probably most comparable to the Ellis type; and both Gary and Ellis points are characteristic of the East Texas Archaic rather than of the Edwards Plateau. Close analogies can probably be established when the Grove Focus material can be compared with material from the East Texas Archaic.

The high percentages of Marcos-like and Bulverde-like points in the Grove Focus give rise to the speculation that the origins of these two types lie north of Texas.

TABLE 1

Comparison of Projectile Point Frequencies

Texas type	Pedernales 15%	Montell 11%	Marcos 9%	Frio 4%	Gary	Ensor	Marshall	Lange	Bulverde
Danger Cave, Utah	(W5, W10, W16, W31)	(W28, W29)	(W18, W19, W21)	(W30)					
Pecos River Focus, Texas	1%	less than 1%	less than 1%	7%		20%	1%	1%	1%
Edwards Plateau Aspect, Texas	23%	7%	3%	1%	less than 1%	4%	6%	2%	3%
Grove Focus, Oklahoma			18% (B2)	1% (H)	18% (A1, A2)	18% (B1)	2% (B3)	4% (C)	16% (E1, E2)

Marcos-like points occur in high percentages at Danger Cave and in the Grove Focus, but the Marcos point is a minor trait in Texas sites. This distribution is puzzling in view of the fact that there seems to be a greater affinity, in terms of point type frequency, between Danger Cave and the Edwards Plateau than between Danger Cave and the Grove Focus.

Frio-like points are not very significant in the Grove Focus and the Edwards Plateau Aspect, but are prominent in the Pecos River Focus and moderately so at Danger Cave.

A consideration of the dominance of certain point types at each control site reveals some important differences. Predominant at Danger Cave are those points within the Pedernales range (W5, W10, W16, and W31) which account for 15 per cent of the projectile point total, the Montell-like points (W28 and W29) which account for 11 per cent, and the Marcos-like points (W18, W19, W21) with a total of 9 per cent. Other major point categories are: W26 with 8 per cent and no parallel in Texas; W37 with 7 per cent and no parallel in Texas; W30 with 4 per cent and a resemblance to the Frio type; and W6 and W9, each of which accounts for 4 per cent and is without a parallel in Texas. Of these last, W6 is described by Jennings (1957: 106) as "perhaps the most characteristic artifact from the sites." It is a lanceolate point with a deeply concave base, which would seem to owe its form and technique of manufacture to the fluted point tradition. This point has no parallel in Texas.

Major Pecos River Focus types are: Langtry, with a frequency of 21 per cent; Ensor, 20 per cent; Abasolo, 8 per cent; Frio, 7 per cent; and Shumla, 6 per cent. In addition there is a fair representation of Edwards Plateau Aspect types.

A shift in the dominant point types occurs in the Edwards Plateau Aspect of central Texas, major traits of Pecos River becoming minor and vice versa. The Pedernales point accounts for 23 per cent of the total count, Castroville for 18 per cent, Montell for 7 per cent, Marshall for 6 per cent, and Abasolo for 4 per cent.

In the Grove Focus of Oklahoma, the Gary-like A1 and A2 points account for 18 per cent of the total; the Ensor-Ellis-like B1 point for 18 per cent; the Marcos-like B2 point for 18 per cent, and the Bulverde-like E1 and E2 points for 16 per cent.

On the basis of the type parallels and percentage distributions presented here, we can conclude that the Archaic lithic complexes of Texas and Oklahoma are more closely linked than those of Texas and the Basin cultures. However, we can also tentatively point to possible links between Texas and the Basin area on the basis of such distinctive point forms as Pedernales and Montell and their western counterparts.

Texas-Grove Focus-Indian Knoll Comparisons. It is hard to find any great similarity in projectile point types between the Oklahoma-Texas series and those to the east. Webb has classified the Indian Knoll points into "stemmed," "corner notched," "side notched," and "expanding from base" forms (Fig. 1, bottom). Otherwise the varieties are not typed. The counts are given for "large" and "small" points, the dividing line being 6 cm., but these size categories cut across those based on stem forms. The "stemmed" form makes up 20 per cent of the total; "corner notched" constitutes a huge 52 per cent; "side notched" makes up 27 per cent; and "expanding from base" (contracting stem), which overlaps the Gary type, constitutes only 1 per cent.

The most impressive characteristic of these southeastern points is their large size. They immediately bring to mind the East Texas Pogo points which are regarded as possible spear points. The Pogo type of Texas is something of a catch-all, encompassing large stemmed points which display much variation in stem and blade form. The large blades at Indian Knoll account for 24 per cent of the total point count.

These comparisons suggest that the Gary-like form was developed somewhere in the East Texas-Oklahoma-Missouri region and was adopted as a minor addition to the eastern lithic complex, and also that the large stemmed blade tradition originated in the southeastern states and was adopted as a minor trait in Oklahoma and Texas.

What may prove significant in the final analysis are techniques of corner notching, side notching, and rectangular stemming of points, serving as criteria for regional differentiation. Major types in Texas, Oklahoma, and the southeastern states could all logically be defined in terms of variations of such simple ancestral traits.

Other Lithic Artifacts

There are four categories of Archaic lithic artifacts found in Texas and perhaps in Oklahoma, but which are apparently missing from the Danger Cave complex and perhaps from the Basin generally, and which are absent in the east. They seem to have developed within the period under consideration here, and may afford strong indications of links between Texas and the area immediately to the north. The distribution of these artifacts is imperfectly known, hence my qualification in assigning them to Oklahoma.

One artifact is the corner tang knife. Once thought to be restricted to Texas, in recent years it has been reported from virtually all the southern Plains states to the Rocky Mountain area and in northern Mexico.

A second category of artifact is the Clear Fork Gouge. The type has a distribution throughout central and southwestern Texas and has recently been described as having a distribution throughout the southern part of Oklahoma (Bell, 1957). Possibly the Clear Fork Gouge can be correlated with the Neosho scraper pictured by Baerreis (1951), thereby extending its distribution northward. It would appear to be developed from the very early plano-convex keeled scraper-plane which had a continent-wide distribution on a very early time horizon.

The third category is that of specialized knives which tend to double-pointed or lozenge-shaped forms with beveled cutting edges. They are found through central Texas with Archaic material. An example was reported by Baerreis from site D1CaI but is suspected of being intrusive from the later Neosho Focus.

A fourth artifact type is a hand axe fashioned from a cobble with part of the originally encrusted outer surface of the nodule retained for grasping. There is considerable variation in the finishing of the cutting edge, from a crude (probably hastily made) form to one of more finished appearance. The hand axe is consistently found in small numbers with typically Archaic material in central and southwestern Texas. I have no information concerning its distribution outside the state, but on the basis of other lithic artifacts common to both areas, we might logically expect to find it as a component of the Archaic complex of Oklahoma as well.

Perishable Artifacts

A comparison of the inventory of perishable artifacts of the Great Basin Desert Culture and that of the Pecos River Focus reveals many shared traits. It also reveals a great many differences worthy of further study when more material becomes available for analysis. The comparison is presented in Table 2; the matters of significance in connection with the comparison are summarized here.

1. Objects identified as arrow fragments were found in Level V of Danger Cave along with atlatl parts. The provenience of probable arrows from the Pecos River caves is as yet unknown and may represent a very late cultural deposit overlying Pecos River Focus Archaic.

2. The functions of the small bows found in both areas are unknown. Jennings suggested that his specimens might have been used as bow drills. The bows from the Pecos River sites may have been snare parts. All of these specimens, from both areas, could be toys.

3. The knife handles described from Danger Cave are quite unlike the Pecos River hafted blades. Only the trait of hafting knives is shared.

4. There seems to be a great difference in bone working between the two areas. L-shaped and splinter awls predominate at Danger Cave. Awls carefully fashioned of split metapodial bones predominate in the Pecos River Focus and seem to have a more finished appearance than the Danger Cave specimens.

TABLE 2

Comparison of Traits: Pecos River Focus and Danger Cave

	Pecos River	Danger Cave
WOOD		
Rabbit stick	x	
Pointed and grooved dart foreshaft	x	x
Double pointed foreshaft	x	x
Barbed foreshaft	x	
Tongue and groove foreshaft	x	x
Reed shafts	x	x
Atlatl	x	x
Arrows	x	x
Small bows	x	x
Y-snare and trap trigger		x
Hearths and drills	x	x
Scoops	x	x
Fire tongs	x	
Digging stick	x	?
Wedges	x	
Stakes	x	
Burred wood	x	x
Pins or pegs		x
Painted gaming sticks		x
Rasping stick	x	
Flageolets	?	
Cane cigarettes, cedar foliage	x	
Paint brushes	x	
Needles	?	?
Shuttle	x	
Atlatl nock for reed shaft	x	
Cradles	x	
Knife-scraper handles	x	x
Encircling-groove and breaking technique	x	x
BONE		
Awls	x	x
Flakers	x	
Antler wrenches	x	x
Antler hammer-rubber	x	?
Pins	?	
End scraper	x	
Scapula rattles	x	
Rasp	x	
Grooved needles } Netting needles }	x	
Beads	x	?
Bars of bone		x
"Shoe horn" (bull-roarer?)		x
Horn spoons		x
Tubes		x
Grooved tooth pendant		x
STONE (other than lithic material described in the text)		
Net sinkers	x	
Tubular pipes	x	
Slate pendants	x	x
Other stone pendants or beads	x	x
Single handed manos	x	x
Slab milling stones	x	x
Block milling stones		x
Abrading stones		x
Incised stones		x
Painted stones	x	
Pictographs	x	
Petroglyphs	x	
Red and yellow ocher	x	x
SHELL		
Mussel shell scrapers	x	x
Pendants	x	
Land snail shell beads	x	
Olivella shell beads	x	x

TABLE 2—Continued

Comparison of Traits: Pecos River Focus and Danger Cave

	Pecos River	Danger Cave
SKIN		
Sandals	x	
Moccasins		x
Blankets	x	
Apron	x	
CORDAGE		
Fiber cordage, Z twist	x	x
Fiber cordage, S twist	x	x
Fur string	x	x
Feather string	x	x
Hair string	x	
Carrying nets	x	x
Fish nets	x	
Gaming nets	x	?
Knotted netting	x	x
Coil-without foundation netting	x	
Apron	x	
CORDAGE SOURCES		
Juniperus (cedar)		x
Apocynum (Indian hemp)		x
Artemesia (common sage)		x
Asclepias (milkweed)		x
Cowania (cliff rose)		x
Linum (flax)	x	x
Salix (sandbar willow)		x
Scirpus (bulrush)		x
Stipa (needle grass)		x
Agave (Lechuguilla, Sisal)	x	
Dasylirion (Sotol)	x	
Yucca (yucca)	x	
Gossypium (cotton)	x	
TEXTILES		
Headbands	x	
Rattlesnake vertebrae necklace	x	
Bracelets	x	
Carrying chain	x	
Carrying "nooses"	x	
Fish stringers	x	
Fiber storage bundle	x	x
Simple twined basketry	x	x
Diagonal twined basketry	x	x
Twined openwork basketry	x	x
Twined wickerwork		x
Unique twined (see text)	x	
Checkerweave	x	
Twilled weave	x	
Interlocking coil stitch	x	x
Non-interlocking coil stitch		x
Coil: bundle foundation	x	
Coil: half-rod foundation	x	
Coil: one rod foundation		x
Coil: one rod and bundle		x
Coil: two rod horizontal		x
Coil: three rod bunched		x
Fuegian coil	x	
Unique openwork (see text)	x	
Decorated baskets: added elements		x
Over one-under one cloth		x
Basketry patches	x	
Sandals	x	
MISCELLANEOUS TRAITS		
Cement hafting	x	
Unfired clay objects without tempering	x	x
Grass lined basins		x
Burials within shelter	x	
Evidence of peyote and mescal cults	x	
Evidence of hunting cult	x	

5. Although bone flakers have not been described from Danger Cave, they were reported from Deadman Cave, Utah (Smith, 1941) and are probably components of the Desert Culture.

6. Two types of bone needles have been described from southwestern sites. Grooved needles, probably used for sewing, are known from both the Pecos River Focus and Deadman Cave (Smith, 1941) and may have been used extensively throughout the Basin area. The netting needles from the Pecos River Focus, together with the shuttle, are unique net-making implements.

7. The absence of net sinkers and fishing nets in Danger Cave is of no particular significance in distinguishing differences between the two areas.

Net sinkers were recovered from Leonard Rock Shelter, Nevada (Heizer, 1951). Fishing was practiced in the Desert Culture where conditions permitted.

8. String made of strips of duck skin was found in Danger Cave; the technique of manufacture is the same as the twisted-fur string from that site and is unlike that from the Pecos River Focus.

9. Gaming nets are used here to designate the very long stretched nets described in the Pecos River Focus. The only examples of netting pictured in Jennings' report are two drawstring bags which seem to be like the carrying nets described from the Pecos River Focus. Dimensions are not provided by Jennings and it is quite possible that large drawstring bags could have been used for trapping. Game nets were reported from the Leonard Rock Shelter (Heizer, 1951).

10. Although lint cotton in unspun fiber form is found at Shumla in the Pecos River area, there is as yet no evidence for its use as a textile source. It is listed in the table because of its presence at a presumed early period and because of the contact with Tamaulipas, Mexico, which its presence implies (MacNeish, 1958).

11. Modeled artifacts of unfired gray limey clay without intentional tempering are shared by both cultures. The forms differ completely, however. At least one Danger Cave specimen is an effigy. Others from the site are unidentifiable. The two specimens recovered from the Pecos River area are cigar-shaped.

From these comparisons we recognize first of all the divergent techniques of manufacture displayed in several industries.

The Pecos River Focus appears to have achieved a higher degree of specialization in bone working. Awls seem to be better finished in the Pecos River sites. Flakers are not reported from Danger Cave and the other Wendover sites but are found in the Pecos River sites in sufficient quantities to indicate their importance. Such highly specialized tools as netting needles have never been reported from the Basin area.

The textile industries reveal only superficial resemblances. Absent from Danger Cave and the other Wendover sites are the sandals, checkerweave and twilled mats, and headbands common to the Pecos River Focus. Twined basketry predominates at Danger Cave; coiled basketry predominates at Shumla, a Pecos River site. Though the interlocking stitch predominates in both cultures, the non-interlocking stitch runs a fairly close second at Danger Cave and is not represented at Shumla. Further, coiled work foundations are completely different in the two areas. Three unique basket weaves have been noted from the Shumla material. A unique sample of wickerwork was recovered from Danger Cave. Just what these unique basket weaves mean is impossible to tell at present. The construction, particularly the selvage finish, of twined mats at Danger Cave, appears to be more elaborate than that used on Pecos River specimens. Danger Cave also produced a true cloth, which is absent from Pecos River. On the other hand, the Shumla Site displays greater specialization in its cordage, with feather and hair string.

Only two examples of netting are shown in the Danger Cave report and we are not told whether they were the only examples recovered, whether they were both constructed by larkshead knotting, or what the dimensions are. We are left with the impression that netting was not widely used and that coiling without foundation was unknown.

Plant sources of fibers used in cordage are completely different in the two areas with the exception of flax, which was used in both cultures. And yet, all the plant fibers used in the Danger Cave area—with the exception of *Stipa* (needle grass)—are available in the lower Pecos River area or in the area immediately to the west. We can only conclude that for some unknown reason, inhabitants of the two areas preferred to use different sources for fibers.

Noticeably absent from Danger Cave and the other Wendover sites are artifacts associated with fishing, baby cradles, cigarettes, and perhaps pipes. On the other hand, the Basin sites produced painted gaming sticks which have a widespread distribution in the Southwest. Perhaps gaming devices are a typical Basin development. Bone bars from Danger Cave, unidentified as to function, may also be associated with gaming.

It is unfortunate that data on the ceremonial aspects of the Desert Culture are lacking, for such information could help to clarify possible relationships with other areas. Of particular interest is the practice in the Pecos River Focus of burying the dead within the dwellings. This practice seems to have been quite foreign to the inhabitants of the Danger Cave area, since no true burials were recovered there. There is much evidence pointing to highly developed ceremonial aspects of the Pecos River Focus in contrast to the Desert Culture. Outstanding are evidences of a hunting cult, as indicated in pictographs and painted stones. These evidences could signify that hunting was economically more important to the inhabitants of the Pecos River region, and/or that hunting was pervaded with magico-religious observances to a degree not found in the hunting practices of the Desert Culture. Certain artifacts such as pipes, cigarettes, rattles, rasps, flageolets, mescal beans, and peyote buttons are also indicative of ceremonial rites in the Pecos River Focus. Pipes and musical instruments are not definitely identified at Danger Cave. However, two bone artifacts described from that site may represent a tubular pipe and a bull-roarer. Narcotics (mescal or peyote) have not been reported from Danger Cave or related sites.

Conclusions

As might be expected, Texas and Oklahoma Archaic sites are closely linked by their lithic assemblages. Projectile points overlap both in form and size. Tools such as specialized knives and gouges may provide other links.

The size differences between Danger Cave and Texas-Oklahoma Archaic projectile points immediately distinguish artifacts from the two areas. However, the presence of indented-base points of several types in both the Desert Culture and Texas-Oklahoma cannot be ignored. It is of interest that rectangularly stemmed indented base points of the Pedernales and Montell categories occur as major types both in the Texas Archaic and Danger Cave. The Texas Frio and Uvalde points and the Oklahoma H series, which also fall into an indented base category, must be considered as well. The indented base point, often termed "Pinto" in the West, has a widespread distribution throughout the western states and represent a development parallel with that of a contracting stem point often called "Gypsum" in the West. The earliest known occurrence of a contracting stem point in Texas is the Langtry type, diagnostic of the Pecos River Focus. New evidence indicates it antedates notched points (J. F. Epstein, personal communication). However, with the contracting stem all similarity between Langtry and Gypsum points ends. The Gary-like points of East Texas and Oklahoma are more akin to the western type. If the Gary and Gypsum types represent diffused traits, where is the route of diffusion? The small percentages of indented base points of the Pedernales and Montell types and the absence of "Gypsum"-like points in the Trans-Pecos seems to rule out a southern diffusion route. The Pedernales-Montell types of indented base points are not found in the northeastern Oklahoma series. And indented base points found occasionally in the Eastern Woodlands are of the Frio and H series varieties. It will be interesting to watch for a possible route of influence across the panhandle area of Texas and Oklahoma. We can be justified in a declaration of parallel development only when all possible diffusion routes are ruled out.

There is not much overlapping in point forms between Texas-Oklahoma and the southeastern states as represented in the Indian Knoll series. It has been suggested that the large stemmed point may have originated in the southeastern area and introduced into Texas and Oklahoma and that the Gary-like points found in large numbers in East Texas and Oklahoma may have developed within that area and been introduced into the southeast in turn.

In spite of the number of perishable artifacts shared by the Desert Culture and the Pecos River Focus, the resemblances in this respect are actually superficial. Manufacturing techniques vary considerably and set the two areas apart. Also, it must be borne in mind that Archaic peoples of Oklahoma and the southeastern states were also making baskets and cordage. The perishable materials from these areas which have been recovered to date are probably from a later time level, but they display many of the techniques used in the Pecos River Focus and may have been known at an equally early date (Schuetz, manuscript to be published).

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Archaelogical Salvage in the Twin Buttes Reservoir Area, San Angelo, Texas

F. E. Green

Introduction

During the spring of 1958, the West Texas Museum completed an archaeological survey of the lands which will be inundated by the Twin Buttes Reservoir in Tom Green County. This reservoir will be formed by a dam which is to be constructed approximately seven miles southwest of San Angelo, Texas, and will impound waters from both the Middle Concho and South Concho Rivers. The results of the archaeological survey indicated the presence of at least five sites, but only three were considered of sufficient importance to warrant further investigation (Willis, 1958). Of these three, a midden area on Spring Creek was selected for test excavation by Charlie Steen, Regional Archaeologist for the National Park Service, Region Three. The Museum entered into an agreement with the National Park Service, and the excavation of the selected site was carried out during the week of September 21 to September 26, 1959. This report contains the results of the test excavation of the midden designated as TG-5 in both this and the original survey report.

Funds that made this work possible were furnished by the National Park Service, Region Three, as part of its archaeological salvage program. The Museum, Texas Technological College, provided the equipment necessary to carry out the project and also the facilities for study and storage of the materials recovered. While the excavation was in progress, personnel of the Bureau of Reclamation connected with the Twin Buttes Project were extremely coöperative and offered to assist in any way possible. Mr. Joe W. Barnett, head of the Bureau's Materials Laboratory, was especially helpful, not only in gaining access to the site, but also in taking care of other incidental details which

greatly facilitated the job. To these people and organizations, the writer is deeply grateful.

Site Description

The site designated as TG-5 is located in the west-central part of Tom Green County approximately 10 miles southwest of the center of San Angelo. The midden, which covers an oval area roughly 70 by 100 feet, is situated on a small but prominent knoll 700 feet north of the Spring Creek channel and has an elevation of 1,910 feet above sea level (Figs. 1 and 3).

Spring Creek is an eastward flowing tributary of the Middle Concho River, and as the name implies, contains numerous small seepage springs along the banks of the channel. The Spring Creek channel in the vicinity of TG-5 is approximately 300 feet in width and has rather steep or vertical banks on both sides. At the beginning of the excavation, only the deeper parts of the channel contained water, and only a small trickle of water flowed between the holes. However, before the project was completed, torrential rains had filled the channel from bank to bank and a considerable volume of water was being emptied into Lake Nasworthy, which lies two miles east of the site.

The promontory upon which the midden is situated has fairly steep slopes on its south and east sides, and is the termination of a northwestward trending topographic nose or rise. Hearth areas, generally consisting of a few burned limestone and sandstone rocks and scattered flint fragments, extend northwestward from the midden for a distance of 600 feet and are confined to the crest of the rise.

The midden occupies the central part of the knoll and consists of fill, with no apparent stratification, made up of dark gray silt with abundant pebbles and cobbles of burned and unburned limestone and sandstone, angular fragments of limestone and caliche, and innumerable chips, flakes, and fragments of chert and flint. Mussel shells are also abundant and are interspersed with the other fill materials. The depth of the midden accumulation ranges up to 20 inches, but the surface of the underlying bedrock is very irregular and the average thickness would probably be no more than 8 or 10 inches.

The base of the midden deposit and the promontory itself is an erosion resistant conglomerate made up mainly of pebbles and cobbles of chert, flint, and limestone in a sandstone matrix. This conglomerate is believed to belong to the San Angelo formation of Permian age, and its high content of chert and flint cobbles was undoubtedly responsible

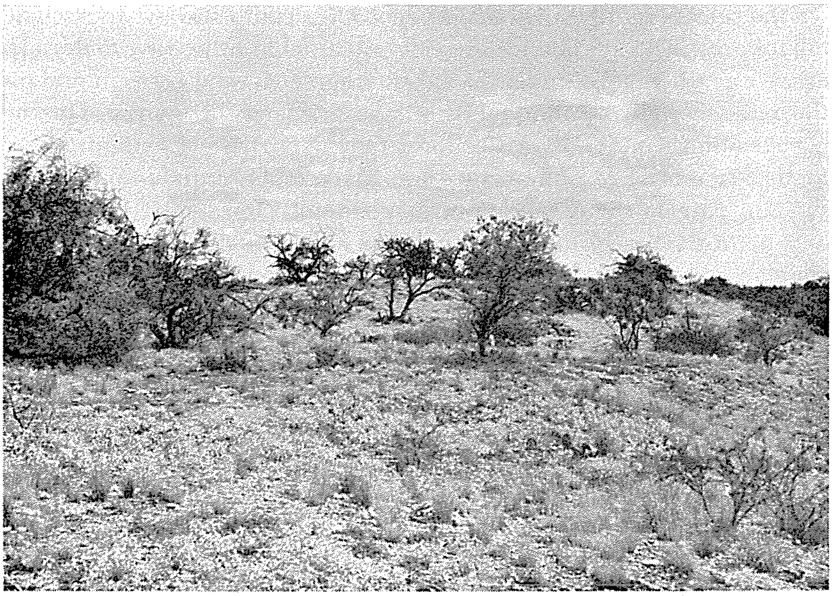

Fig. 1. Rise on which the TG-5 midden is located. Large trees bordering Spring Creek can be seen in the right background.

Fig. 2. View of trench in midden deposit at TG-5. Twin Buttes can be seen on horizon behind tree in left foreground.

for the selection of this particular spot for a camp site by its Archaic inhabitants. The abundance of easily obtainable lithic raw materials, as well as the great number of flakes, fragments, and cores in and on the midden indicate that this site was primarily a quarry. On the premise that site TG-5 was occupied for the purpose of obtaining raw materials, a brief reconnaissance was made to a prominent outcrop of the San Angelo conglomerate approximately 1500 feet west of TG-5 at a point where Spring Creek makes a sharp turn to the south. The conglomerate at this latter locality is well exposed and forms a steep bluff on the stream side. The outcrop is capped by a small knoll covered with the burned rocks of hearths, scattered mussel shells, and thousands of fragments of chert and flint. In addition to the debris on the knoll, hearth areas were noted to occur in high concentration to the east of the knoll for a distance of several yards. This latter site is designated as TG-6 (Fig. 3), and differs from TG-5 in that there is no large single midden accumulation even though the hearth areas are more extensive at TG-6. Also, no projectile points or even fragments of points were recovered from the surface at TG-6, while they do occur on the surface at TG-5.

An unknown amount of soil has been removed from the surface of the prominent rises which mark sites TG-5 and TG-6. This has been accomplished by both wind and water erosion, and the result has been the concentration and mixing of materials on the present surface. All of the hearths that occur to the north of the midden at TG-5 appear to have been let down by erosion, and the burned limestone and sandstone rocks rest on a light tan sterile soil. This is also true of most of the hearths on the knoll at TG-6; however, off the eastern slope and topographically lower, the hearths have been buried to a depth of two feet in some places and may be seen in the banks of shallow eroded gullies.

Methods and Procedure

The purpose of the excavation at TG-5 was to determine by trenching whether or not stratification and separation of cultural materials existed within the midden. Consequently, prior to staking out the trench, several small test holes were dug at random spots on the midden, and the trench was then laid out to cut through the thickest part of the accumulation. An examination of the plan view and cross-section (Fig. 4) will show that the thickest midden deposits are on the

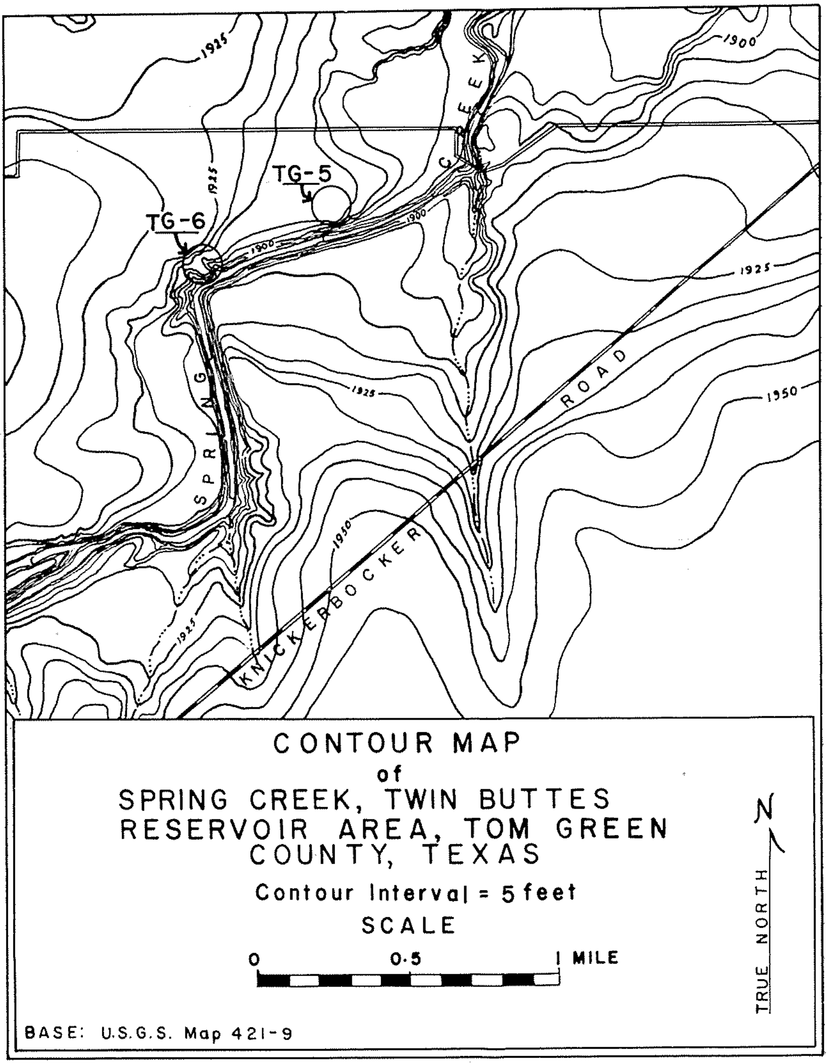

Fig. 3.

northwest side, and also shows the relationship of the trench to the midden.

The trench was laid out in a north-south direction and blocked off in squares four feet wide and five feet long for labeling purposes. Excavation consisted of removing the material in six-inch layers down to the thin caliche crust which caps the San Angelo conglomerate. All

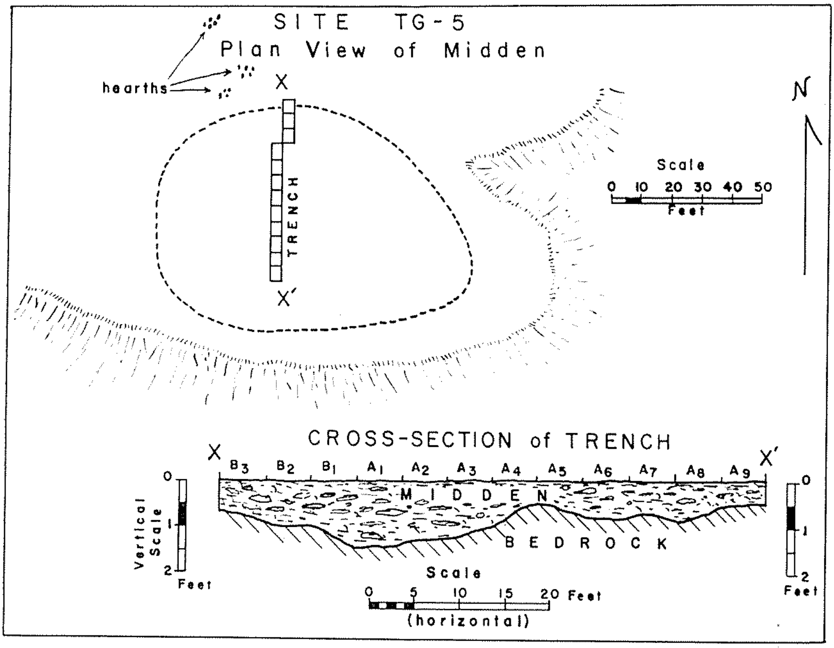

Fig. 4.

material removed from the trench was screened and all of the larger flint fragments, whether worked or unworked, were retained. An estimated 15 per cent of the total flint scrap was discarded because of small size and the time required for sorting on the screen.

Analysis of Artifacts

Because of the abundance of raw material at site TG-5 and the probability that it was primarily occupied for the purpose of mining chert and flint, there is a profusion of spalls, flakes, and cores showing varying degrees of work. For this reason, and the fact that most of the artifacts are crudely made, no attempt was made to sort questionable items at the time of screening. These materials were brought in to the laboratory and washed before sorting and tabulating.

Even in the smaller archaeological samples such as this one, there are usually some artifacts which defy typing. This is also true of the materials from the trench at TG-5; however, the major problem is the separation between the partially chipped flakes or rejects and poorly made tools. Thus an arbitrary and artificial category called "worked flint" is used to include all of those flakes which show deliberate chipping on one or more edges, but which lack shaping that would permit them to be classified as scrapers or blades with reasonable certainty.

Projectile points. All of the projectile points fall under the dart point category, and the types are listed in Table 1, which also shows the vertical and lateral distribution of the different types. Most of the points were recovered from the uppermost six inches of the midden deposit, with a few specimens from the six-to-twelve inch level, and none from the twelve-to-eighteen inch depth. The predominant types making up the sample are Uvalde, Pedernales, Bulverde and Langtry,

TABLE 1

Lateral and Vertical Distribution of Projectile Points

Depth	TYPES	B_3	B_2	B_1	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	TOTAL
0–6"	Uvalde	1	..	..	1	..	1	..	..	..	1	..	..	4
	Pedernales	..	..	..	..	..	1	..	..	..	1	1	1	4
	Bulverde	1	..	..	..	..	..	..	1	1	..	..	..	3
	Langtry	1	..	..	2	..	..	..	..	..	..	..	..	3
	Frio	..	1	..	..	1	..	..	..	..	..	..	..	2
	Lange	..	..	1	..	..	..	..	1	..	..	..	..	2
	Castroville	..	1	..	..	..	..	..	..	..	..	..	..	1
	Williams	..	..	..	1	..	..	..	..	..	..	..	..	1
	Kinney	..	..	..	..	..	..	..	1	..	..	..	..	1
	Martindale	..	..	..	..	..	..	..	..	..	..	..	1	1
	Marshall	..	..	..	..	..	..	..	..	1	..	..	..	1
	Unidentified	..	..	1	1	2	..	..	3	..	..	1	..	8
6"–12"	Uvalde	..	..	..	1	..	..	..	..	..	..	..	..	1
	Langtry	..	..	..	1	..	..	..	..	..	..	..	..	1
	Pedernales	..	..	..	1	..	..	..	..	..	..	..	..	1
	Lange	..	..	..	1	..	..	..	..	..	..	..	..	1
	Unidentified	..	..	..	2	..	..	1	..	..	..	..	..	3
12"–18"	NONE													

with several other types represented by only one or two specimens. This assemblage is characteristic of the Edwards Plateau Aspect, and the only unusual occurrence is the presence of Langtry points (Fig. 5, No. 3, and Fig. 6, No. 2). Four incomplete Langtry points were recovered from the test trench, and although they show crude workmanship, they fall well within the range of variation of the type. In fact, these points also fall within the range of the Gary point type of northeast Texas, but the latter points are usually thicker and narrower.

Scrapers. Excluding projectile points, scrapers constitute a major percentage of the other artifacts recovered, and they occur at all three levels (see Table 2). However, there is no predominance of any one type. The collection is made up of almost equal numbers of end-scrapers, crudely made side-scrapers, flint nodule or pebble fragments with chipped edges, and primary core flakes with the thin edges sharpened by pressure flaking. Scrapers showing better than average workmanship are illustrated in Figs. 5 and 6.

Ovoid blades. These are rather thick, percussion-chipped tools ranging from 5 to 7 centimeters in their greatest dimension, and from 1.5 to 4 centimeters thick. Their occurrence has been noted from burned rock mounds in the central Texas area and from middens in the Abilene area. They apparently have no diagnostic value in regard to foci within the Edwards Plateau Aspect.

Gouges. A total of eight gouges was excavated at TG-5, and most of these are incomplete. They consist of thick rectangular or triangular percussion chipped blades, and are bi-convex in cross-section rather than plano-convex as are the Clear Fork gouges (Ray, 1938). These tools were compared with the gouges in the Ray collection stored at the museum, and there are no apparent affinities other than general shape between the gouges from TG-5 and those of Ray's Clear Fork Culture (Focus).

Knives or blades. Complete specimens of this type are lacking and, for the most part, this category is made up of thin, fairly well chipped broken tips or mid-sections of knives. Other fragments of more crudely worked, but distinctly edged blades make up the remainder of this type of artifact.

Drills. Three drills are represented in the sample; two by drill points, and one by a specimen lacking the point (Fig. 6, No. 6). This latter artifact is tanged and is of the type usually considered to be a reworked projectile point. However, the chipping seems to indicate that the design of the flaring base and tang with narrow drill point was the original purpose of manufacture, and that the drill was not an alteration.

Gravers. Of the four gravers found, two are flat rectangular flakes with small narrow projecting graver points on the short side of the

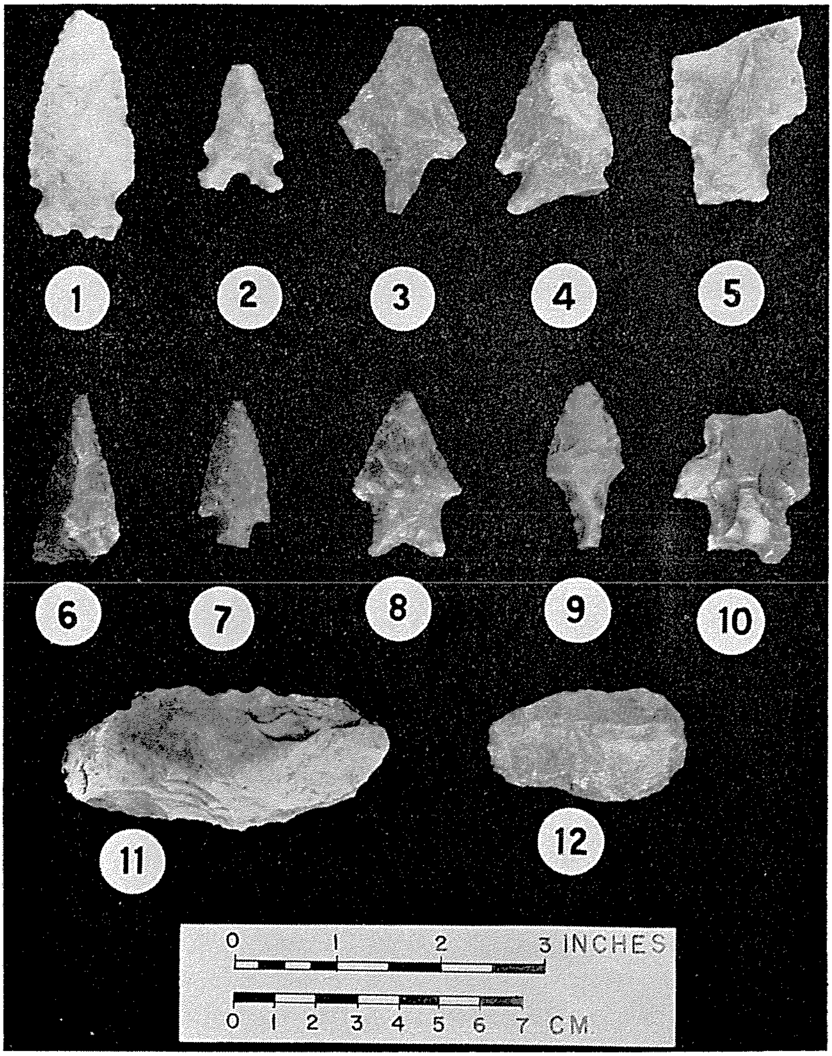

Fig. 5. Artifacts from uppermost six inches. 1, 4, 8, Uvalde points; 2, Frio point; 3, Langtry point; 5, 7, Bulverde points; 6, Kinney point; 9, unidentified point; 10, Pedernales point; 11, gouge; 12, scraper.

flake. The other two are triangular flakes with the apex finely chipped on one side to form a flat beak-like point.

Chopping tools. Three large percussion-flaked artifacts have been tabulated as chopping tools or hand axes. The largest of these is shown

TABLE 2

Lateral and Vertical Distribution of Artifacts

Depth	TYPES	B_3	B_2	B_1	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	TOTAL
0–6"	Scraper	4	1	1	1	1	1	..	..	..	..	2	..	11
	Ovoid blade	..	..	3	..	1	..	..	..	3	..	..	1	8
	Gouge	..	2	..	1	..	..	2	..	..	..	..	..	5
	Knife or blade	..	..	2	1	2	..	1	2	4	4	2	..	18
	Drill	..	..	..	..	1	..	..	..	..	..	..	1	2
	Graver	..	..	1	..	..	1	..	..	..	..	2	..	4
	Worked flint	..	1	9	10	15	21	7	22	11	8	7	6	117
6"–12"	Scraper	..	..	..	..	1	..	1	..	..	1	..	..	3
	Ovoid blade	..	..	..	..	..	..	..	..	..	2	..	..	2
	Gouge	..	..	..	..	1	..	1	..	..	1	..	..	3
	Knife or blade	1	1	..	..	2	..	..	2	..	..	..	..	6
	Drill	1	..	..	..	..	..	..	..	..	..	..	..	1
	Chopping tool	1	..	..	..	1	..	..	1	..	..	..	..	3
	Worked flint	..	2	3	7	1	2	1	..	1	3	..	..	20
12"–18"	Scraper	..	..	1	..	..	..	..	..	..	..	..	..	1
	Knife or blade	..	..	1	1	..	..	..	..	..	..	..	..	2
	Worked flint	..	..	5	1	..	..	..	..	..	..	..	..	6

in Fig. 6 (No. 5), and this one may have been hafted and used as an axe, although there is no notching or thinning in the center.

Worked flint. This category is defined at the beginning of this section and probably includes some items which would be classified as scrap or workshop debris by other authors. It has been pointed out, however, that all of the flakes in this class show some intentional chipping and are not simply random flakes struck from pebbles or cores.

Miscellaneous. Only one small fragment of a grinding stone (probably a milling stone) was found during the excavation. This is surprising since numerous flat slabs of sandstone which would serve as excellent blanks are present in the terrace deposits below the midden, and they are also common in the burned rocks found in the midden but none shows any signs of wear. A complete basin-type milling stone and one-hand mano were found in a shallow wash several hundred feet east of the midden, and a few fragments of these grinding implements were noted in the hearth areas at site TG-6.

One other item of note is the abundance of fresh water mollusc shells which occur throughout the midden deposit and around the

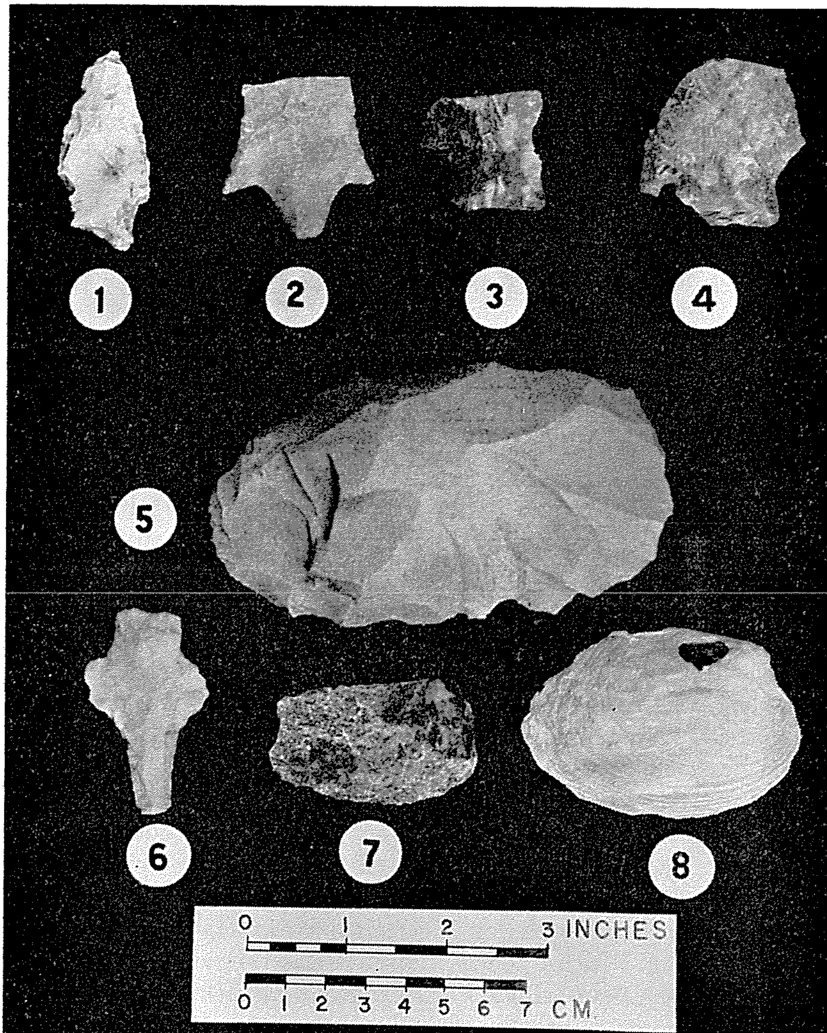

Fig. 6. Artifacts from six-to-twelve inch depth. 1, Uvalde point; 2, Langtry point; 3, 4, Castorville points; 5, ax or chopping tool; 6, drill; 7, scraper (from 12-to-18 inch depth); 8, mussel shell with hole drilled near margin.

hearths. At least three different species of mussels are represented in the collection, but of all the shells examined, only one shows evidence of being worked (Fig. 6, No. 8), and this has a single hole drilled near the margin.

Discussion

In the original survey report of the Twin Buttes Reservoir area, Willis (1958) concluded that the midden at site TG-5 belonged to the Round Rock Focus of the Edwards Plateau Aspect. This was apparently based on the presence of a Pedernales point found on the surface.

There is considerable confusion in the literature in regard to foci within the Edwards Plateau Aspect, and a lack of documented excavations which might serve to clarify the problem. As defined by Kelley (1947a, 1947b), the Edwards Plateau Aspect includes the Clear Fork, Round Rock, and Uvalde foci. Suhm, Kreiger, and Jelks (1954: 106–107) do not follow this classification because of the lack of clear-cut data, and treat the Edwards Plateau Aspect as a unit.

Although a thorough treatment of this problem is beyond the scope of this report, the artifact assemblage from TG-5 is considered distinctive enough to merit consideration in respect to differentiation between the three foci of Kelley. The first separation of central Texas cultures appeared in Pearce's (1932) summary of Texas archaeology. He illustrated artifacts (*ibid.*: Plate 10) of three different levels of his "Texas Kitchen Midden" culture, and those of the Bottom level clearly belong to the Clear Fork Focus, while those of the Middle level would be classified as belonging to Kelley's Round Rock Focus because of the Pedernales points present. Kelley (1947a: 99) states that the Round Rock Focus is the same as Sayles' "Round Rock Phase" and probably "Guadalupe River Phase;" and Sayles (1935: 53) considered his "Round Rock Phase" to be the same as Pearce's Middle level of the "Texas Kitchen Midden" culture. Pearce's report is not detailed, but if his separation is valid, the differentiation between Round Rock and Clear Fork foci by Kelley is certainly valid. However, a review of reported sites, which under Kelley's criteria should be classified as belonging to the Round Rock Focus, shows that Clear Fork elements are usually present. Even the characteristic points of Sayles' "Round Rock Phase" include Nolan points, which are considered by Kelley as diagnostic of the Clear Fork Focus on a frequency distribution basis. Seemingly, Nolan points and Pedernales points should be treated as characteristics instead of diagnostics of their respective foci. Other examples of Clear Fork and Round Rock "mixtures" are as follows: (1) The Lehmann Rock Shelter of Gillespie County contains artifacts in Stratum II which Kelley (1947b) assigns to all three foci (Clear Fork, Round Rock, and Uvalde). (2) The Merrell Site in Williamson County consists of midden deposits in an alluvial terrace, and Campbell (1948) reports that diagnostic elements of both Clear Fork and Round Rock Foci are present. (3) The Collins Site in Travis County (Suhm, 1955) contained a respectable percentage of both Nolan points and Clear Fork gouges in an assemblage which might otherwise be classed as falling under the Round Rock Focus. On the basis of distinctive lithic characteristics, the term Clear Fork Focus seems to be justifiable; however, the separation or identification of Round Rock Focus components in the Edwards Plateau Aspect is understandably difficult.

The third, and least known focus of the Edwards Plateau Aspect was named the Uvalde Focus by Kelley (1947b: 116), who stated that it comprised the upper and middle levels of Huskey's (1935) "Mound A" culture and the "Late Edwards Plateau" culture of Sayles (1935). Kelley (1947b: 124) lists Frio, Montell, and Smithwick Small Stem (Marshall) points as being diagnostic of the Uvalde Focus. Projectile points illustrated by Huskey (1935: Plate 14) as occurring in the middle and upper levels of the "Mound A" culture appear to include Ensor, Lange, Smithwick Small Stem (Marshall), Montell, Bulverde, Langtry and Marcos types. The lower level of Huskey's "Mound A" culture is omitted from the Uvalde Focus by Kelley, presumably on the basis of the presence of Pedernales points.

The Uvalde Focus is of primary importance in that site TG-5 may represent a component of this culture. An examination of Table 1 will show that Uvalde and Pedernales dart points are equally represented by five specimens each. The Uvalde points as yet have no diagnostic value within the Edwards Plateau Aspect, and are not connected with the Uvalde Focus in spite of having the same name; thus, using Kelley's criteria for separating foci, TG-5 would be classified as belonging to the Round Rock Focus. An evaluation of the entire assemblage of the cultural materials from site TG-5, however, seems to indicate that it has closer affinities with the Uvalde Focus than with the Round Rock Focus for reasons stated as follows:

1). Neither characteristic nor "diagnostic" Clear Fork elements are present in the materials from TG-5, and it has been pointed out that these elements are consistently present in sites which Kelley's system would assign to the Round Rock Focus.
2). Four Langtry points in the TG-5 assemblage indicates a stronger influence from the southwestern part of the state than from the Austin and Abilene areas.
3). The abundance of mussel shells and the paucity of animal bones in the TG-5 midden may indicate a preference for molluscs as food by

the occupants. A strong parallel is seen in the "Mound A" culture with its abundant burned and unburned shells, and Huskey (1935: 106) concluded that snails were the principal food of the primitive inhabitants of the Nueces Canyon.

4). Among the distinctive elements of the Round Rock Focus listed by Kelley (1947a: 100) are numerous manos and grinding slabs, side-notched pebbles, and spike-like blades. These last two items were not found at TG-5, and the rarity of grinding implements has already been noted. Huskey makes no mention of manos or milling stones in the mounds of the Nueces Canyon, so one must assume that they were either absent or of rare occurrence.

Summary

The test trench through the midden at TG-5 produced materials which suggest that this site is probably a component of the Uvalde Focus of the Edwards Plateau Aspect, which belongs to the Archaic stage. The thickness of the midden itself seems to preclude an extended occupation over hundreds of years, and the presence of Langtry and Frio dart points may refer the occupation of this site to the latter part of the Archaic stage.

The abundance of mussel shells in the midden and near the hearths indicate that molluscs were the most important food item gathered by the inhabitants. The quantity of worked flint and flint scrap, and the locations of TG-5 and TG-6 on knolls formed by remnants of the San Angelo conglomerate which contains numerous flint and chert pebbles, both suggest that these sites were primarily occupied for the purpose of obtaining lithic raw materials.

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Deductions Concerning the Clear Fork Gouge

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DURING THE nineteenth century several discoveries of evidences of ancient man in America were made by reputable observers, but they were met with so much ridicule and abuse that the evidences were soon forgotten. It seems that the leaders of American anthropology at that time had evolved a theory that none but American Indians of Mongoloid stock had ever lived in America, and they for only about two thousand years. These people had written books advocating that theory and resented any disbelief in it. It is hard now to realize how venomously anyone's veracity was attacked, even as late as 1925, if he presented evidence suggesting that this idea was not entirely correct.

Personally, the writer never believed a word of this theory, because it was an illogical deduction. After all, at that time all scientific circles also believed the evidence that huge animals of proboscidean types and of numerous widely differing species had gone back and forth across the Bering Straits for a long enough time to have evolved numerous different species on each continent. If the animals had done it, man could do it too.

Into the hostile atmosphere of that time Dr. Harold J. Cook, then paleontologist of the Colorado Museum of Natural History, exploded in 1927 the news of his discovery of three flint blades imbedded among the ribs of a Pleistocene bison, in the gravel bank of Lone Wolf Creek near Colorado City, Texas.

This discovery gave the writer the idea that if ancient man lived only seventy-five miles away he probably also lived near Abilene, and I could think of nothing more thrilling than finding his remains. So thenceforth anything involving time-consuming spectator entertainment and speeches by bores went out of my program. During the summer of 1927 I started a week-end search of the countryside with all of the fervor of the seekers of the Holy Grail.

Gravel pits and river beds, and high gravel ridges where ancient rivers once ran, and present day river banks from vertical cliffs forty feet tall to the water's edge, were closely examined and many evidences of ancient man's presence were found in most of them (Ray, 1929; note p. 18 and Pl. 1, lower panel, nos. 8–11; this is the first mention in scientific literature of the Clear Fork Gouge). The implications of some of these evidences are so vastly ancient that the times are still not ready for publication on them. Even during the first year I found the bones of a strange curved boned race, and with them two petrified shell beads, which no doubt had mineralized after they were carved and drilled. I also found great numbers of previously unknown artifacts of several different culture types, and these discoveries have been described in the early bulletins of this society (Ray, 1930; note p. 46, "Limestone Incrusted Artifacts;" Pl. 10, no. 2).

The subject discussed here will be one ancient implement type out of the Clear Fork Culture, the gouge (Ray, 1934; Clear Fork Gouges shown on Pl. 18, nos. 101, 102, 104, 106, 109, 110, 111). Early in my research I began to find gouges on the highest gravel-strewn terrace tops which parallel present day streams at distances of a mile or more (Ray, 1938: 193, Pls. 24 and 25). These specimens were thick percussion-fractured blades with curved or scooped-out cutting edges at the larger ends. These tools were later found deeply buried in pure culture aggregations composed of a great variety of deeply patinated tools of either previously undescribed types or of implements which greatly resembled European paleolithic tools (Ray, 1940). Within a few months in 1927 I had collected about fifteen gouges of various sizes which I would arrange in a row and ask visiting scientists to name, and none of them could do so, nor had they ever seen them before. One collector tried to convince me that the gouges were not purposely made tools, but were flint cores which had accidentally taken on such a shape. However, the uniformity of the curved cutting edges showed them to be some specialized form of tool. Years later I delivered over five hundred gouges to the Museum of Texas Technological College at Lubbock with my collection of stone tools and ancient skeletons.

While there are several distinct types and sizes of gouges, with the ends opposite the broad end finished into borers, chisels, knives, and spatulas, all have the curved cutting edges at the broader ends. The production of this type of end seems to have been so dominant in the practices of Clear Fork men that a recognizable trace of the same trait exists on the bases of many of the long fine knife blades of Clear Fork time, and also on the bases of a few of their dart points also.

The base on these specimens has a square cut across the end, and on one face is a shallow flaked depression.

There has been considerable speculation about the uses of the Clear Fork gouge. Evidently it was not a woman's hide scraper, as the culture was abundantly supplied with large, crusted, flake side-scrapers, and gouges were not abundant enough in any site to supply such a need. I felt unusually successful if I found six or eight gouges in a full day of searching over heavily eroded areas in the red silts of the mountain valleys where the Clear Fork hearths lay exposed. It is unlikely that other collectors had found them ahead of me, because at that time few collectors collected anything besides arrow heads.

The scooped-out cutting ends might suggest that the gouges were hafted and used as we do garden trowels, to dig roots for food; and their scattered distribution on mountain slopes, where such plants grow, might suggest the same function. It is evident that some gouges were pushed across a material of sufficient hardness to polish areas on the flat faces. Both the specimens made on a flake with one flat face, and those flaked all over, show such signs of polish. At that distant period soft wood species of trees suitable for wood-working with stone tools may have lived in a wet cool climate. We once found a large gouge in mountain gullies in which Clovis points were also found; this gouge had three smooth notches cut into the sides and end which evidently were made so as to fit it to be tied to something. We have wondered if some of the gouges could have been used as counterweights on the throwing sticks of atlatls.

Gouges have been found which have a calcium incrustation such as occurs commonly on the older flaked stones from the old gravel beds of the region, and this feature occurs fully as often on gouges as on Clovis points. In the thirty-one years that gouges have been under our observation we have seen no evidence that they were made or used at a time later than many thousands of years before pottery was made in Texas. There are twenty or more feet of silts separating them in river banks where the ancient silts still lie in regular age sequence. We do know of two sites, however, in the Abilene region, where the forces which aggrade apparently have balanced those which erode so evenly that as each generation of types of men occupied the low creek bank sites, their various types of flint tools were let down into a common soil mixture of everything from Folsom and Clovis points, and Clear Fork gouges, on up to the unpatinated arrow heads and end-scrapers of the latest pottery culture of the region, the Valley Creek.

In such sites, examples of almost everything used by stone age man

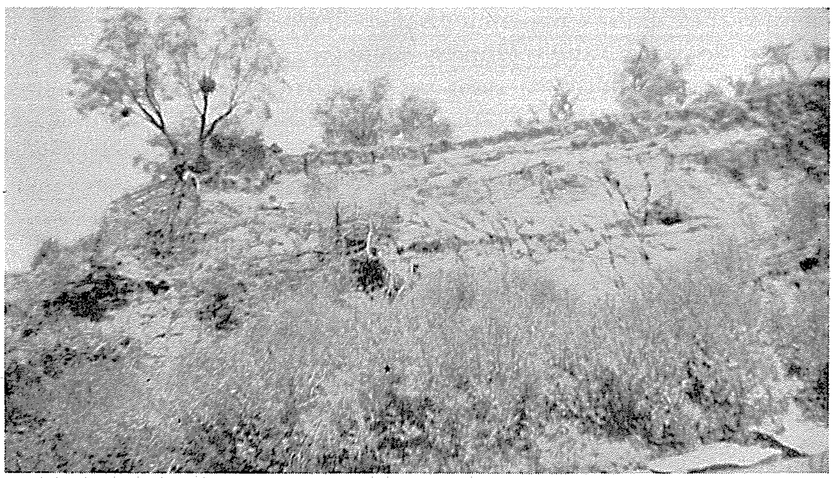

Fig. 1. Two views of the Hodges Site, looking east. The photographs were taken in 1959. The section of the bank shown in the top photograph is to the right (south) of that in the lower view.

The bank has caved off and its lower half is covered with top silts in which vegetation has grown, so that study of the lower part of the bank is more difficult than when the site was first described. In the upper photograph, and the right-hand part of the lower photograph, horizontal lines mark major changes in silt textures and colors, and probably indicate climatic changes as well. They probably also denote old valley floor levels which persisted for considerable time periods. There was a tendency for camp site hearths and debris to accumulate on these lines.

The Clear Fork Culture camp site formerly exposed in the Hodges site was to the south, beyond the right end of the upper photograph, in the lower zone of vegetation. The excavation made by the W.P.A.-Texas Technological College was at the left end of the lower during the ages back to the Pleistocene can be found on one plowed field. Such sites are very confusing to an inexperienced student until he has worked out the correct age placement of the artifacts in undisturbed stratified deposits. All over a vast area of the Callahan Divide, which separates the watersheds of the Colorado and Brazos Rivers, three distinct sheets of silt were laid down, largely by wind action as well as water, which have the same relative placement on the uplands as along the river valleys below. The top silt layer is composed of the pinkish-tan sandy Nugent Silts. The second layer is composed of red silt and gravels of the Upper Clear Fork Silt, and below that is the dark red clayey Lower Clear Fork Silt.

In this area most of the light sandy Nugent Silts have been carried away by the runoff from steeper slopes in the mountains, and this erosion has exposed large areas of the two older more compact Clear Fork Silts, which lie below the Nugent Silts, so that they can be inspected from their top surfaces. Here whole campsites lie imbedded, which date from Clear Fork times, and numerous hearths lie exposed in the Upper Clear Fork Silt. In the deep gullies worn down into these silts the Clear Fork hearths and implements occur in a zone of gravel between the Upper and Lower Clear Fork Silts. Once the Upper Clear Fork zone of occupation has been identified, it can be easily traced all over the area as the gravel zone in which most of the ancient hearths are found. Whereas some of the campsites may be observed on the top of eroded silt surfaces, sites of the same age in the lower river valleys are covered with twenty or more feet of Nugent deposits, and it is like hunting for a raisin in the edge of a layer cake to find a flint blade in the edge of a stratum only a few feet thick along a steep vertical river bank (Ray, 1944–45; 1946; 1955).

Another thing not understood by the casual observer is that a river bank thirty feet high may have at one place a complete stratified record in it from the most recent Indian back to Pleistocene man, whereas a few hundred feet upstream or downstream the same bank may have been gullied and later refilled to the same height—a process

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photograph. The large mesquite tree marks the southern edge of that excavation, which was made into a recently refilled river bank deposit. The ancient river strata indicated by the horizontal lines in the upper photograph extend across the lower view and end at the dark spot about 25 ft. south of the W.P.A. excavation. From the dark spot northward to the end of the bank, the silt has no stratification and is of uniform texture and color from bottom to top, and doubless is no more than a few hundred years old. Consequently, the W.P.A. excavation was made in a fill that is of no value in determining the age of the ancient silts.

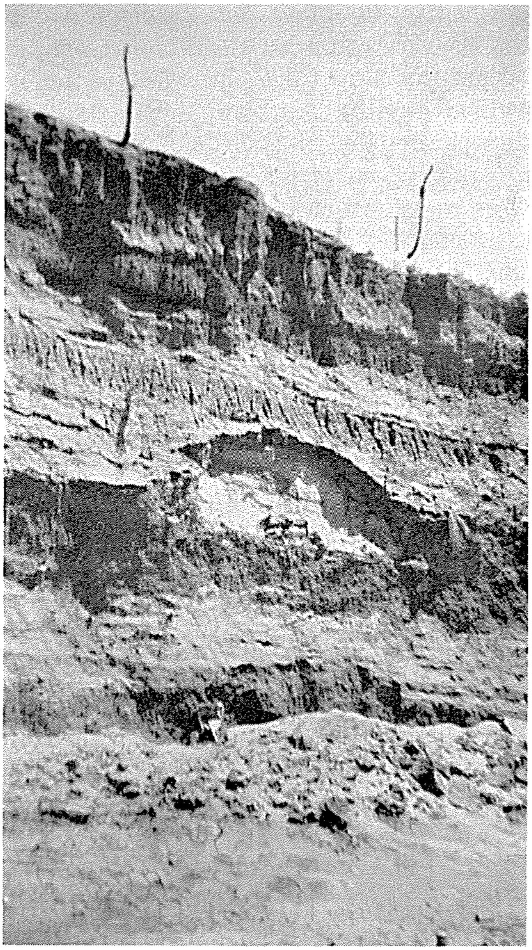

Fig. 2. The Gibson Site on Elm Creek, as it appeared in 1959. When discovered by the writer in 1930, it contained numerous hearths, abundant charcoal deposits, man-made flint chips, and some complete flint artifacts, eroding from strata varying in depth from 24 to 30 ft. below the surface. The material was exposed for a distance of 125 ft. along the bank. The situation at that time is shown in Ray, 1930, Plate 11, Figs. 3 and 4, and Plate 15.

The site is situated where Elm Creek, turning sharply east from a north-south course, undercuts the bank and causes cave-offs. The bank is 30 ft. high and has probably receded westward as much as 20 ft. during the 30 years it has been studied. During all of that period charcoal, flakes, hearths, and occasional complete Clear Fork points and other ancient point types such as Clovis points have been found imbedded in the hard red silt in the Upper and Lower Clear Fork strata shown near the bottom of the bank.

At the present time campsite evidences seem to be thinning out, but in this latest picture a considerable deposit of charcoal shows in the hard red silt 8 ft. directly below the left end sometimes taking only a few hundred years—the new fill consisting of top-level plow-depth silt containing unpatinated flints of the most recent stone age Indians of the region. Such a bank refill is an amorphous sand bar mixture of no age significance. It may contain anything formerly held by the older banks above it. The serious student can learn to identify this development easily near Ft. Griffin, as there is no stratified banding in such recent refills and the sandy textured amorphous silt is of the same color from top to bottom.

We visited the excavation at South Bend while it was in progress. It was situated where two branches of the Brazos River join, with a narrow sand bar between them, and the site consisted of a deposit of amorphous sandy silt left by the overflows of the two streams. There was no stratification from the bottom to the top of the bank, and it was all of the same color and texture. Here people of the latest flint culture of the region, the Valley Creek, had buried their dead during dry periods, and may have lived on the same sand bar during similar times between floods. Accretion evidently progressed rapidly in such a place and the grave depths mean nothing of any age consequence on a sand bar, and any serious student of anthropology should know better than to attempt such conclusions as have been made by some. Such refills occurred extensively near Ft. Griffin and at intervals all along the branches of the upper Brazos River. The Valley Creek Culture there also contains Rio Grande trade potsherds such as were alleged to have been found in the South Bend sand bar. Long ago Dr. Mera of the Laboratory of Anthropology in Santa Fe identified Pueblo sherds I sent him from a Valley Creek site as "Rio Grande Glaze paint ware which was dated from early in the 14th century A.D. to about 1700" (Ray, 1935: 83–84).

In the Abilene region there are several recent refills of areas adjoining ancient stratified river bank deposits, and these have caused some serious errors by unwary diggers sent there. There is one top-to-bottom refill of amorphous silt adjoining the Gibson Site on the northeast end, and another one was at the north end of the Hodges Site until it was excavated at great expense by the W.P.A. with no definite results. In the latter case, we asked the Texas Technological College to excavate a Clear Fork Culture site several hundred feet south of where they decided to do their work. They dug out a recently refilled river bed where the stream ran not more than a few hundred years

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of the bottom of the large cave-off scar in the center of the picture. The marker set on the charcoal shows dimly on the lowest dark stratum. Just below that is caved-off material at the base of the bank, and the light area below that is the dry creek bed.

ago. The old filled channel could still be traced by its outlines, as it had cut through the north end of the ancient stratified deposits, and also by a chain of shallow surface sloughs which had not yet entirely refilled and still held water after rains. Why the superintendent of the excavation rejected our recommendations we do not know. On the spot I had picked to dig, a Clear Fork Culture accumulation of burned rocks in a long line had been eroding for years at a depth of twenty feet in the ancient stratified section of the bank. From the exposed edge of the deposit I had dug portions of a Clear Fork metate, a whole worn mano, and two Clear Fork Gouges, along with considerable charcoal.

The mistake made at the Hodges site can still be seen plainly if one views the whole east bank from the top of the west bank when the late afternoon rays of the sun illuminate it fully (Fig. 1). The banded or stratified deposit is seen to stop near the south end of the W.P.A. excavation, and the bank from there northward to the edge of the excavation is seen to be an amorphous recent Ft. Griffin type of refill from bottom to top.

Reverting to the claims that four Clear Fork Gouges were found in the South Bend sand bar with a Rio Grande potsherd, and that it proves that the gouge is only a few hundreds of years old, the writer visited the site while it was being excavated, and only Valley Creek flints were shown to us, but no gouges, and the pictures shown in the later report were too poor to tell whether they were of gouges or not; but if they were, it proves exactly nothing. We once found a section of the bone which supported a Permian Ship Lizard's dorsal sail fin in a hearth deposit of the 24 feet deep Upper Clear Fork Silt level at the Gibson Site, which was also full of charcoal and burned rocks, and in which Clear Fork darts were found. However, we did not rush into print with any great discovery that the Ship Lizard of the Permian Period lived until Clear Fork times.

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Abilene, Texas

The Elida Site, Evidence of a Folsom Occupation in Roosevelt County, Eastern New Mexico

JAMES M. WARNICA

EARLY MAN SITES afford us a dim view into a distant past, but because of their scarcity the knowledge has come to us very slowly, bit by bit. The information these sites provide is priceless, and for the most part a great amount of time and labor is required to collect and compile the data obtained from them. Hunting or kill sites give us a very good idea of how the early hunters killed and butchered large game animals, which was their primary source of food. This knowledge comes mainly from the projectile points that were left in the animal when it was killed and butchered. Today as excavations are carried out these projectile points are found with the fossil animal remains and are assumed to be, for the most part, the primary cause of death at the hands of Early Man.

Campsites generally provide a better record of the culture of these early peoples. This record tells something of their way of life that would not be known were these campsites not found and the information they provide not published. This paper is an account of the discovery of a Folsom campsite and the artifacts found there.

This site, here named the Elida site, is located in a sand dune area six miles east and 12 miles south of Elida, Roosevelt County, New Mexico, on the Bill Smith Ranch. This locality is some 27 miles south-southwest of Portales, New Mexico. At one time the site was a cultivated field, but it has long since been abandoned and wind erosion has scoured it down to a caliche formation over a large area. The artifacts were found resting on this caliche formation, which normally underlies a red sandy-clay stratum. It is believed that the surface-collected artifacts were originally in the lower part of the sandy-clay stratum or in the top part of the caliche. The materials collected suggest that the Elida site was not only a campsite but a workshop area.

The site was first visited in the afternoon of April 29, 1956, by

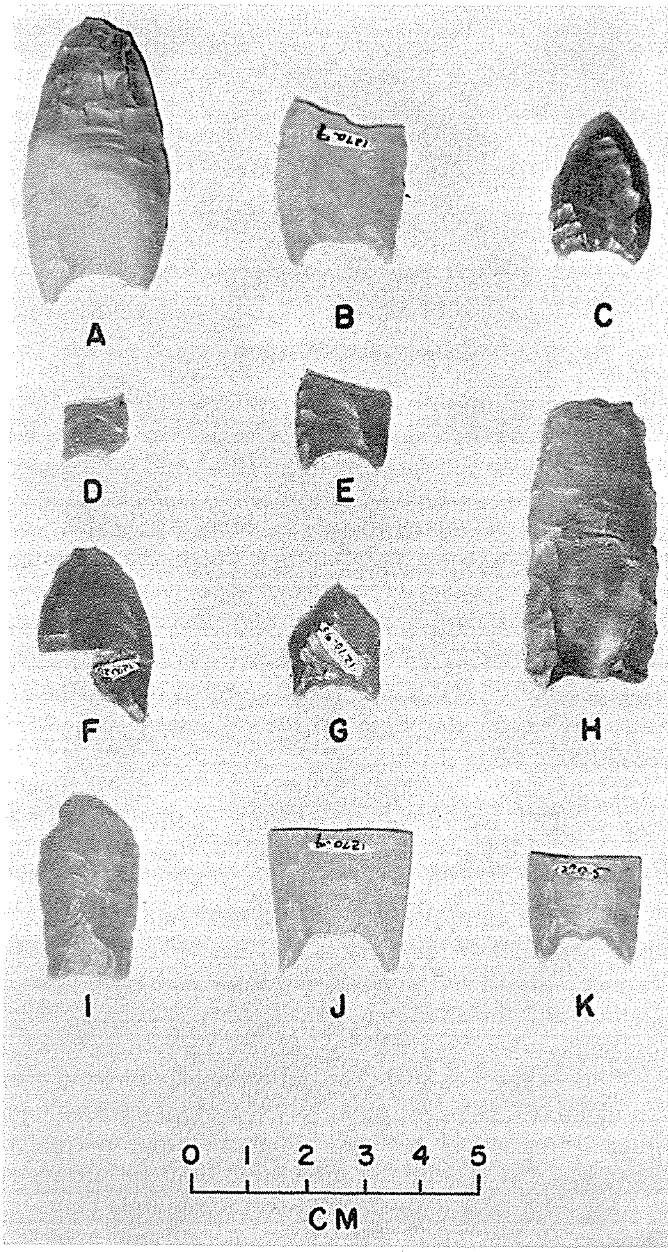

Fig. 1. Projectile points from the Elida site, eastern New Mexico.

Charles Harrison and James M. Warnica of Portales, New Mexico. Because of the lateness of the hour only a short time was spent at the site. One complete projectile point (Fig. 1, A), one basal fragment of another point (Fig. 1, J), and one scraper were collected on this visit. At the time it was not realized that this was a Folsom campsite.

A second visit to the site was made two days later. The individuals making this second visit were Charles Harrison, D. L. Hankins, and James M. Warnica of Portales, New Mexico, and Don Krieble of Lubbock, Texas. The artifacts collected at this time included one complete projectile point (Fig. 1, C), another point with the distal tip missing (Fig. 1, B), and a third point that seems to have been broken when fluting was attempted (Fig. 1, H), as well as several scrapers and tiny, finely chipped gravers, and a large number of small flint chips, the residue from manufacture of artifacts. This assemblage seemed to indicate a Folsom campsite, and Dr. E. H. Sellards of the Texas Memorial Museum in Austin, Texas, was notified.

A third visit to the site was made in June, 1956. The party consisted of Dr. E. H. Sellards and Otto Schoen of the Texas Memorial Museum, Don Krieble of Lubbock, Texas, and James M. Warnica. The time was spent in collecting artifacts from the surface and studying the site. One complete projectile point (Fig. 1, I), two basal fragments (Fig. 1, D, K), and a few scrapers and gravers were collected.

To date a total of 82 artifacts has been collected from the Elida site. These include eight complete or relatively complete points, 16 fragmentary points, 32 scrapers, 13 gravers, four channel flakes from fluted points, nine miscellaneous implements, and a large number of flint flakes.

One point (Fig. 1, H) appears to have been broken when the Folsom people attempted to remove a channel flake. The person who made the point roughly shaped it; then he seems to have placed the tip against a solid object and struck the base a sharp blow. The fracture traveled up the face for 23 mm. and then turned abruptly through the middle of the blade, breaking it into two parts. Evidently the force of the blow caused a smaller flute to travel from the tip for 20 mm. back toward the base on the opposite face of the blade from the main flute. When found the point was in three pieces some distance apart. When placed together they fit perfectly. Only the channel flakes are missing.

The only fossil remains found in the campsite area were a few fragments of animal teeth, but there is no proof of their association with the artifacts.

It must be assumed that the climate was considerably different

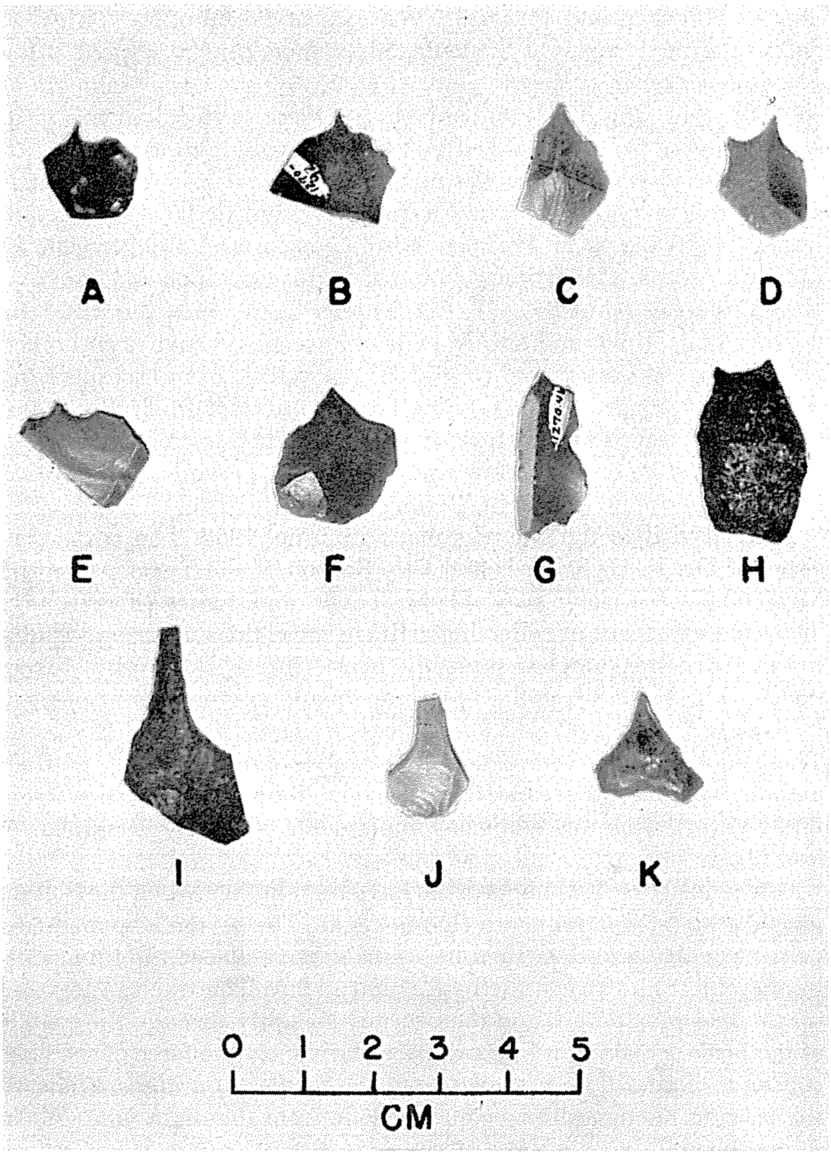

Fig. 2. Gravers from the Elida site, eastern New Mexico.

when the campsite material was laid down. The only natural water near the site today is to be found in pluvial lake beds that are dry except after heavy rains. There also must have been a shortage of

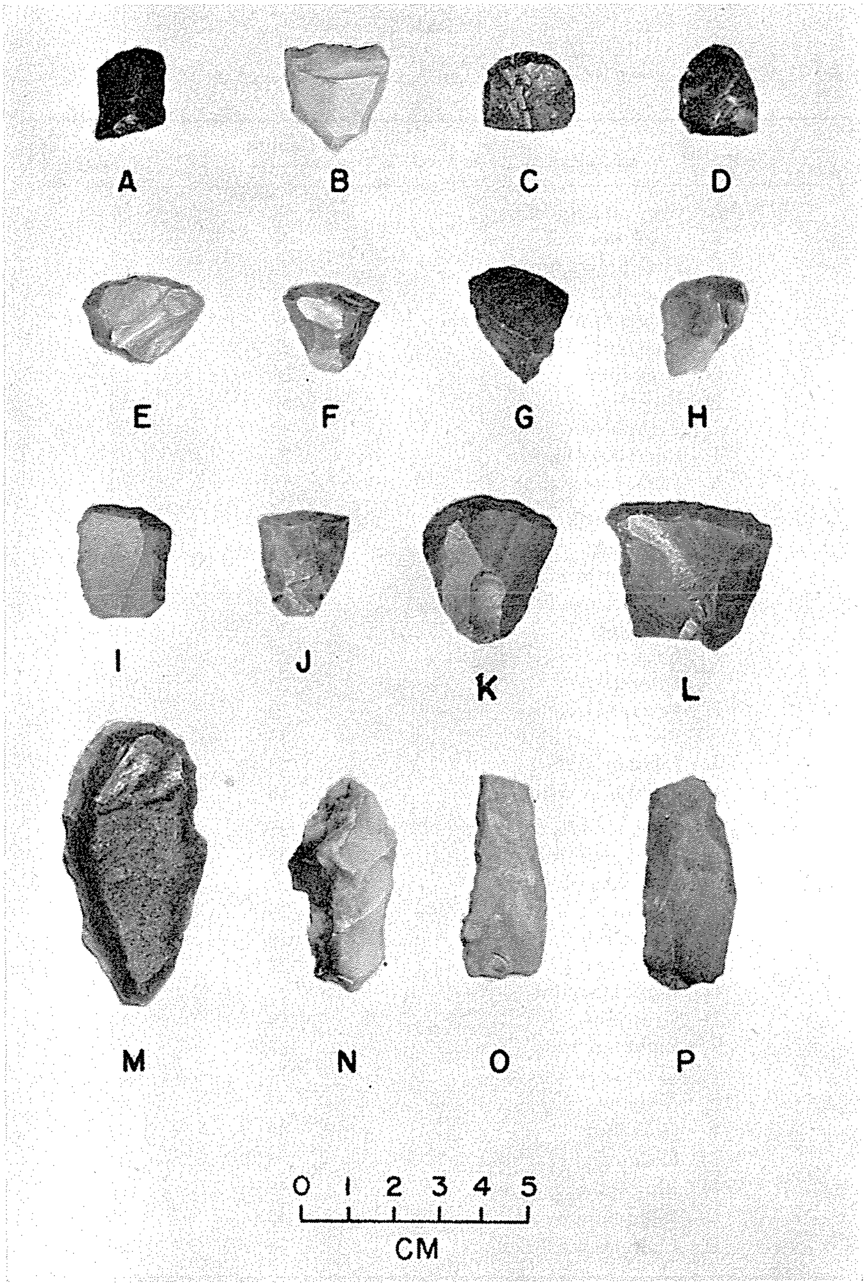

Fig. 3. Scrapers from the Elida site, eastern New Mexico. End-scrapers, A-M; side-scrapers, N-P.

TABLE 1

Measurements and Observations on Artifacts Illustrated in Figures 1–3

	Material	Length in mm.	Width in mm.
Fig. 1—A	Gray and blue flint	51	26
B	Light tan flint	30	23
C	Dark brown flint	26	19
D	Gray flint	11	11
E	Brown flint	17	17
F	Blue flint	32	32
G	Gray flint	20	16
H	Blue flint	50	25
I	Light brown flint	30	18
J	Light gray flint	25	25
K	Light brown flint	18	20
Fig. 2—A	Dark blue flint	15	24
B	Blue flint	20	16
C	Light brown flint	20	14
D	Light brown flint	16	13
E	Tan flint	20	13
F	Gray flint	25	11
G	Gray flint	20	18
H	Red mottled flint	28	17
I	Red mottled flint	33	20
J	Light gray flint	18	12
K	Light brown flint	16	16
Fig. 3—A	Dark blue flint	21	12
B	Light gray flint	24	24
C	Brown speckled flint	20	18
D	Red flint	23	18
E	Gray flint	26	20
F	Gray flint	21	18
G	Light blue flint	27	23
H	Gray flint	26	18
I	Light tan flint	27	21
J	Light gray flint	24	21
K	Tan flint	32	31
L	Gray flint	38	32
M	Cream and gray flint	65	34
N	Blue and gray flint	48	25
O	Light brown mottled flint	45	20
P	Light brown flint	48	22

local materials for artifacts, for it seems as though every piece of flint that was large enough was utilized for some purpose. Very small chips were made into gravers or flaked on one edge so as to be of some use. One channel flake (Fig. 3, A) was made into an end-scraper. The nearest available flint supply lies near the Pecos River, 45 miles to the west of the campsite.

Projectile points, with one exception, seem to be of cruder workmanship than is normally found on Folsom points. This may prove to be of significance in comparative studies.

Unfortunately the site had been exposed by wind erosion when discovered and no stratigraphy could be determined, but further investigations of the locality may yield significant stratigraphic information.

Three additional projectile points were found near the campsite but outside the area from which the Folsom points were collected. Two of these points resemble the Agate Basin type and one is a Scottsbluff point. One of the Agate Basin points is made of obsidian and has a reworked distal tip. These points, which are considered to be later than Folsom, probably represent a later occupation of the Elida locality.

Acknowledgments. The author wishes to thank D. L. Hankins for photographs of the specimens shown in Fig. 1, C, and Fig. 3, A; and Don Krieble for photographs of specimens shown in Fig. 1, I, and Fig. 2, I).

Portales, New Mexico

A Basic Annotated Bibliography to Facilitate the Identification of Vertebrate Remains from Archeological Sites

STANLEY J. OLSEN

MOST VERTEBRATE paleontologists and mammalogists have at hand various standard reference works that relate to the skeletons of the animals with which they are concerned. After using these works for many years they become as familiar to the specialist as his dictionary or word guide, and it is difficult for him to realize that many of these publications are not known to the archaeological field worker or to others who might benefit from their use. It is with this thought in mind that the following brief bibliography was compiled. Although by no means complete in itself, many of the references contain bibliographies of their own which can be pursued further if so desired.

A bibliography of this sort, in order to be of real value, must be made practical by listing publications that are available to the average worker rather than listing many papers that would be obtainable only by those few people who occupy laboratories near a more or less complete library. No attempt has been made to include old works that are not available outside of large university libraries or to cite those publications that are confined to the non-loan reference sections and hence of little value to the research worker who has need of the volume in his workroom where the comparative osteological material is housed. Flower's *An Introduction to the Osteology of the Mammalia* (1876) would fall into this last category, except for the current reprinting of this old standard handbook (Dover Publications, New York, in press), which now places it within the reach of all who would like to own it. It is hoped that in the not too distant future other "rare" reference volumes will become available due to modern methods of reprinting at a low cost.

Many of our common animals have not been described adequately in regard to their skeletons. However, a book which covers the osteology of the domestic dog can, of course, be used to separate all canids from other similar unrelated forms. This group in turn can be isolated still further into finer groupings by referring to publications (where available) that key out features of the dentitions or skeletons which are peculiar, say, to the fox, wolf, dog, etc. This same observation applies to a well-illustrated anatomical text which covers the domestic cat, which in turn can be used to separate the felids from other non-related forms.

The writer is at present working on a field and laboratory manual for the identification of mammal remains from archaeological sites. The first part of this work will cover those sites that are found in the southeastern and southwestern United States. At least sixty-four mammals will be treated in this contribution, with the bones of the post-cranial skeleton as well as the skulls being illustrated, described, and compared. The drawings will be keyed with arrows or dashed lines to indicate differentiating characters. No date has been set for the completion of this project, but it is hoped that publication will be in the not too distant future.

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Three Central Texas Aspect Sites in Hill County, Texas

JOSEPH K. LONG III

Introduction

DURING THE winter of 1957 and the spring of 1958, several Dallas and Fort Worth amateur archeologists carried out excavations at Buzzard, Little Buzzard, and Forrester "caves" (Texas quadrangle numbers 26D7-12, 26D7-14, and 26D7-15 respectively) in Hill County, Texas. Robert E. Forrester of Fort Worth did all the work on Forrester and Buzzard Caves; Loyd Harper of Dallas and the writer were the principal excavators of Little Buzzard Cave. Other excavators included Mrs. Loyd Harper, Loyd Harper, Jr., Jan Owen Harper, R. King Harris, and Lester Wilson, all of Dallas, and Isabelle Lobdell and Roy Padget of Fort Worth.

Acknowledgments

The above-mentioned excavators have been helpful in providing the writer with artifacts found and with detailed notes taken during excavation. Forrester and Harris have made helpful suggestions as to analysis of materials.

In 1947 and 1950 Dr. R. L. Stephenson of the Smithsonian Institution conducted excavations in the Whitney Reservoir. Buzzard Cave was one of the sites excavated, and the writer is grateful for comments from Dr. Stephenson on the site and its cultural analysis.

Mr. Edward B. Jelks, University of Texas research archeologist, has provided helpful criticism regarding the interpretation of the three sites and of their relations to the Archaic and Neo-American cultures of central Texas.

Dr. E. Mott Davis, University of Texas research archeologist, has corresponded with the writer constantly, giving him much-needed advice toward the preparation of this paper.

Excavation and Stratigraphy

All the earth excavated from the three shelters was sifted through screens of quarter-inch mesh.

Buzzard Cave

No attempt was made either to plot a grid system or to collect by depths at Buzzard Cave. Because the site had been badly disturbed by looters subsequent to the completion of Stephenson's work there, it appeared that close controls were unnecessary; consequently no attempt was made to record either the horizontal or vertical location of the artifacts found. No stratigraphic zoning of the deposits was observed.

At Buzzard Cave, Stephenson (1949) reported finding two triangular dart points, one dart point of the Martindale type, 30 Perdiz type arrow points, five Cliffton arrow points, seven Alba arrow points, and two arrow points identified as "Tahuaconi" type.

Little Buzzard Cave

Because of its superficial appearance, Little Buzzard Cave was originally thought to consist of a cultural layer only about three inches deep. Excavation thus proceeded to some degree before it was discovered that the deposits were of sufficient depth to warrant vertical controls. Eventually excavation was done by six-inch levels, excluding the top layer of fallen rock. Of the nine artifacts (3.0% of total artifacts) found below the upper two six-inch levels, all occurred immediately below the second six-inch level except in three cases: the two burials, occurring 18 inches below the top of the cultural layer, and a mano (Fig. 9, A) occurring 20 inches below. The only further indications of occupation at these lower levels were scattered flint flakes, river pebbles, flecks of charcoal, and snail shells (*Bulimulus* sp.).

No stratigraphic distinctions between any of the arrow point types were discerned, nor was there any vertical separation between dart points and arrow points. There are several factors that might possibly explain the failure to recognize any stratification of artifact classes or types—(1) the shallowness of the deposits, (2) the fact that vertical provenience of artifacts was not recorded during much of the excavation, and (3) irregularities in the zoning.

The coöordinate method used in excavating Little Buzzard Cave (Fig. 1) follows standard mathematical procedure (May, 1952: 113–

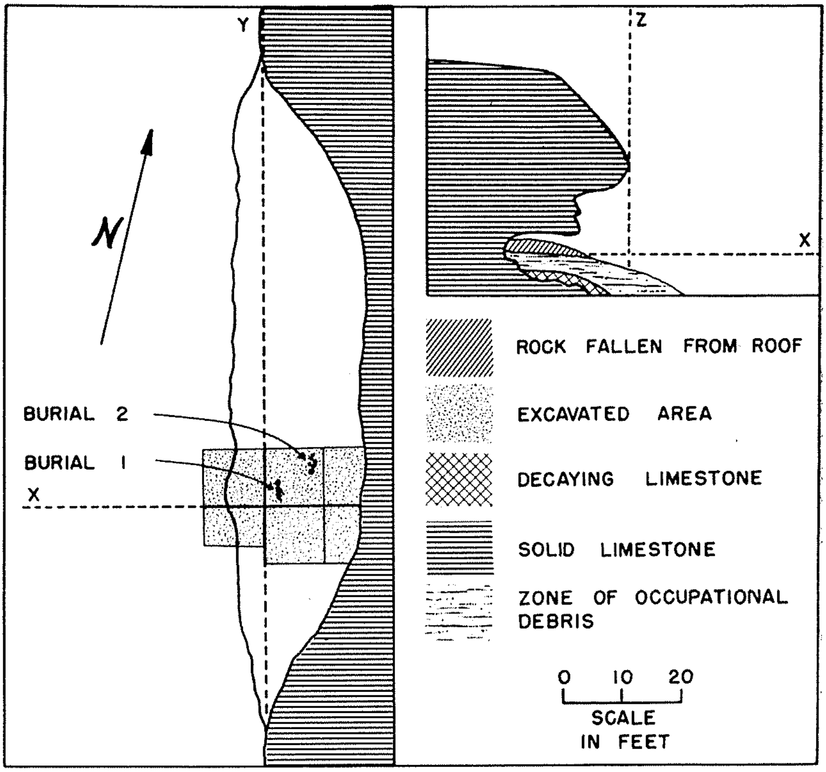

Fig 1. Little Buzzard Cave. Left, horizontal plan of cave, showing area excavated and the location of Burials 1 and 2. Right, cross-section of cave, showing stratigraphy of deposits.

117, 564–566) with datum point as indicated in Fig. 1. The thickness of the layer of rock fallen from the top as indicated in Fig. 1 is slightly exaggerated. In actuality, it averaged only three inches in thickness and was of negligible thickness in some places.

Forrester Cave

No stratigraphy was observed at Forrester Cave. Bedrock was not far beneath the surface, and the occupational layer was only 8 to 10 inches thick. The shelter was dug in the hope of obtaining human skeletal material to supplement the present scanty information on the physical type of the Central Texas Aspect peoples. Forrester Cave is a small rock shelter 14 feet in length, six feet in depth (front to rear), and with a maximum ceiling height of six feet.

Description of the Artifacts

Ceramics

Buzzard Cave

Vessel I. Fourteen sherds (Fig. 2, A) of a vessel identified as type Leon Plain were recovered. The vessel had an oral diameter of 22 ± 1 cm., and there were two suspension (?) holes 1.5 cm. below the lip. The paste is black, and the sherds indicate a wall thickness of from 4.5 to 5.5 mm.

Vessel II. Another Leon Plain vessel is represented by 17 reddish-brown sherds (Fig. 2, H), one of them pierced by a hole showing rotational drill marks. This hole was probably for crack-lacing, although it may have been a suspension hole. The sherds are all 5 to 6 mm. thick. The paste characteristics of Vessels I and II correspond to those cited for the Leon Plain type by Suhm, Krieger, and Jelks (1954: 386).

Vessel III. Five sherds of a Holly Fine Engraved vessel (Fig. 2, C, D) were found, thickness ranging from 3½ to 5 mm. Paste color is dark brown.

Vessel IV. One sherd (Fig. 2, B) is similar to those of Vessel III in texture, temper, color, and finish, but the engraved design is more typical of the Sanders Engraved type than of Holly Fine Engraved (Suhm, Krieger, and Jelks, 1954: Pls. 34, 35, 61). On the basis of surface finish and fineness of engraving, however, the sherds is tentatively designated as type Holly Fine Engraved. Oral diameter of the vessel is estimated to have been 9 ± 2 cm. The sherd is 6.5 mm. thick.

Vessel V. One sherd (Fig. 2, E) was similar in paste characteristics to the lighter-colored Holly Fine Engraved sherds. A crude attempt was made to scratch a design on the vessel after a smooth finish had been applied and the vessel had been fired. These rough scratches were later filled with ocher. The sherd is 5 mm. thick.

Vessel VI. Four sherds possibly of the Goose Creek Plain type were recovered, the identification having been made mostly on the basis of sand tempering. These sherds are all about 4 mm. thick. The writer had originally recognized the possibility that these might be Goose Creek Plain sherds but had rejected the identification because of the improbability of this coastal type being found in central Texas. Since that time, he has read Suhm's discussion (Suhm, 1957: 32) of the possibility of (1) cultural affiliation, (2) contemporaneity, and (3) intergrading of the Leon Plain and Goose Creek Plain types. She

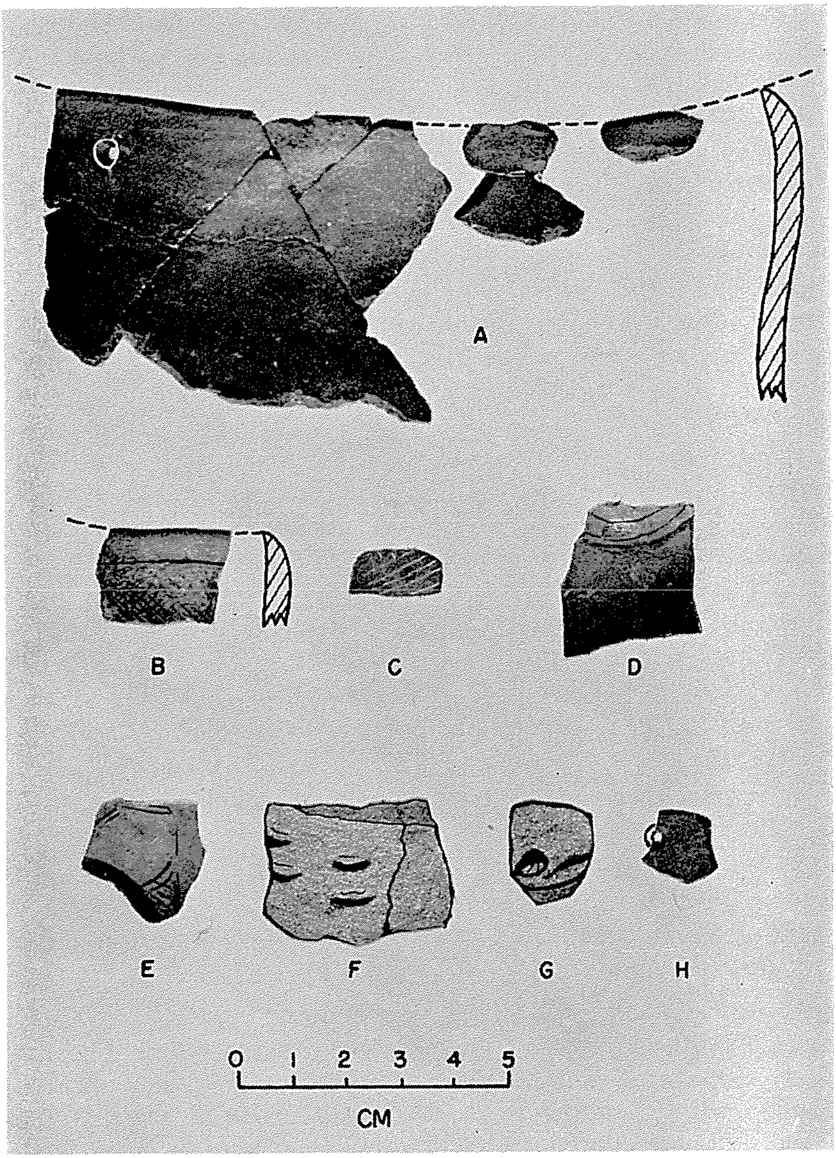

Fig. 2. Pottery from Buzzard Cave. A, Vessel I, type Leon Plain; B, Vessel IV, type Holly Fine Engraved; C-D, Vessel III, type Holly Fine Engraved; E, Vessel V, type Holly Fine Engraved; F, Vessel VII, type Dunkin Incised; G, Vessel VIII, type Dunkin Incised.

pointed out that the Galveston Bay Focus (of which Goose Creek Plain is considered diagnostic) shares arrow point types and other traits with the Central Texas Aspect. Similar sandy-textured sherds reported at the Blum Rockshelter (Jelks, 1953: 205) were also associated with the Central Texas Aspect.

Vessel VII. One sherd (Fig. 2, F), 7 mm. in thickness, has been identified as type Dunkin Incised (Suhm, Krieger, and Jelks, 1954: 268–269).

Vessel VIII. One sherd (Fig. 3, G) of a second Dunkin Incised vessel was recovered. This sherd is 8 mm. thick. R. K. Harris, who has examined the sherds, thinks that Vessels VII and VIII might possibly both be of the Weches Fingernail Impressed type (Suhm, Krieger, and Jelks, 1954: 364–365).

Little Buzzard Cave

Vessel I. The two sherds of this vessel were tentatively identified as Holly Fine Engraved on the basis of collective paste characteristics, although no engraving was present. Thickness is 5.5 to 6.5 mm.

Vessel II. This is tentatively identified as Sanders Engraved on the basis of paste, carinated vessel form, and an engraved line (Fig. 5, H) on the one sherd recovered. These characteristics agree with the type description in *An Introductory Handbook of Texas Archeology* (Suhm, Krieger, and Jelks, 1954: 352–353).

Vessel III. One sherd, 7 to 8 mm. thick, is identified as type Goose Creek Plain.

Vessel IV. Three sherds (Fig. 5, J, note differential firing), 5 to 8 mm. thick, were identified as Goose Creek Plain.

Vessel V. One sherd (Fig. 5, I), 6 to 8 mm. thick, is probably Holly Fine Engraved.

Vessel VI. One sherd with grit and bone temper is eroded beyond identification. It is 3 to 4 mm. thick.

Discussion. No pottery was found at Forrester Cave. The sherds recovered and identified from the other two sites seem to indicate four possible sources of pottery: (1) locally made wares, represented by Leon Plain (and possibly by Goose Creek Plain); (2) Galveston Bay Focus trade from the Texas coastal area as indicated by Goose Creek Plain pottery; (3) trade with Alto (or possibly Gahagan) Focus from east Texas as indicated by Holly Fine Engraved, Dunkin Incised, and/or Weches Fingernail Impressed; (4) Sanders Focus trade from the Red River area of northeastern Texas as indicated by a single sherd tentatively identified as Sanders Engraved.

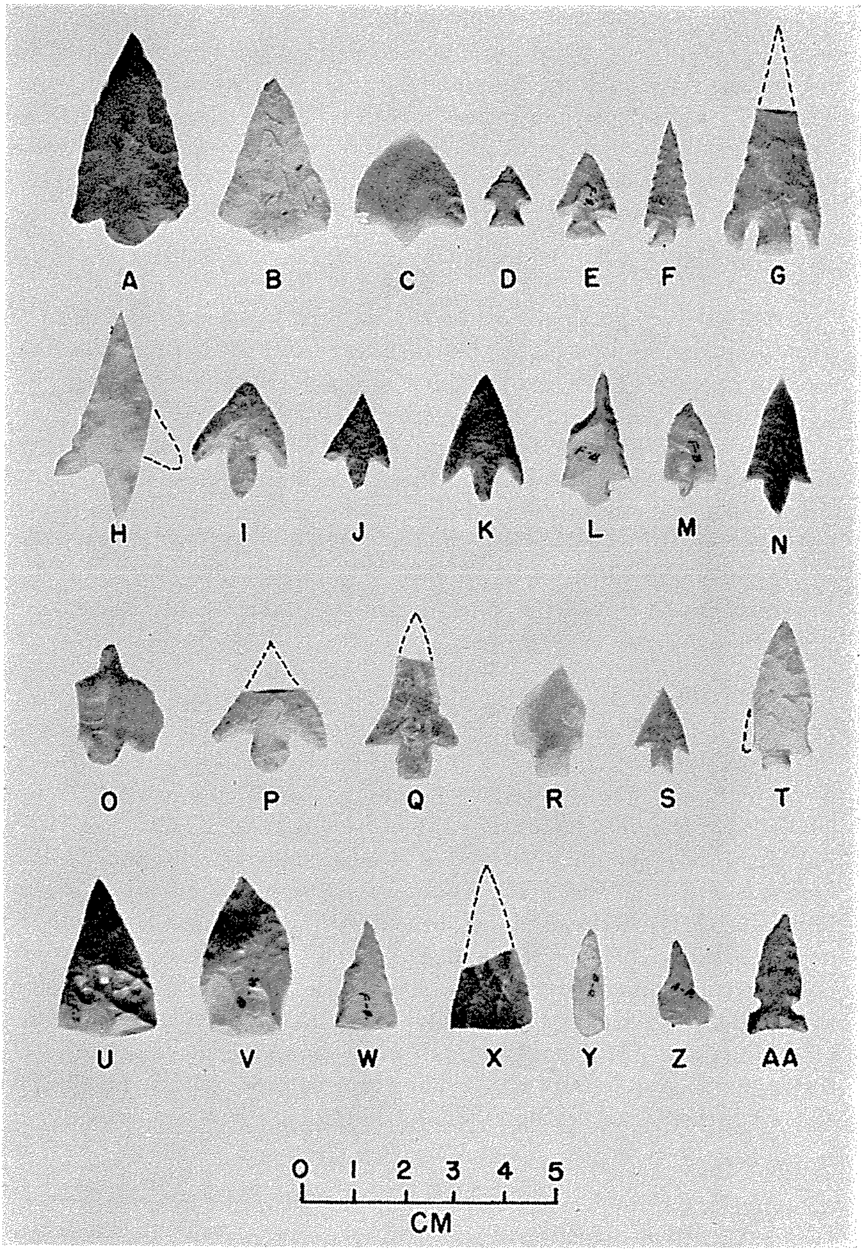

Fig. 3. Arrow points from Buzzard Cave. A-C, Cliffton; D-G, Scallorn; H-N, Perdiz; O-R, Alba; S-T, Cuney; U-V, Young; W-X, Fresno; Y-Z, serrated flake scrapers; AA, Washita.

Arrow Points

Arrow points were the most numerous class of artifacts found at each of the three shelters. The identification of arrow point types was based on the descriptive criteria set forth by Suhm, Krieger, and Jelks (1954), except in the case of the Reed and Washita types, which were identified on the basis of type descriptions in *Guide to the Identification of Certain American Indian Projectile Points* (Bell, 1958).

Perdiz Type

A total of 133 specimens of the Perdiz type was found at the three sites, their distribution being: Buzzard Cave, 87; Little Buzzard Cave, 44; and Forrester Cave, two. These points conform to the type description of Suhm, Krieger, and Jelks (1954: 504–505).

At the Smith Rockshelter, Suhm (1957: 35) recognized eight variants of the Perdiz type. Since all the variants were concentrated in a single zone at the Smith Site, probably they all should be regarded as a single type. The shelters reported herein produced similar varieties with the possible inclusion of another (Fig. 3, L, M; Fig. 7, I; Fig. 12, J) which has been referred to as the "Foyle Flake" point (Miller and Jelks, 1952: 177–178).

Scallorn Type

Scallorn points from the three sites total 84. There are 32 from Buzzard Cave, 38 from Little Buzzard Cave, and 14 from Forrester Cave. The writer found several variations within the Scallorn type. One variety is a very small side-notched form (Fig. 3, D, E; Fig. 7, R; Fig. 12, B, E). Another variety is large, crudely made, and basally notched (Fig. 3, G; Fig. 7, P). Another is a well-made, basally notched form (Fig. 7, Q). Some are long, thin, and serrated (Fig. 12, A); others have markedly concave blade edges (Fig. 12, G). The rest are intermediate corner-notched varieties. Again, there was no basis for separation of these variations into distinct types, since they all seem to be gradations and are apparently culturally homologous. The ratios of corner-notched to basally notched Scallorn points are 25-6, 25-14, and 12-2 at Buzzard, Little Buzzard, and Forrester Caves respectively.

Cliffton Type

Fourteen Cliffton points were found at Buzzard Cave, eight were found at Little Buzzard Cave, and two were recovered from Forrester Cave. Suhm (1957) has suggested that Cliffton may be a variety of the Perdiz type. This observation was borne out by the writer's findings in Hill County. His classification of certain arrow points as Cliffton (Fig. 3, A, B, C; Fig. 7, A, B; Fig. 12, H, I) was completely arbitrary. He simply felt that the examples so classed were either slight deviations from the norm or were unfinished Perdiz points. The classification of Cliffton as Perdiz would not significantly change the percentage ratios of Scallorn to Perdiz except at Forrester Cave, where the number of Perdiz would be doubled. In certain cases, Young points resemble the Cliffton type, being distinguishable only on the basis of chipping technique (Fig. 12, P, Q).

Alba Type

Of 19 Alba points, six came from Buzzard Cave, five from Little Buzzard Cave, and eight from Forrester Cave. It was observed that the specimens called Alba here (Fig. 3, O-R; Fig. 7, N, O; Fig. 12, K-M) may be varieties of the Perdiz type. Suhm (1957: 36) has suggested the name "Eddy" for similar points. She saw a possibility that Eddy may be a link between the Scallorn and Perdiz types and the respective foci with which they are identified. Since the writer is unable to distinguish between the Eddy and Alba types, he has chosen to use the more familiar term "Alba." In at least one case, the Alba type seems to grade into the Bonham type (Fig. 12, M).

Fresno Type

Fourteen Fresno points were found, nine at Buzzard Cave (Fig. 3, W-X), and five at Little Buzzard Cave (Fig. 1, C-D). No Fresno points were found at Forrester Cave.

Young Type

Thirty-two Young points were distributed among the three sites as follows: Buzzard Cave, 15 (Fig. 3, U-V); Little Buzzard Cave, 12 (Fig. 7, E-F); Forrester Cave, 5 (Fig. 12, P-R).

Cuney Type

Two arrow points of the Cuney type were recovered from Buzzard Cave (Fig. 3, S-T).

Washita Type

The single Washita type arrow point was found at Buzzard Cave (Fig. 3, AA). It is pitch-stained.

Reed Type

The two Reed points both came from Little Buzzard Cave (Fig. 7, L-M). Bell (1958: 76) associates the Reed type with both the Gibson and Fulton Aspects in the Caddoan Area.

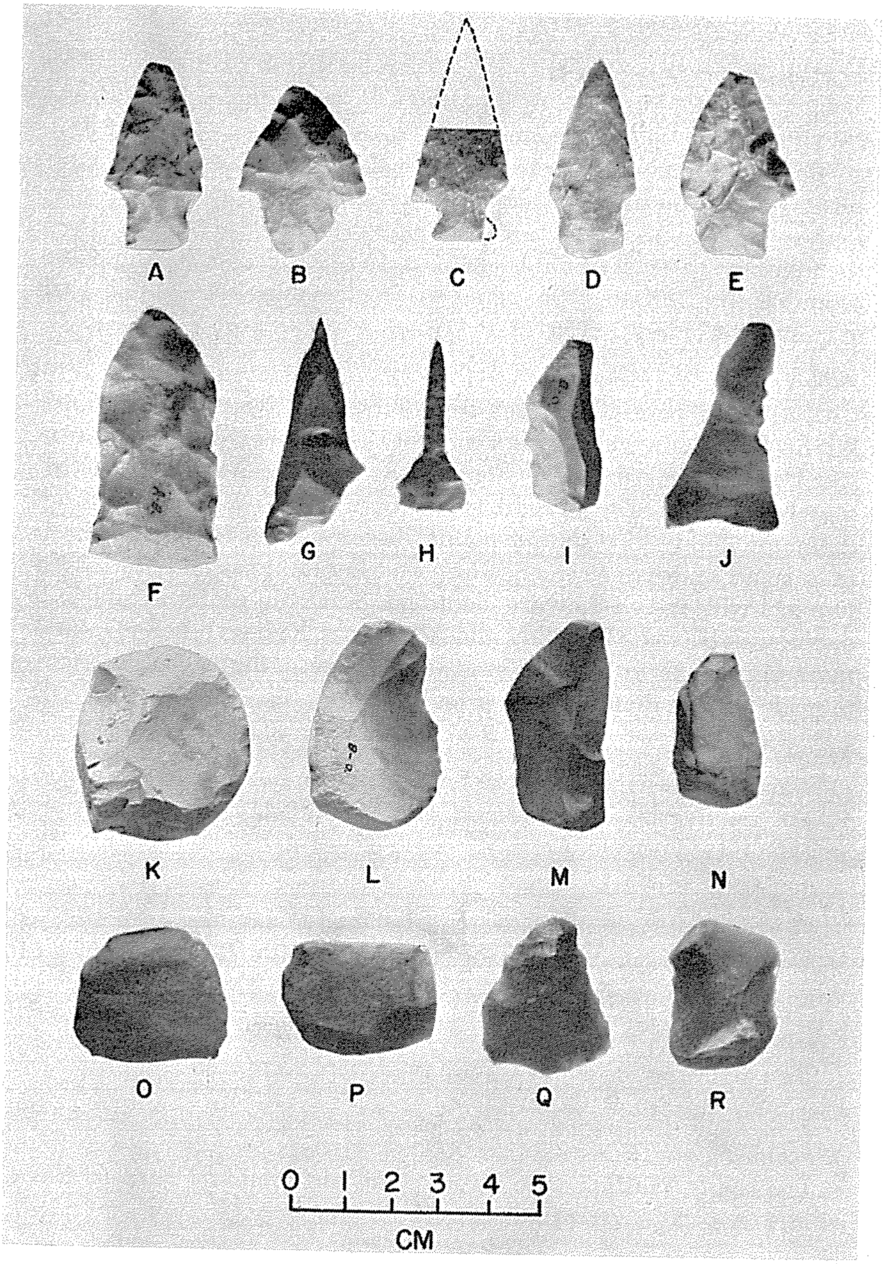

Fig. 4. Chipped stone artifacts from Buzzard Cave. A, Carrollton dart point; B, Gary dart point; C, Yarbrough dart point; D, Palmillas dart point; E, Pedernales dart point; F, Type II blade; G-H, drills with unworked bases; I-J, spokeshaves; K-M, O-R, side scrapers; N, snub-nosed scraper.

Discussion

The percentage ratios of Perdiz to Scallorn were 54-46, 73-27, and 37-63 for Little Buzzard, Buzzard, and Forrester Caves, respectively. Assuming diagnostic trait values for Scallorn and Perdiz points, it can be stated that Little Buzzard is of a conglomerate culture, that Forrester represents predominately a Scallorn type culture, and that Buzzard Cave was occupied principally by peoples who favored the Perdiz type arrow point. There may be significance in the fact that, whereas Alba points represent a negligible percentage when compared to Scallorn and Perdiz at Buzzard and Little Buzzard Caves, they represent a third of this total at Forrester Cave. Although the percentages mathematically indicate an association of Alba and Scallorn points at Forrester Cave, the small number of arrow points found there is not sufficient for statistical reliability.

Miller and Jelks (1952: 209) have pointed out that three Perdiz points and two Cliffton points were found at the Davis Site, all in levels which contained Alto Focus material—thus suggesting contemporaneity of the Perdiz and Cliffton types with the Alto Focus. However, one of the Perdiz points at the Davis Site was found in the plow zone, two Perdiz and one Cliffton were found directly beneath the plow zone, and only one Cliffton, "possibly within the range of Alba Barbed also," was found in tight association with Alto Focus material (Newell and Krieger, 1949: Table 18). Thus the question of whether the Alto Focus was coeval with—or earlier than—the Perdiz arrow point is still unanswered.

Washita points in Texas are estimated by Suhm, Krieger, and Jelks (1954: 500) to date between 1100 and 1500 A.D., although they note that the type may occur earlier outside Texas. Thus both types are considered by Suhm, Krieger, and Jelks to be later than the estimated date for Alto Focus of somewhere between 500 and 1000 A.D. (Suhm, Krieger, and Jelks, 1954: 166). The Cuney point is generally considered to date after 1600 A.D. (Suhm, Krieger, and Jelks, 1954: 498), which would eliminate the possibility of its association with Alto Focus pottery types according to accepted chronological concepts. Since no stratigraphy was observed at Buzzard Cave, the Cuney and Washita points found there cannot be related with assurance to the Alto Focus pottery also found there. But the possibility that all was left by the same group of people remains. If future research should demonstrate an association between Alto Focus pottery and the Cuney and Washita arrow point types, then an earlier date would be indicated for Cuney and Washita than has previously been proposed.

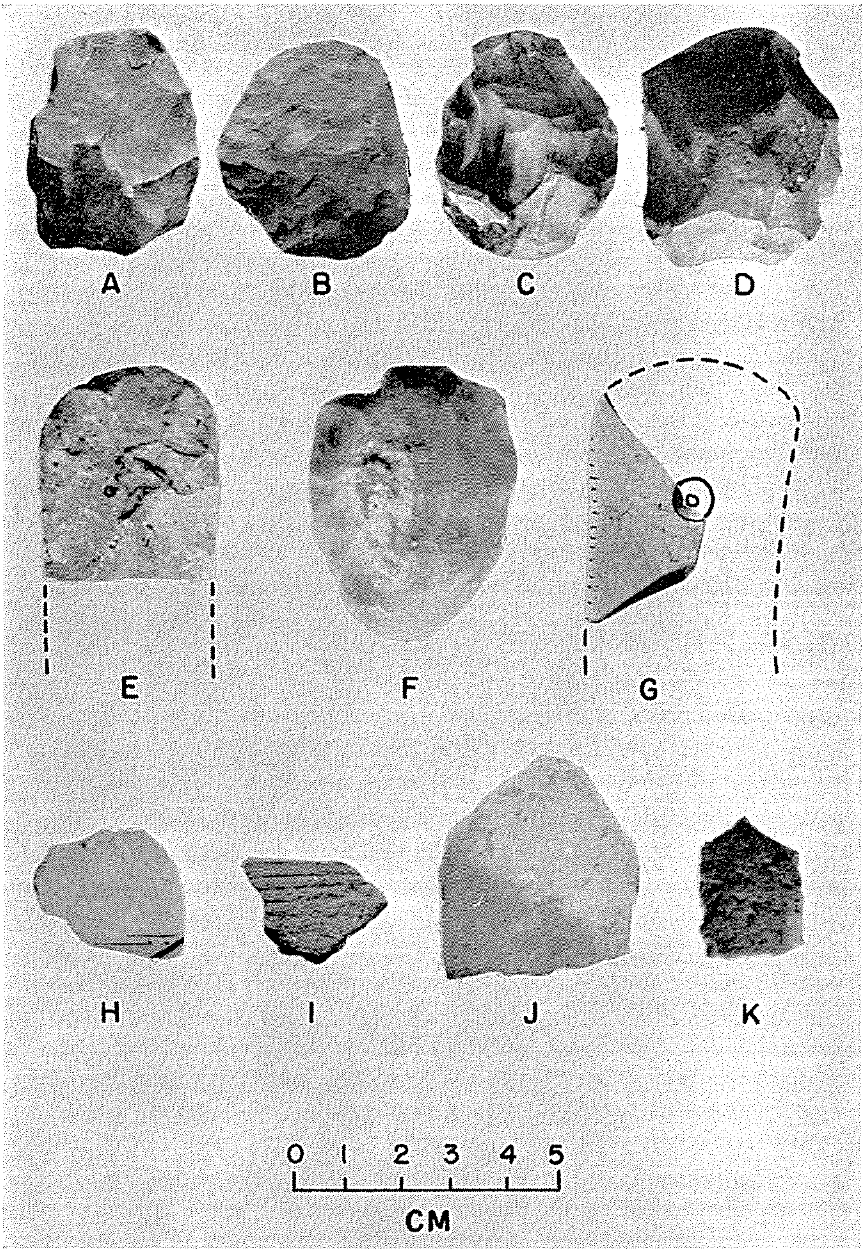

Fig. 5. Chipped stone artifacts, polished stone artifacts, and pottery from Little Buzzard Cave. A-D, scrapers; E-F, celt-like blades; G, gorget fragment; H, Vessel II, type Sanders Engraved; I, Vessel V, type Holly Fine Engraved; J, Vessel IV, type Goose Creek Plain; K, graver.

It is interesting to note that some of the arrow point forms are similar in outline to some of the dart point forms and perhaps could have been copied directly from them (cf. Fig. 7, Q with Fig. 6, G; Fig. 3, S with Fig. 6, J).

Dart Points

Palmillas Type

The most prevalent dart point type was Palmillas, represented by 15 examples from Little Buzzard Cave and two from Buzzard Cave. Were it not for the fact that two of these specimens (Fig. 7, Y, Z) were reworked some time after the time of the original manufacture, as revealed by differences in patination, it would be assumed that they in all cases were made by Central Texas Aspect people. Most examples (Fig. 6, A-D) are, however, unpatinated. It is assumed, therefore, that Palmillas points at these sites represent both specimens picked up off earlier sites and specimens made on the sites. It is considered to be a survival from the Edwards Plateau Aspect; such a survival has been considered before (Suhm, Krieger, and Jelks, 1954: 462).

Yarbrough Type

The second most common dart point type was Yarbrough. One was found at Buzzard Cave (Fig. 4, C) and 11 (six of them with beveled blades) at Little Buzzard Cave (Fig. 6, K-M). These fall into two groups, one group made of a foreign material and having patination in evidence, the other group made of native unpatinated chert river pebbles. The survival of the Yarbrough type into the Central Texas Aspect has been suggested (Suhm, Krieger, and Jelks, 1954: 492). These excavations indicate the validity of the suggestion.

Other Dart Points

In addition to Palmillas and Yarbrough, several other types of dart points were recovered, all of them occurring in very small quantities. Two Gary points, three Darl, one Williams, one Kent, three Pandora, one Wells, three Bulverde, two Pedernales, two Carrollton, and one Ensor were found. For provenience data on these dart points see Table 1.

It has been suggested that there is a marked similarity between Yarbrough and Darl points (Suhm, Krieger, and Jelks, 1954: 492). The single Darl point found at Little Buzzard Cave (Fig. 6, N) is a poor example made of native unpatinated material. It bears only slight resemblance to the Yarbrough type. The two Darl points from Forrester Cave (Fig. 12, N, O) are of a foreign material, are patinated, and

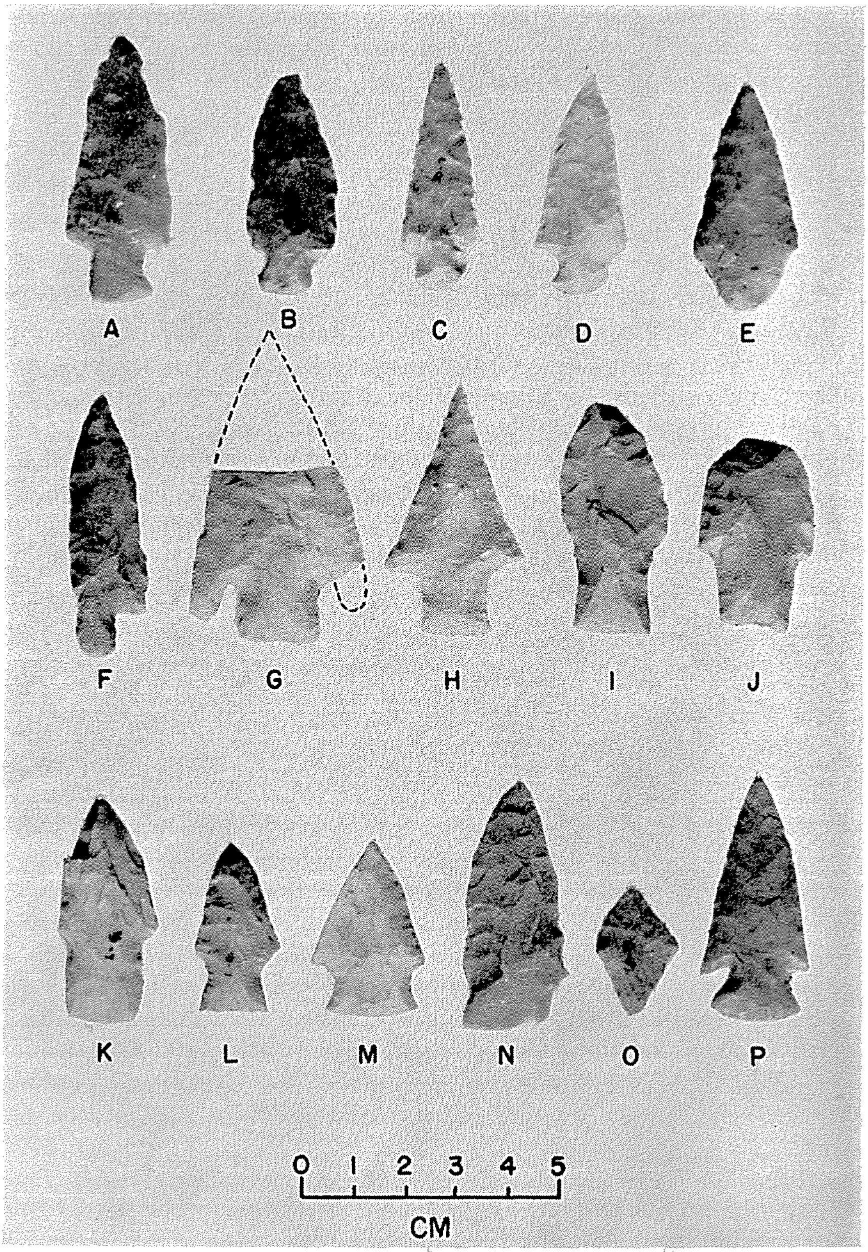

Fig. 6. Dart points from Little Buzzard Cave. A-D, Palmillas; E, Gary; F, Kent; G-I, Bulverde; J, Pedernales; K-M, Yarbrough; N, Darl; O, Wells; P, Williams.

resemble some patinated specimens of the Yarbrough type from Little Buzzard Cave (Fig. 6, L). At the Collins Site, both Darl and Ensor dart points were found in Central Texas Aspect levels (Suhm, 1955: 30). Thus the evidence suggests that Darl probably represents a carry-over trait from the Edwards Plateau Aspect into the Central Texas Aspect.

With the exception of one Kent point (Fig. 6, F), all other dart points are patinated. Several of these (notably the Pandora, Fig. 8, K) were identified as being of a distinct type of chert found in Coryell County, Texas (Forrester, personal communication). Several dart points have been reworked, judging from condition of patination and/or smoothness on some surfaces (Fig. 6, I, J, O; Fig. 7, Y, Z; Fig. 8, L). Suhm recognized a complex system of the picking up of earlier points by Central Texas Aspect people and their manufacturing of similar points. This has been indicated by many past excavations and is becoming increasingly evident as work proceeds. In regard to this, the writer observed that, as a rule, patinated dart points of foreign materials are generally of better workmanship than the rough-surfaced, unpatinated points. Harris (personal communication) has observed that dart points associated with later cultures of north-central Texas generally tend to be smaller within a given type. Jelks (personal communication) says: "Historical records indicate that most Indian tribes were using spears in addition to the bow and arrow at the time of contact with Europeans. This includes tribes of Central Texas. If they were using spears, it is logical to suppose that at least some of them had stone points, and since arrow points are too small for effective use on spears, it is reasonable to assume that the spear points were in the size range of Edwards Plateau Aspect dart points."

In summary, it may be stated that the Central Texas Aspect people probably obtained dart points by (1) manufacture, (2) by collecting from "extinct" Edwards Plateau Aspect sites (in some cases beneath their own), and possibly (3) by trade with late-surviving Edwards Plateau Aspect tribes. Darl, Palmillas, Yarbrough, Ensor, Ellis, and Kent dart point types may have been manufactured in Central Texas Aspect times.

Chipped Stone Blades

Type I Blades

From Little Buzzard and Forrester shelters there were respectively 41 and two examples of crude blades with rounded bases and no secondary chipping (Fig. 12, V, W). These might be classified as either

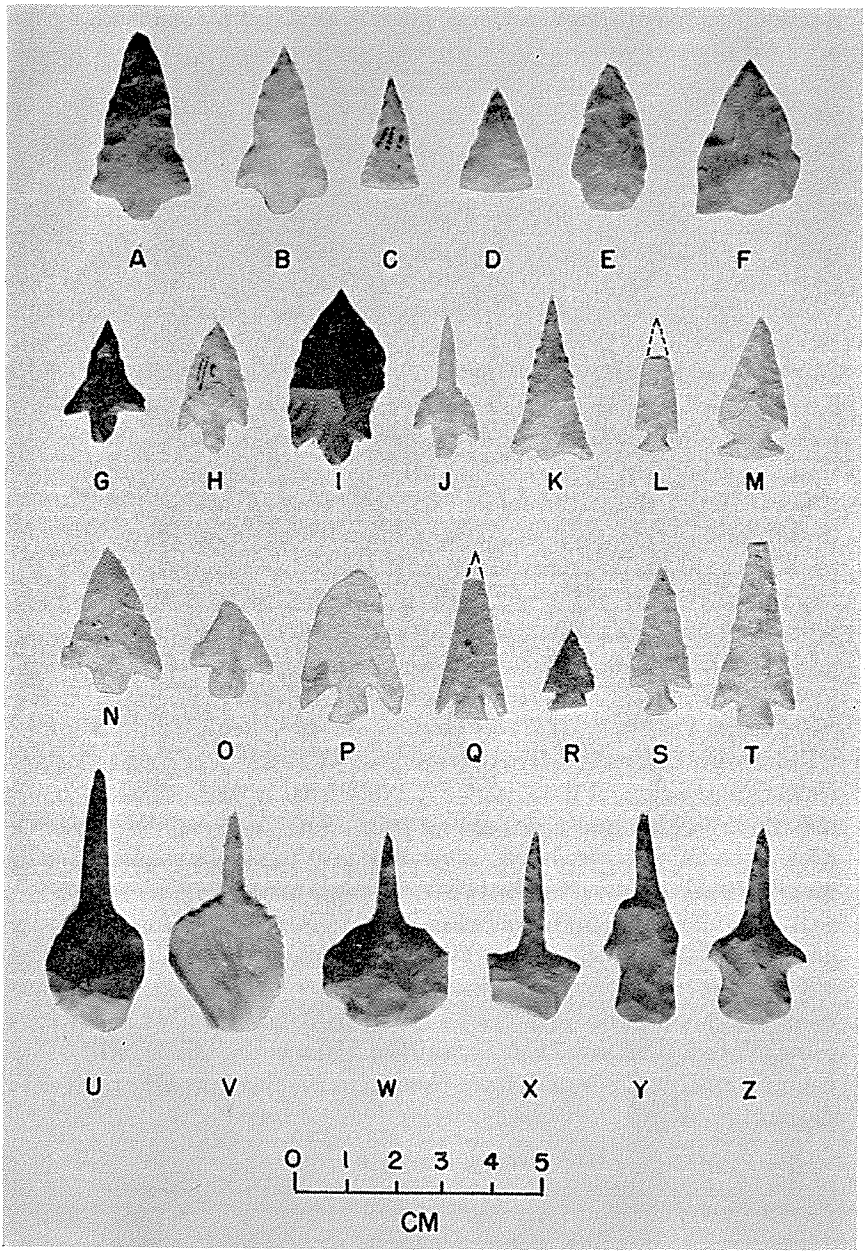

Fig. 7. Arrow points and drills from Little Buzzard Cave. A-B, Cliffton; C-D, Fresno; E-F, Young; G-K, Perdiz; L-M, Reed; N-O, Alba; P-T, Scallorn; U, drill base unworked; V, drill, base serrated; W, drill, large squared base; X, drill, small squared bases; Y-Z, drills, reworked Palmillas points.

knives, dart points, or blanks—or even, if it were not for their extreme crudeness, as Refugio type dart points. They are herein classed as Type I blades.

Type II Blades

Thirty-six thin blades with square bases and with some secondary chipping were recovered (Fig. 8, A-D, H), 12 examples having been found at each of the three sites. These might be classified as Pandora points were it not for their crudeness and asymmetry. They are assumed to be knives, but are given the classification of Type II blades.

Type III Blades

Twenty-one bifacial implements (Fig. 8, E-G; Fig. 12, U) were designated Type III blades. Six came from Buzzard Cave, 14 from Little Buzzard Cave, and one from Forrester Cave.

Type IV Blades

Three very thin, well-worked blades with serrated edges are here labeled Type IV blades (Fig. 8, I-J). Two of them are asymmetrical and therefore it is assumed that they are knives. R. King Harris called the writer's attention to the fact that these specimens are similar to others found in central Texas and called "Copena knives." With some research, the writer found that these are actually poor examples of a kind of artifact found at Belton Reservoir by Miller and Jelks (1952: 181, Pl. 26) and called by them Copena knives. The first reference to this type in central Texas was probably that which mentioned the occurrence of Copena knives in the non-pottery Round Rock Focus of the Edwards Plateau Aspect in Coryell County (Kelley, 1947a). The writer questioned this classification on the grounds that the great majority of specimens were widely divergent from those generally accepted as "classics" of the Copena culture of the eastern United States (Lewis and Kneberg, 1954: 126; Webb and DeJarnette, 1942: 301–306). He later found that near-classic examples had been found at the Davis Site (Newell and Krieger, 1949: 173–175) and that a few examples of a certain type found at the Gahagan Mound were near-classic Copena knives (Webb and Dodd, 1939: Pl. 27, Panel 1). Since that time, he has found many examples of the general type represented by the range at Gahagan, both in collections and in illustrations in literature (although there are few references to their being Copena type blades). It was found that the range includes Copena points, Kinney points,* points such as were found at Little Buzzard Cave,

* Recently Robert Forrester excavated a Central Texas Aspect burial in the vicinity of the Buzzard Cave group of shelters. The burial contained three of the type under discussion, one having a deeply-concave base, making it a near-classic Kinney point.

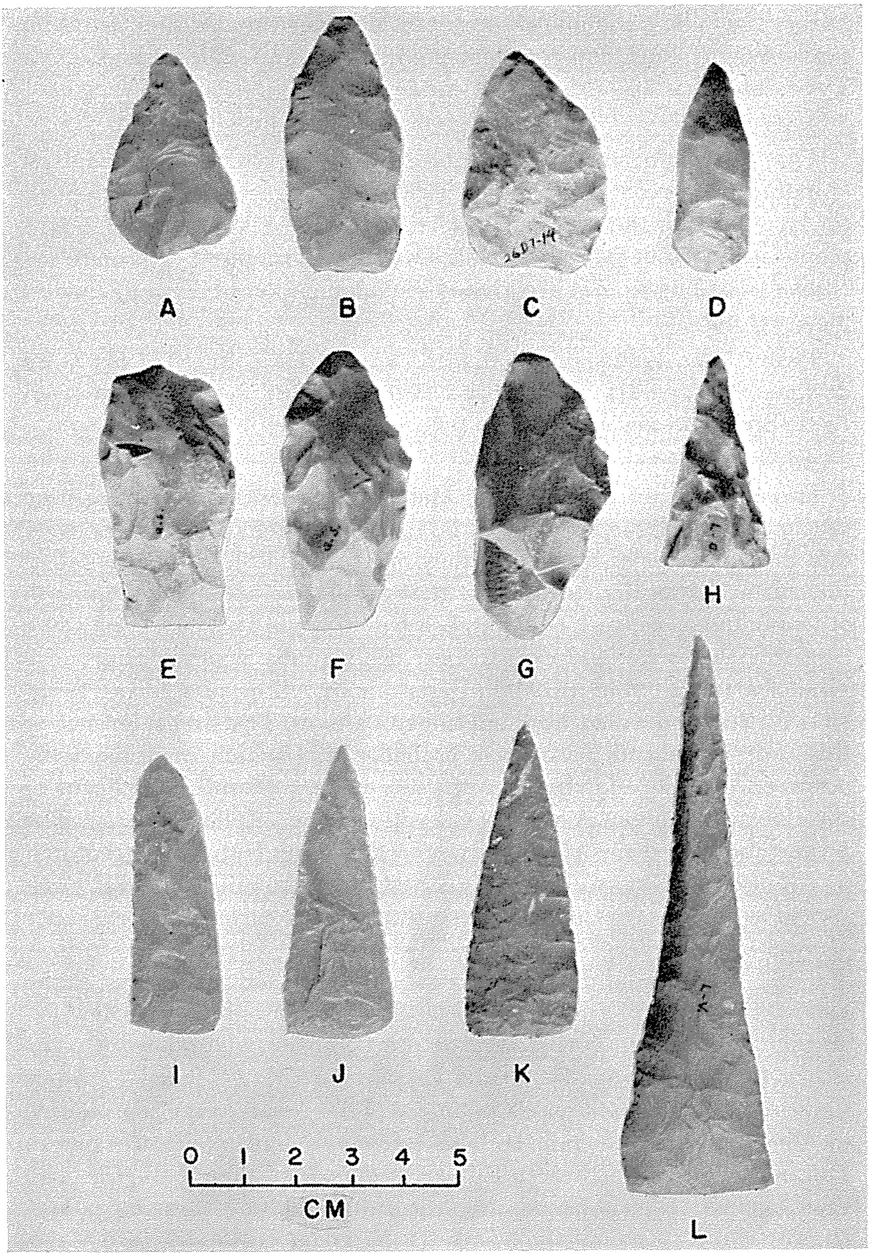

Fig. 8. Blades from Little Buzzard Cave. A-D, H, Type II blades; E-G, Type III blades; I-J, Type IV blades; K-L, Pandora points.

Pandora points in a few cases, and in one case a blade made into a corner-tang knife.† Krieger seems to be of the opinion that the Copena point of the eastern states might just as easily have been "borrowed" from the Gahagan-Davis culture(s) as the reverse case (Newell and Krieger, 1949: 174). The general consensus seems to be that this type spread from east to west. Considering the reported association with Round Rock Focus and corner-tang knives, the writer can find no positive evidence concerning the direction of diffusion, although he does strongly suspect that this type diffused over a wide area.

It has been observed that, in contrast to the classic examples of Copena points (Webb and DeJarnette, 1942: 301–306; Lewis and Kneberg, 1954: 126; and the writer's personal observation of the collection of point types assembled by Robert E. Bell, University of Oklahoma), similar western forms have a wider range of variation, are thinner, are in many instances serrated, and, in some cases, are nearly three times as long as classic Copenas.‡

On the basis of this evidence the writer draws the following conclusions: (1) Copena-like knives had a pre-pottery appearance both in the eastern United States and in Texas;§ (2) on the basis of findings thus far, Texas varieties cannot be definitely assigned to any particular culture; (3) the term "Copena" should be dropped from the classification of western types in most cases; (4) the western types should not be classified by names until further investigation and subsequent division can be made. Bell (personal communication) supported these conclusions in stating to the writer that he felt that "none of the varieties so-called in Texas are true Copena points."

Miscellaneous Chipped Stone Implements

In this category are included gravers (Fig. 5, K); crude scrapers, choppers, and/or cores (Fig. 5, A-D); crude celts or adzes (Fig. 5, E, F; Fig. 12, T); spokeshaves (Fig. 4, I, J); side scrapers (Fig. 4, K-M, O-R); snub-nosed scrapers (Fig. 4, N); and serrated flake scrapers (Fig. 3, Y, Z). All are of the usual forms found in the region and they are considered to have only slight diagnostic value. Several of the drills

† The writer recently observed such a knife among corner-tang knives from western Texas in the collection of Robert Forrester.

‡ Texas size!

§ At least part of the Copena culture appears to be pre-pottery.

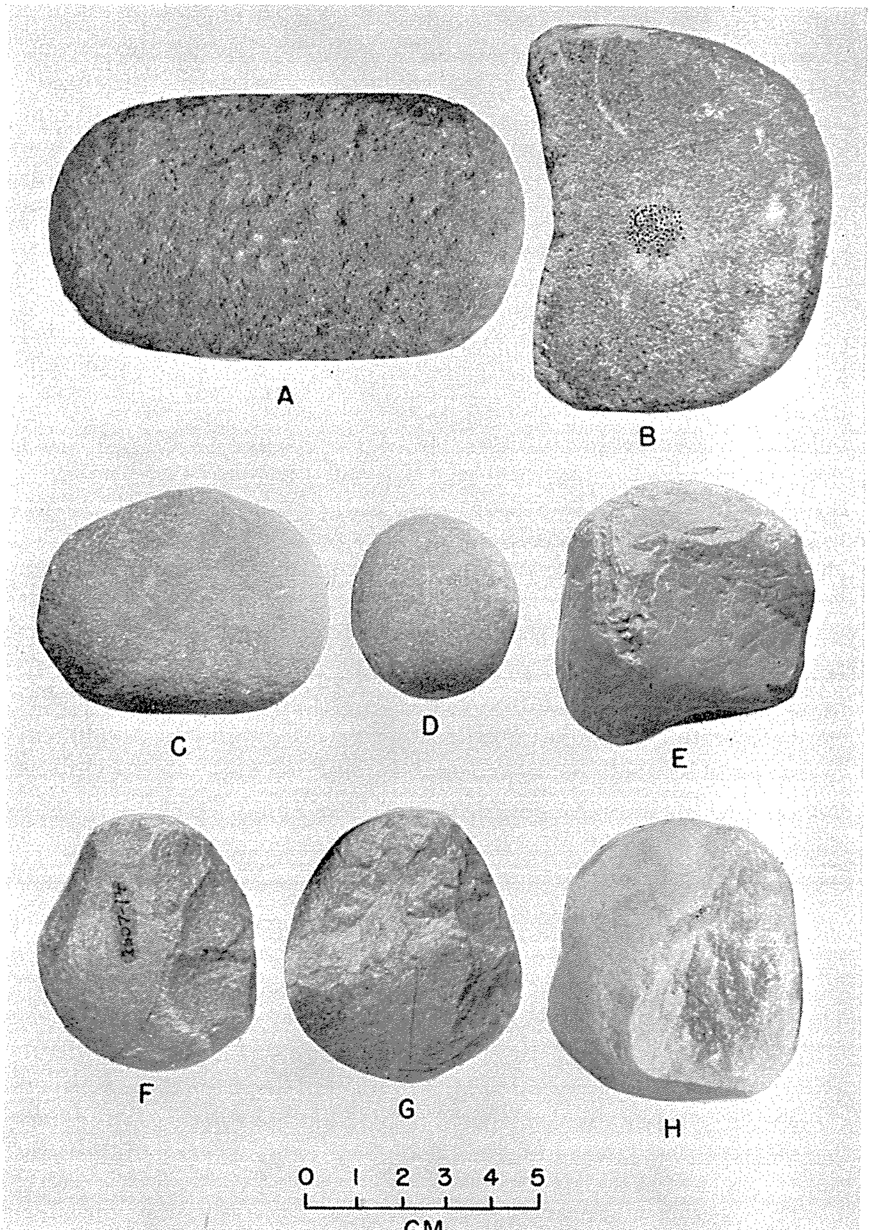

Fig. 9. Ground and pecked stone artifacts from Little Buzzard Cave. A, subrectangular mano; B, pitted mano; C-D, cooking pebbles (?); E-H, hammerstones.

were worked from arrow or dart points (Fig. 3, L, O; Fig. 7, J, Y, Z). Other drill forms have unworked bases (Fig. 7, U; Fig. 4, G, H), serrated bases (Fig. 7, V), large squared bases (Fig. 7, W), or small squared bases (Fig. 7, X).

Pecked, Ground and Battered Stone

This classification includes crude sandstone and limestone hammerstones, flint and quartzite hammerstones (Fig. 9, E-H), quartzite river pebbles (for stone boiling?) (Fig. 9, C, D), subrectangular manos with flat, parallel faces (Fig. 9, A), and irregular manos with a pit on one face (Fig. 9, B).

Polished Stone

A fragment of a polished, fine-grained limestone gorget with a hole and side notches (Fig. 5, G) was recovered at a depth of about one foot in Little Buzzard Cave. The limestone is apparently not of local origin.

Minerals

A single crystal of gypsum from Little Buzzard Cave was the only unusual mineral specimen recovered.

Artifacts of Bone and Antler

Antler flakers (Fig. 10, F-I), deer ulna awls of flaking tools (Fig. 10, J-M), long bone perforators (Fig. 10, C), a perforator made from the dorsal spine of a catfish (Fig. 10, D), and a bone fishhook (Fig. 11) were recovered. One antler flaker had been sawed in half and broken (Fig. 10, E); in another case, one was chopped on and then broken through, indicating that in at least some cases, these implements were not worn down by use, but rather were sawed or chopped off before use.

Artifacts of Shell

Two perforated shells (*Amblema*), perhaps used as net sinkers, were recovered from Little Buzzard Cave. The holes were made by battering, rather than by drilling (Fig. 10, A, B).

Thousands of snail shells (*Bulimulus*) were found throughout the shelter, about 4% of them perforated. Perforated snail shells strung into a necklace were found in a shelter in Val Verde County, Texas, by Pearce and Jackson (1933: 119). Despite the similarity of the perfo-

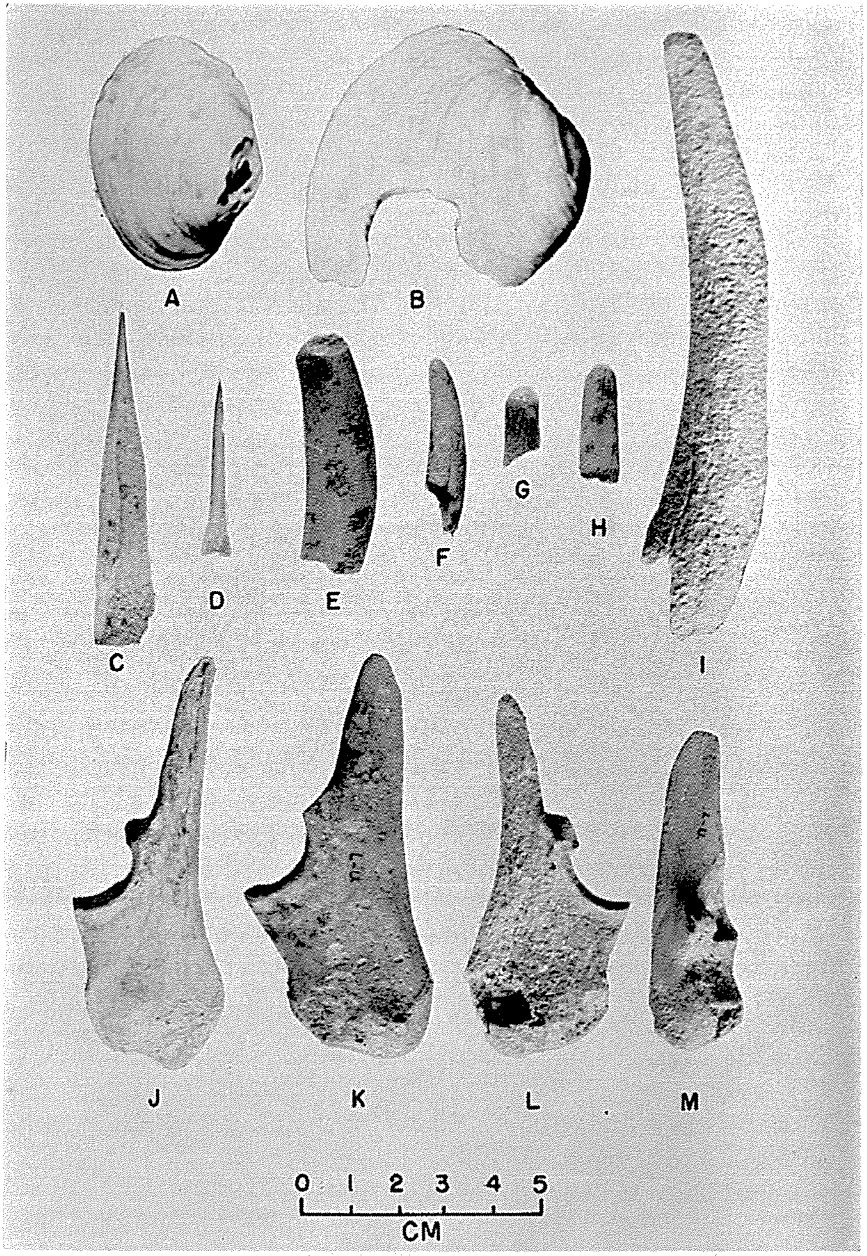

Fig. 10. Shell and bone artifacts from Little Buzzard Cave. A-B, perforated mussel shells; C, long bone perforator; D, perforator made of catfish dorsal spine; E, cut, but unused, antler flaking tool; F-I, antler flaking tools; J-M, deer ulna awls or flaking tools.

rated snail shells at the Hill County shelters to those from Val Verde County, there is no evidence that they were used here for necklaces. Snails which had died naturally and had accumulated at the interface of the cultural and rock fall layers were perforated in the same percentages as those found throughout the midden.

Burials

Only two burials were found, both at Little Buzzard Cave (see Fig. 1).

Burial 1

The absolute depth of the skeleton was 24 inches; height above bedrock was 6 inches. No burial pit was in evidence, nor were there any stones in association. The body was flexed on the right side with skull facing south. The jaw was open. The right hand and arm were near the head; the left hand and arm were near the thigh. The left leg and foot were flexed, but the right leg and foot were missing. A Scallorn point was behind the left knee, and a Fresno point lay behind the skull. The cephalic index is 76.0, and the estimated age was 8 or 9 years. Data on this burial were taken from notes made by the excavator, Robert E. Forrester, Jr.

Burial 2

The absolute depth of this burial was 27 inches; height above bedrock was 3 inches. No stones were in association, nor was a burial pit discernible. Only the frontal, parietal, and occipital bones and the enamel of the teeth were present, along with a few limey deposits. However, it appeared that the body was lying on the left side, judging from the position of the fronto-parietal system. One bone awl, apparently a burial offering, was placed on the left side of the head. The awl was in a good state of preservation. The estimated age of the infant burial was 3 months or less. There was no evidence that the teeth had erupted.

Faunal Remains

The following animal remains were identified by William Blackburn Stallcup, Jr., Associate Professor of Biology, Southern Methodist University, and are assumed to be representative of the diet of the peoples who inhabited the shelters—with the exception of *Gioniobasis*, a fossil, probably from the limestone ceiling, and with the possible exception of *Bulimulus*, which could have been deposited naturally.

Mollusca:	*Bulimulus* (c. 10,000)
	Amblema (c. 1,000)
	Gioniobasis (fossil)
Aves:	A large bird: eagle, crane, heron, or goose? (1)
Mammalia:	Deer: *Odocoileus virginianus* (white-tailed) (c. 5)
	Skunk: *Mephitis* (striped?) or *Conepatus* (hog-nosed) (1)
	Opossum: *Didelphis virginiana* (3)
	Swamp rabbit: *Sylvilagus aquaticus* (1)
Reptilia:	Turtle: ? (2)
Osteichthyes:	Catfish: Order *Ostariophysida* (1)*

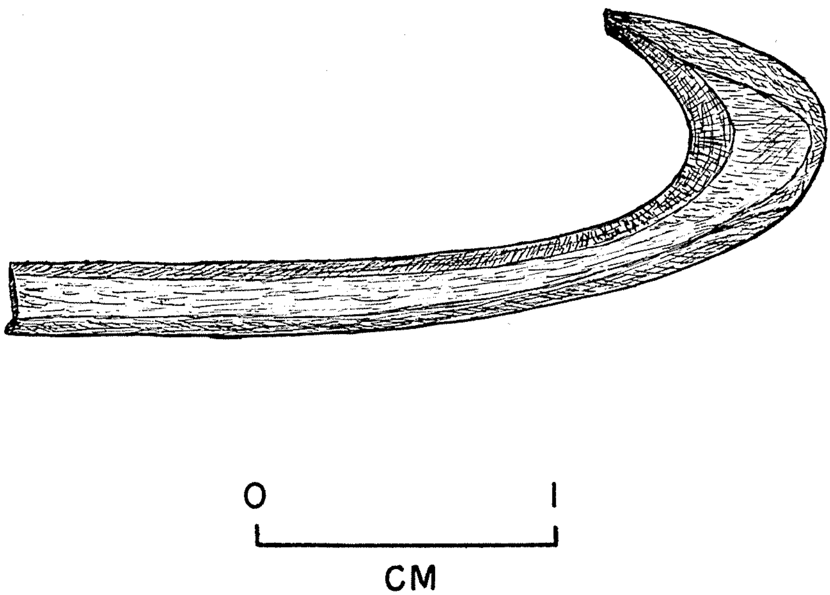

Fig. 11. Carbonized bone fishhook from Little Buzzard Cave. Drawing by Robert Forrester.

Conclusions and Conjectures

Knowledge of the Central Texas Aspect, its age and cultural affiliations, has gone through several stages of analysis in the last fifteen years. Kelley (1947a: 97–109) hypothesized that an Austin Focus of the Central Texas Aspect, characterized by Scallorn points (with

* Identified by Joseph Pollard Harris, Associate Professor of Biology, Southern Methodist University.

Perdiz points often present), represented remains of historic and prehistoric Tonkawa Indians of central Texas, and that a Toyah Focus of the same aspect, characterized by Perdiz points, represented remains of the Jumano Indians who moved periodically from the central to the western part of the state in historic and protohistoric times. Kelley assumed from relations between Central Texas Aspect components and Edwards Plateau Aspect components that the Edwards Plateau Aspect survived as late as the fourteenth and fifteenth centuries (Kelley, 1947b: 127). Miller and Jelks (1952) later found it unfeasible to separate the Central Texas Aspect remains in the Belton Reservoir area into two distinct complexes. Jelks (1953) subsequently discovered a separation of expanding stem arrow points (types Scallorn and Alba) and contracting stem types (Perdiz and Cliffton) at the Blum Rockshelter in Hill County. The expanding stem forms were stratigraphically earlier than the contracting stem forms. Later, Suhm (1957) found a separation of Perdiz-Cliffton (upper levels), Scallorn (middle levels), and Edwards Plateau Aspect remains (lower levels) at the Smith Rockshelter in Travis County.* Suhm reviewed the previous literature in regard to cultural associations and chronology, and reached the following conclusion: whereas the Perdiz and Cliffton arrow point types—because of their relatively late temporal placement—could have had a direct relationship with the Jumano and/or Tonkawa Indians, no positive evidence has yet demonstrated such a connection. Because of a distinct separation of the Scallorn type from the Perdiz and Cliffton types at the Blum and Smith sites, she adopts the Toyah Focus-Austin Focus terminology of Kelley, but rejects Kelley's proposed Jumano-Tonkawa relationship pending further evidence.

Following Suhm's interpretations, it is here concluded that Buzzard Cave is predominantly of the Toyah Focus, that Little Buzzard Cave contained a more or less equal mixture of Toyah and Austin Focus elements, and that Forrester Cave is essentially an Austin Focus component. All three sites seem to be contemporaneous, at least in part, with the Alto Focus of eastern Texas, judging from the presence of Alto Focus pottery and Alba type arrow points.

* [Since Mr. Long's manuscript was received, The Texas Archeological Salvage Project has excavated the Kyle Rockshelter (located less than a mile from the three shelters here reported) where deep deposits containing Central Texas Aspect material revealed the same arrow point sequence found at the Blum and Smith sites—that is, Scallorn points were consistently found in stratigraphically earlier zones than were the Perdiz and Cliffton types. Ed.]

TABLE 1

Distribution of Artifacts by Site

	Buzzard	Little Buzzard	Forrester
CERAMICS			
Leon Plain	2	0	0
Holly Fine Engraved	3	2	0
Goose Creek Plain	1	2	0
Dunkin Incised	2	0	0
Sanders Engraved	0	1	0
ARROW POINTS			
Perdiz	87	44	2
Cliffton	14	8	2
Alba	6	5	8
Fresno	9	5	0
Young	15	12	5
Scallorn	32	38	14
Reed	0	2	0
Cuney	2	0	0
Washita	1	0	0
DART POINTS			
Gary	1	1	0
Darl	0	1	2
Williams	0	1	0
Kent	0	1	0
Pandora	0	3	0
Yarbrough	1	11	0
Palmillas	2	15	0
Wells	0	1	0
Bulverde	0	3	0
Pedernales	1	1	0
Carrollton	1	0	1
Ensor	0	0	1
BLADES			
Type I	0	41	2
Type II	12	12	12
Type III	6	14	1
Type IV	0	3	0
IMPLEMENTS			
Graver	0	1	1
Scrapers & choppers	12	46	1
Crude celts or adzes	0	3	1
Spokeshave	2	0	0
Side-scraper	15	0	0
Snub-nosed scraper	1	0	0
Serrated chips	5	0	0
DRILLS			
Unshaped base	8	6	0
Serrated base	0	3	0
Small squared base	0	1	0
Large squared base	0	1	0
Reworked Palmillas	0	2	0
Reworked Perdiz	0	1	0
Reworked Alba	1	0	0

TABLE 1—Continued

Distribution of Artifacts by Site

	Buzzard	Little Buzzard	Forrester
HAMMERSTONES			
Sandstone	0	3	0
Limestone	0	1	0
Flint	0	1	0
Quartzite	0	7	0
MANOS			
Subrectangular	0	3	0
Irregular flat	0	2	0
Irregular pitted	0	1	0
SHELL			
Perforated mussel shell	0	2	0
BONE			
Ulna awl	2	4	0
Fish hook	0	1	0
Antler flaker	3	5	1
Fish needle	0	1	0
Perforator	3	1	1

If the dart point analysis for Little Buzzard Cave is correct, it must be a multi-component site which gradually accumulated a mixture of material left by different cultural groups. The earlier inhabitants were probably transitional with respect to the Edwards Plateau and Central Texas Aspects.

Using estimated time spans for the different pottery types as given by Suhm, Krieger, and Jelks (1954), an age span of from 500 to 1200 A.D. is indicated for the Central Texas Aspect occupation at the three sites. The estimated dates of Suhm, Krieger, and Jelks (1954) for the various arrow point types suggest a date somewhere between 700 and 1600 A.D.

According to Troike (1955: 113–143) the Central Texas Aspect shares 20 (52.6%) of its total traits with the Henrietta Focus. Henrietta Focus shares 67% of the traits listed by Troike for use as norms and found to be present in Little Buzzard Cave. Edwards Plateau Aspect shares 56%. *But Central Texas Aspect shares only 51%*. While this serves to illustrate the limitations of Troike's methods—because an absolute trait list was used rather than a percentage trait list—it also helps to point up certain other cultural relationships. The writer feels that the consistently high percentage of Central Texas Aspect traits shared with the Edwards Plateau Aspect is further evidence for historical descent of the former from the latter. The high percentage of Edwards Plateau Aspect traits shared with the Henrietta Focus

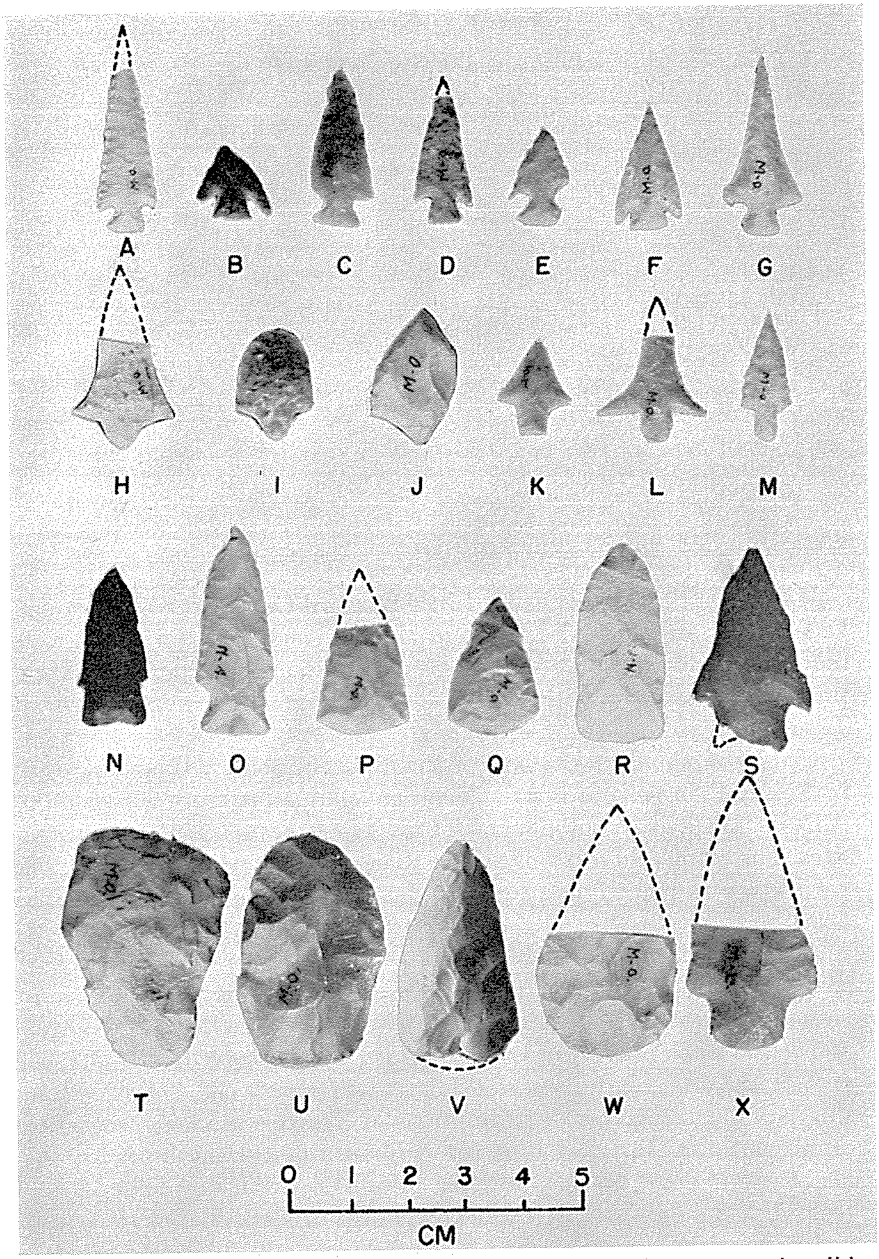

Fig. 12. Chipped stone artifacts from Forrester Cave. A-G, Scallorn arrow points; H-I, Cliffton arrow points; J, Perdiz arrow point; K-M, Alba arrow points; N-O, Darl dart points; P-R, Young arrow points; S, Ellis dart point; T, adz-like implement; U, Type III blade; V-W, Type I blades; X, Carrollton dart point.

suggests that the Edwards Plateau Aspect is also ancestral to the Henrietta Focus. It is possible, too, that the Henrietta Focus was influenced directly during its period of development by the Central Texas Aspect.

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The Devils Mouth Site: A River Terrace Midden, Diablo Reservoir, Texas[1]

LEROY JOHNSON, JR.

Introduction

THE DEVILS MOUTH SITE (University of Texas Site No. 41VV188) is located in southern Val Verde County, Texas, approximately 12 air miles northwest of the city of Del Rio. The site is composed of numerous lenses of occupational debris within a relatively high terrace which overlooks the disemboguement of the Devils River, being situated directly to the northwest of the point where the Devils empties into the sluggish Rio Grande (Fig. 1). The Devils Mouth Site is one of several which have been excavated in the Diablo Reservoir area by the Texas Archeological Salvage Project of The University of Texas, a participant in the Inter-Agency Archeological Salvage Program.

During the winter months of 1958, Messrs. John A. Graham and W. A. Davis (1958: 8, 37) of the Austin office of the U.S. National Park Service found and recorded the Devils Mouth Site while making a boat reconnaissance of a portion of the Rio Grande in connection with their survey of the reservoir. Their report gives the following description of the site:

"The Rio Grande terrace in this area achieves a considerable length and breadth and reaches a depth of some 20 feet. Midden material is scattered over the surface of the terrace across an area of three to four acres. In the eroded face of the terrace a number of small lenses composed of fire-cracked stone and other detritus were observed. The large extent of this site, its considerable depth, and the excellent prospect of clear-cut stratification promise great archeological potential. Its

[1] The archeological investigation of the Devils Mouth site was carried out by the Texas Archeological Salvage Project as a cooperative project of the National Park Service and The University of Texas. The following report was prepared in partial fulfillment of the terms of Contract No. 14-10-333-528 between The University of Texas and the National Park Service.

location near the deepest part of the proposed Diablo Reservoir strongly calls for intensive excavation prior to inundation" (Graham and Davis, 1958: 37).

As a result of this strong recommendation, a small field party was sent out by the Texas Archeological Salvage Project to investigate the site more thoroughly and to carry out preliminary excavations and stratigraphic tests. The field party, under the leadership of Mr. Lathel F. Duffield, was composed of Messrs. Richard E. Ross, LeRoy Johnson, Jr., Carlos Sotomayor, and Alberto Treviño. The results of the work at the site, carried on from December 3 to December 12, 1959, are presented in this paper.

The writer wishes to express his sincere thanks to Mr. Federico Figueroa of Del Rio, on whose ranch the site is located, for permission to dig on his land and for the wholehearted assistance and aid which he gave the field crew during their stay in the area.

Thanks are also due Mr. Edward B. Jelks, executive-director of the Texas Archeological Salvage Project, and Dr. J. F. Epstein of the Department of Anthropology of The University of Texas—both of whom have extensive knowledge of the archeology of western Texas—for the aid which they freely gave the writer in interpreting the data from this site.

Environment

Diablo Reservoir lies within the northeastern fringe area of the Chihuahuan biotic province, which extends from southern New Mexico and western Texas southward into Chihuahua, Coahuila, and parts of Nuevo León, San Luis Potosí, and Zacatecas (Dice, 1943). This province is an arid desert land with many plains, hills, and a few mountains.

In their description of the immediate vicinity of the reservoir, Graham and Davis (1958: 3–4) give the following account:

"Topographically, the Diablo Reservoir area is a semi-arid hilly region of 900 to 1,500 feet elevation, dissected by numerous steep-walled canyons, including the gorges of the Pecos, Devils River, and the Río Grande. Cretaceous limestone of the Comanche Series forms the country rock and is responsible for the rugged, sharply eroded terrain. Thin limestone-derived soils are found on the uplands while alluvial soils occur along the Rio Grande and to a much lesser extent along the Pecos and the Devils.

"Except along the three rivers—the Devils, the Pecos, and the Rio

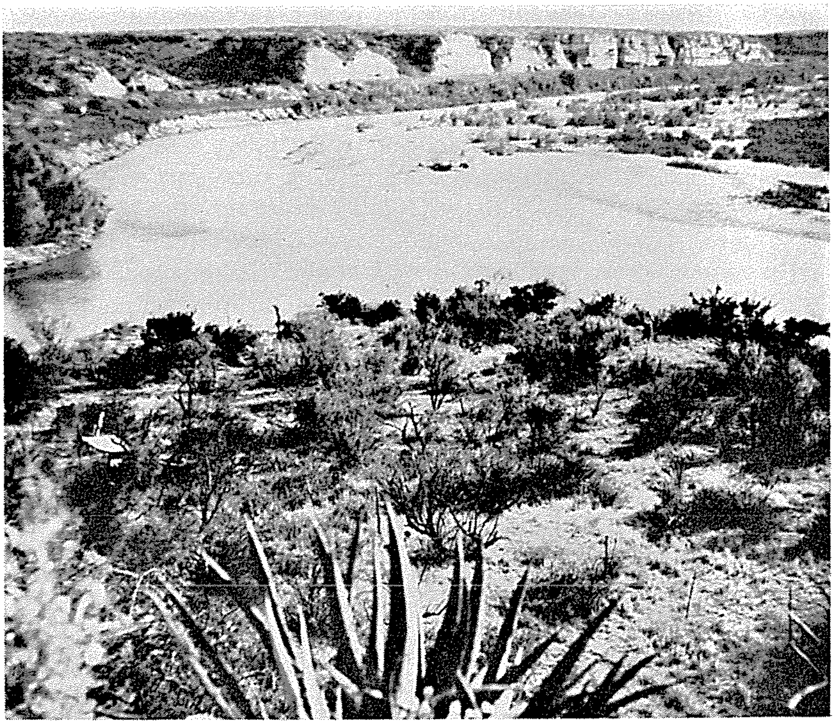

Fig. 1. View of Devils Mouth site looking southeast from cliff above site. Terrace (site) in foreground; Devils River, left background; Rio Grande, right background.

Grande—water is extremely scarce throughout the region. Virtually all the tributary canyons are dry and carry water only during periods of rain.

". . . The climate of the Diablo area is semi-arid. Based on a 47 year record at the nearest weather station, Del Rio, the average rainfall is 15.58 inches. Temperature varies from an average of 60° F. in January to 85° F. in July. The maximum recorded is 110° F. and the minimum 11° F. The wind speed averages 10.7 miles per hour.

". . . Common fauna include peccary, deer, coyote, jackrabbit, beaver, rock squirrel, raccoon, skunk, fox, and ring-tail. The gray wolf, the mountain lion or panther, and the black bear were formerly numerous but are rarely seen now. Reptiles are represented by various lizards and snakes, with the poisonous diamond-back and rock rattlers being notable examples of the class. Centipedes, millipedes, scorpions, and a variety of spiders are the typical myriapods and arachnids. Vultures, ravens, sparrows, wrens, turkeys, ducks, doves, and quail are the most common birds."

The vegetation of the area for the most part consists of thorny shrubs and cacti, although a few trees grow along the rare permanent streams. Ocotillo (*Fouquieria splendens*) is found on the rocky slopes, as well as *Agave lechuguilla*, particularly on limestone soils in the northern part of the reservoir (see Fig. 1). Since the reservoir lies on the fringe of the Chihuahuan biotic province, many plants from adjacent regions to the north and east occur there too, and the total number of plants is larger than it would be for a locality deep within the limits of one province or another. Of these, *Fouquieria splendens*, the desert members of the Liliaceae, Compositae, and several of the grasses are relatively abundant around the mouth of the Devils River.

Description of the Site

The terrace in which the midden deposits occur rests against the south slope of a high limestone cliff which rises some 130 ft. above the present level of the Rio Grande and Devils River at their conflux (Figs. 1 and 2). The slopes of the cliff are rough, but not at all difficult to scale as are the sheer canyon walls of the Rio Grande farther upstream; there the river is much more entrenched and the channel narrower and considerably deeper. The surface of the terrace, now approximately 30 ft. above the water level, is comparatively flat and is covered by a rather lush assemblage of low bushes and grasses which seem to have checked the erosion which would otherwise result from rainfall. The edges of the terrace, however, show evidence of severe cutting by the rivers during periods of inundation. At the present time both the Rio Grande and the Devils are quite shallow, and at several points near the site one can wade across either without particular difficulty.

The terrace extends, on an average, about 150 ft. southward from the cliff face toward the Rio Grande, although at one point it attains a width of some 200 ft. Cultural detritus was observed on the surface of the terrace for a distance of approximately 1000 feet along the Rio Grande, although the excavations were confined to the extreme eastern part of the site. The faces of the terrace tend to be perpendicular near the top, which fact facilitated the observation and recording of the natural zones occurring therein. East of the terrace, just above the level of the water, is a long, flat exposure of bedrock limestone with several deep, oval mortars worn into the rock (Fig. 2).

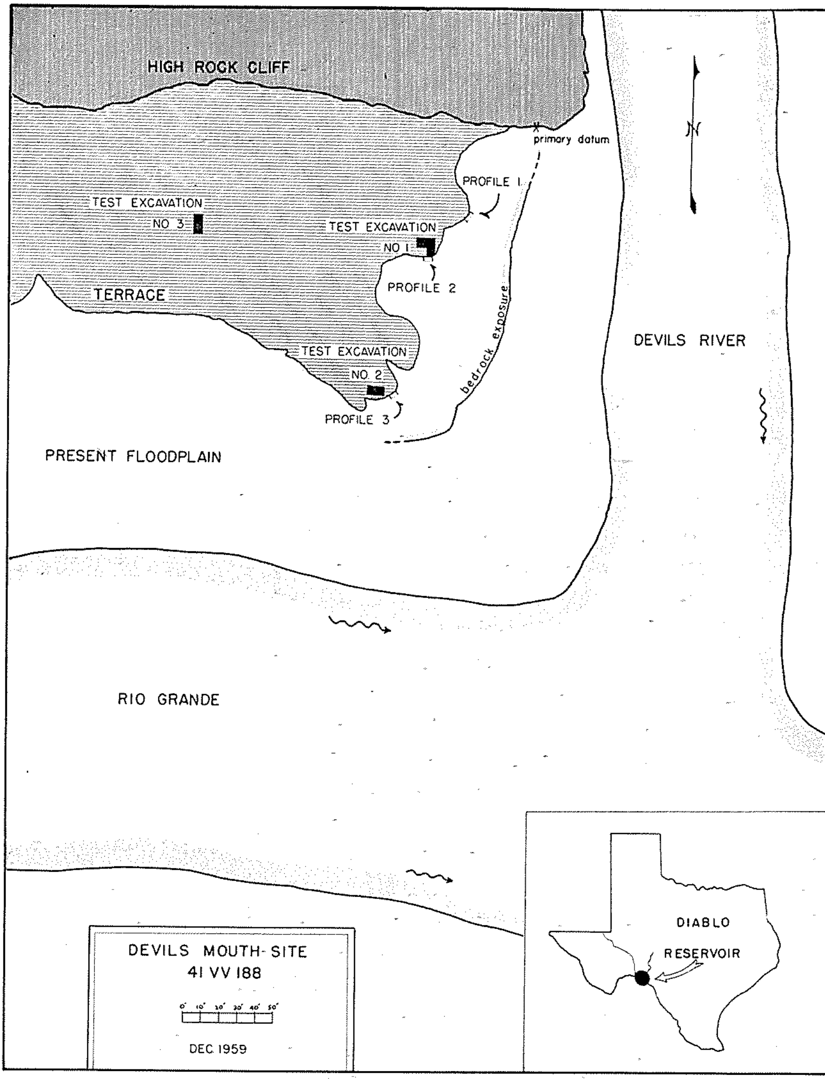

Fig. 2. Sketch map of Devils Mouth site.

On the surface of the terrace mesquite is quite common, and several species of grass grow abundantly. Contrariwise, *Acacia* seems to replace mesquite almost entirely on the rocky cliffs above the site, and the grass is not nearly so profuse. Also, presumably because of the rich soil, the plants growing on the terrace surface attain a higher and fuller growth than those on the nearby hills.

Unfortunately, the Pleistocene and Recent terraces of the Rio Grande have not undergone correlative studies in the area of the Devils Mouth Site, and no statements can be made at this time concerning their geologic affinities. Future work in the area should have as a goal correlation with terrace sequences of other regions—for instance, with those of the Big Bend area. Such studies, however, were outside the scope of work of our field party.

Work Done at the Site

To begin with, a rather hasty sketch map of the site was prepared by plotting in the edge of the terrace, using a transit and an alidade, and by correlation with U. S. Geological Survey topographic sheets. A future field party should construct a complete, detailed contour map of the site and surrounding terrain.

In order to facilitate recording procedures, an orange-colored metal stake was driven horizontally into the rock face of the cliff adjacent to the terrace, was designated "primary datum," and was assigned an arbitrary elevation of 100 ft. (Fig. 2). All measurements at the site, both vertical and horizontal, were calculated in relation to this point. Next, two lines of metal stakes were laid out across the site, one going from north to south, the other from east to west. The former was given the designation "W500," the latter, "N500."

It was then decided to clean the exposed face of the terrace at several points in order to record the gross natural stratigraphy of the site. Three profiles were taken: No. 1, approximately 60 ft. away from the rock cliff and facing towards Devils River; No. 2, about 90 ft. from the cliff and likewise facing Devils River; and No. 3, which was 170 ft. out from the cliff and facing the confluence of the two rivers. After the profiles had been cleaned, a series of occupation zones, extending from the top to the bottom of the terrace and separated by apparently sterile strata, was clearly discernible.

Next, three test pits were sunk into the terrace surface in the hope of acquiring artifacts which might reveal cultural stratigraphy. Each pit consisted of two contiguous 5-ft. squares; each square was given the north-south designation of the stake in its southeast corner. Although digging was done by half-foot, artificial levels, care was taken to record natural stratigraphy in the excavating process as well.

Test Excavation No. 1, consisting of 5-ft. squares N480-W350 and N480-W355, was opened just inside the terrace edge at the point where Profile 2 had been recorded, and the stratigraphy encountered therein was for all practical purposes identical to that of the profile. A maximum depth of 6.5 ft. was reached.

Test 2, which included squares N390-W390 and N390-W395, was put down near Profile 3 in the area where the upper midden deposits seemed to be thickest. This excavation attained a depth of 7 ft. and yielded more artifacts than either of the other two tests.

Test 3 was placed far back from the terrace edge, and it reached a depth of 3.5 ft. This third test embraced 5-ft. squares N495-W495 and N490-W495.

All of the soil removed from the three pits was passed through hardware cloth having a ¼-inch mesh, and all bone fragments, shells, spalls of chert, etc., were placed in paper bags labeled with appropriate depth and square designations, and were taken back to the laboratory for study and description.

In order to determine the desirability of having a palynological study done at the site at some later date, three soil samples were collected from Test 1 and sealed in glass tubes. Also, soil samples were collected for all the strata represented in Profile 3 for purposes of lithological and other analyses. Unfortunately, because of time limitations, these particular studies have not yet been completed.

Internal Structure of the Site

The natural zoning of the site was determined from the three profiles cleaned along the terrace face and from the three test excavations. Because of their greater depth, the profiles proved most useful in providing an overall picture of the bedding and zoning. A general, but tentative, correlation has been made between these profiles and is presented graphically in Fig. 3. Because the deeply buried beds at the bottom of the columns could not be studied and defined as thoroughly as those occurring higher up, the designation of the strata could not proceed from bottom to top, as is customary in describing geologic columns, but rather it was necessary to progress from the surface downward. This seems to be the most practical procedure, since future work may reveal as yet unrecognized zones at the base of the sequence. The designations for these new zones can be easily added in their proper sequence to the end of the series presented here (see Fig. 3).

Zone A, the surface zone, consists of humus-stained, brown, unconsolidated sand and a small amount of occupational debris; it ranges from 0.4 to 1.5 ft. in thickness.

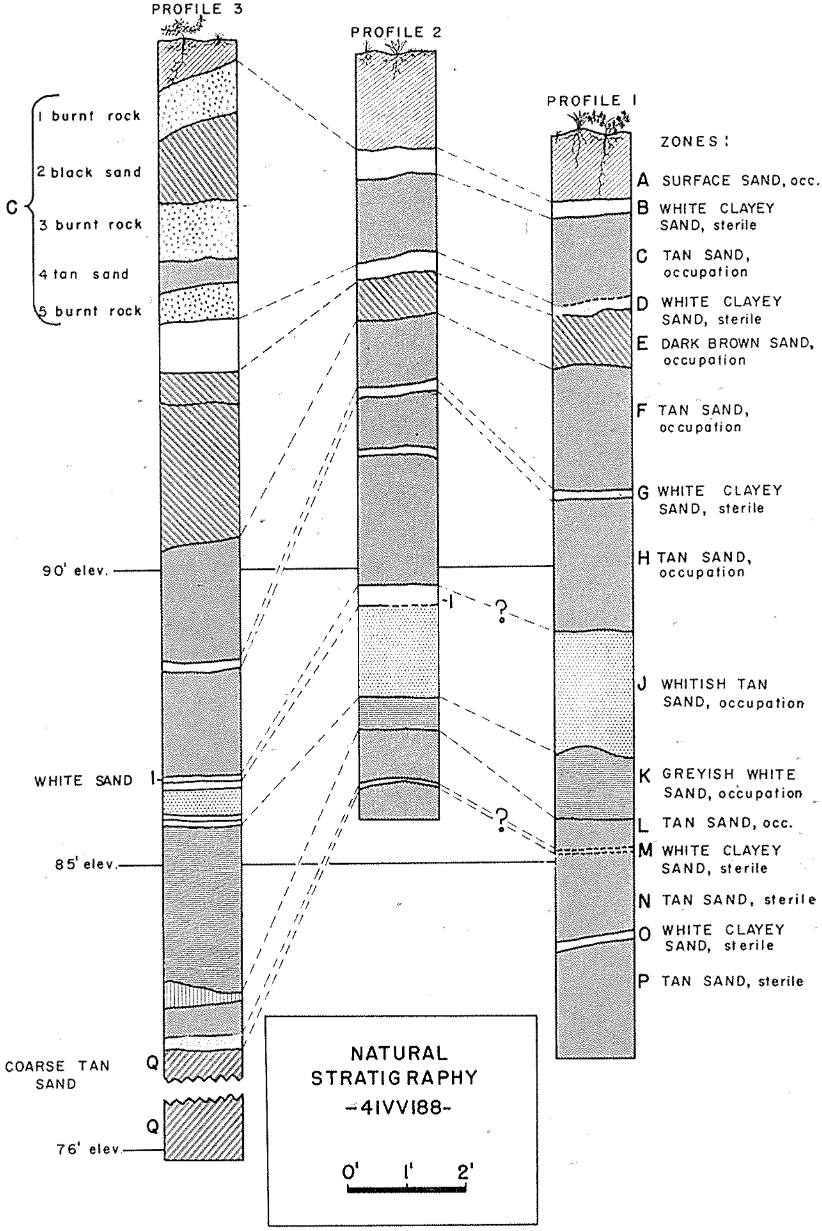

Fig. 3. Natural stratigraphy of Devils Mouth site.

Zone B, a relatively thin zone of somewhat clayey, whitish-brown sand, is sterile of artifacts; this bed ranges from 0.2 to 0.5 ft. in thickness.

Zone C is a thick occupation deposit of tan-colored sand containing a large amount of burnt rock and midden material; though more or less consistent in Profiles 1 and 2, where it ranges from 1.3 to 1.5 ft. in thickness, Zone C divides into five distinct lenses in Profile 3, attaining there a thickness of 4.3 ft. These lenses are labeled Zones C1 through C5 in sequence from top to bottom.

Zone C1 consists of dark black midden soil with a large amount of burnt limestone fragments of small size.

Zone C2 is a lens of dark brownish-black, sandy soil with abundant charcoal flecks.

Zone C3 is a relatively thick layer of dark-brown sand and burnt rock.

Zone C4 contains a tan, sandy soil with charcoal flecks.

Zone C5 is a layer of burnt rock and charcoal flecks. All of these subdivisions of Zone C show evidence of heavy occupation, and from them came a majority of the artifacts from Test 2.

Zone D, ranging from 0.2 to 0.9 ft. in thickness, is a bed of compact clayey sand of a whitish-brown color very similar in texture and composition to Zone B. It likewise seems to be sterile of artifacts and cultural debris.

Zone E is an occupation zone of dark brown sand and abundant burnt rocks, ranging in thickness from 0.7 to 2.8 ft.

Zone F is a thick layer of light tan sand with a small amount of burnt rock. This bed ranges from 1.1 to 2.1 ft. in thickness.

Zone G is composed of apparently sterile, whitish, clayey sand similar to that of Zone B and D except that G seems to have more clay present. It ranges from 0.1 to 0.2 ft. in thickness.

Zone H, a thick layer of light tan, compact sand, contains very little in the way of occupational materials. It ranges from 2.2 to 3.3 ft. in thickness. In Profile 2, Zone H is cut by a thin lens of whitish clayey sand, which, however, could be detected neither in Profile 1 nor in Profile 3. For that reason it has not been assigned a letter designation.

Zone I consists of sterile, white sand; this zone did not appear at all in Profile 1, and only very faintly in Profile 2. It ranges in thickness from 0.1 to 0.3 ft. Below it, but only in Profile 3, is found a thin, local lens of dark gray sand with charcoal particles.

Zone J is a layer of brownish-white sand which evidences some light occupation. This zone is quite thin in Profile 3, but is well represented in both 1 and 2. It ranges in thickness from 0.4 to 2.0 ft. Below this zone, in Profile 3, occur two local, thin lenses of reddish sand with abundant charcoal flecks.

Zone K, consisting of a grayish-white sand showing some occupation debris, is well represented in all three profiles, ranging from 0.6 to 2.8 ft. in thickness.

Zone L, a stratum of light tan sand, contains a few fire-cracked stones. Although the indications are few, it seems that this layer constitutes the deepest occupation zone which can be seen in the terrace faces. The thickness of Zone L ranges from 0.5 to 0.8 ft.

Zone M is a very thin zone of white clayey sand, lacking any indication of occupation. It ranges in thickness from 0.1 to 0.3 ft. Just below Zone M the recording of Profile 2 was terminated.

Zone N, in Profile 1, follows Zone M, and consists of light tan sand 1.5 ft. thick, which is seemingly sterile.

Zone O is a thin bed of white, clayey, sterile sand 0.2 ft. thick which was observed only in Profile 1.

Zone P is a relatively thick deposit of hard, compact, tan sterile sand appearing in Profile 1. The recording of Profile 1 was terminated at a distance of 15 ft. below the surface of the terrace, the base of Zone P not being reached.

In Profile 3 the N—O—P sequence could not be recognized. Rather, Zone M, the layer of sterile clay and sand, is there underlain by a group of ill-defined zones of light tan and buff-colored sand, 5.4 ft. thick, which seems to extend downward to the low exposure of bedrock 23 ft. below the top of the terrace. These beds are represented, collectively, by the letter Q in Fig. 3. Because of the sharp inclination of the terrace faces near the bottom, the profile cuts had to be offset several times in the direction of the rivers as work progressed downward, in order to avoid moving a tremendous quantity of soil. Consequently the lower portions of the profiles were not cut in vertical planes, a factor that may have some bearing on the difficulty of correlating the lower zones in Profiles 1 and 2.

In general, the picture we have gained of the natural stratigraphy from these three profiles is the following. Several (at least eight) superimposed natural geologic zones are present which show signs of human occupation, separated, for the most part, by apparently sterile zones of sand and clayey sand evidently deposited on the site in times of inundation. These sterile zones served, it seems, to seal off from each other the several different occupational beds, thereby making the possibility of acquiring clear-cut cultural stratigraphy excellent. Unfortunately our field crew could only test the upper few strata, and it remains for a future expedition, with ample time and funds, to excavate a complete column of the 30 ft. of sediments present in the terrace.

Occupational Features

Only one occupation feature was found at the site: the partial outline of a large pit (Fig. 4) discovered in the eroded face of the terrace only a few feet from the spot where Profile 2 was recorded. The surviving portion of the pit measured approximately 3.5 ft. in diameter and 2.5 ft. in depth, and contained dark black soil in which were many small fire-cracked limestone rocks. Unfortunately the major part of the pit's fill had been eroded away, and though the soil was passed through screens, no artifacts were recovered.

It seems that the original surface from which the pit was dug is the line dividing Zone E from Zone F. Much of the soil in Zone E, Profile 2, is like that found in the pit.

The use to which the pit could have been put remains a problem. The soil immediately under it shows no signs of alteration due to heating.

Description of the Artifacts

Considering the amount of soil moved in the three test excavations (850 cubic ft.), a relatively small number of artifacts, 113, was recovered. These include dart points, arrowheads, scrapers, knives, potsherds, and other miscellaneous artifacts. In spite of the somewhat disappointing returns, some interesting evidence on cultural stratigraphy was acquired from these implements (see section entitled "Provenience of the Artifacts").

Techniques of Flintknapping

Before beginning the description of the lithic artifacts, it seems appropriate to present a short discussion of the knapping techniques involved in their manufacture. Dr. J. F. Epstein (1960) has prepared a comprehensive analysis of the lithic technology of nearby Centipede (VV191) and Damp rockshelters (VV189) including precise classification of the different kinds of flakes, cores, etc., which are distinguishable from each other by their diverse methods of manufacture. Dr. Epstein kindly let me read his manuscript report of excavations at Centipede and Damp shelters, and has permitted me to borrow from his classification of knapping techniques.

Several classes of chipped artifacts were made from cores: choppers, perhaps a few of the knives, and rarely a scraper. The rest of the artifacts were made from flakes, the classification of which, following somewhat the terminology developed by Epstein, is given below.

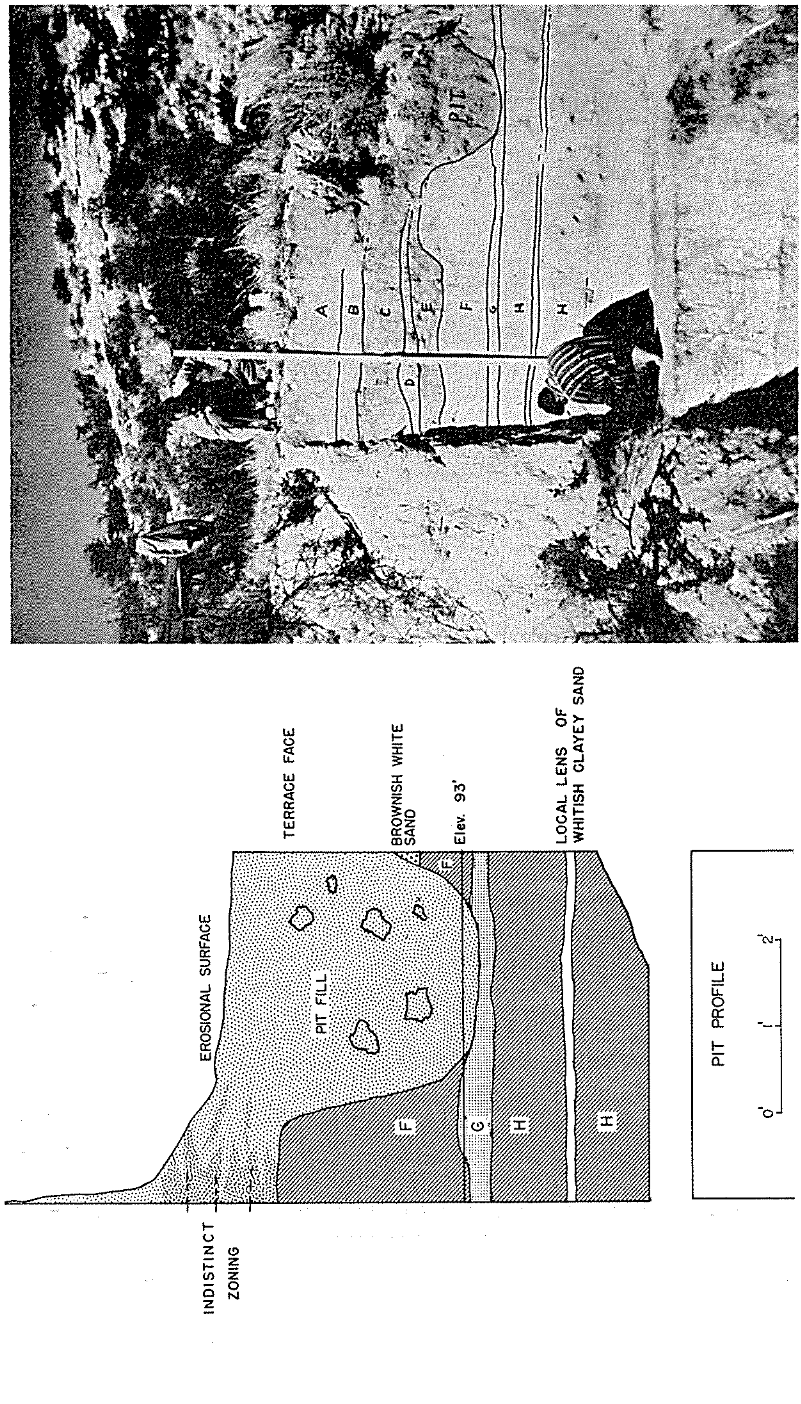

Fig. 4. Pit at Devils Mouth site. A, cross section near Profile 2. B, photograph showing cross section of pit (looking north toward cliff from the terrace edge).

(1) *Initial cortex flakes*—the first flakes knocked from a rounded chert nodule, resulting in a plano-convex shape for the flakes, with the convex surface retaining the patina (or cortex) of the nodule.
(2) *Cortex flakes*—large flakes knocked from the nodule after the removal of initial flakes but without the advantage of any prepared striking platform. The exterior surface of the nodule, the cortex, still shows clearly on one or more edges of these flakes; hence their name.
(3) *Flakes struck from a core having a prepared platform*—long, narrow flakes that exhibit a positive bulb of percussion and a flattened area above the bulb representing a small part of the original platform; they occur very rarely at the Devils Mouth Site.
(4) *Billet flakes*—wide, thin flakes, somewhat longer than most pressure flakes, exhibiting a small positive bulb of percussion as evidence of conchoidal fracture. They have a rather small flat area above the bulb, or frequently lack this flattened area altogether. Laboratory experiment has shown that these flakes can best be produced using a bone or antler billet, although hammerstones sometimes produce the same kind of flakes.

A technique used frequently for retouching artifacts is the pressure method of removing very small flakes, often employed in the making of dart points and arrow points. Most pressure flakes, unfortunately, are too small to be caught by the ¼-inch mesh screens used in excavation, but use of the pressure technique is evident on several of the artifacts themselves, particularly the dart and arrow points.

Dart Point Types

In all, 40 identifiable dart points and dart point fragments were recovered. Many of these fit existing type categories fairly well, while others show only general resemblances to recognized types. For those points of recognized types, the current taxonomic names will be employed. Groups of points, however, which do not conform to established taxonomic designations will be considered as provisional types and will be assigned letters of the alphabet for identification purposes. Although an extensive analysis was not made, it seems that locally acquired gray cherts were used almost exclusively in the manufacture of the dart points.

Montell (Fig. 5: e, f, g)

No. of specimens: 12
Overall proportions: large and relatively broad
Blade:
shape—triangular to leaf-shaped with considerable variation

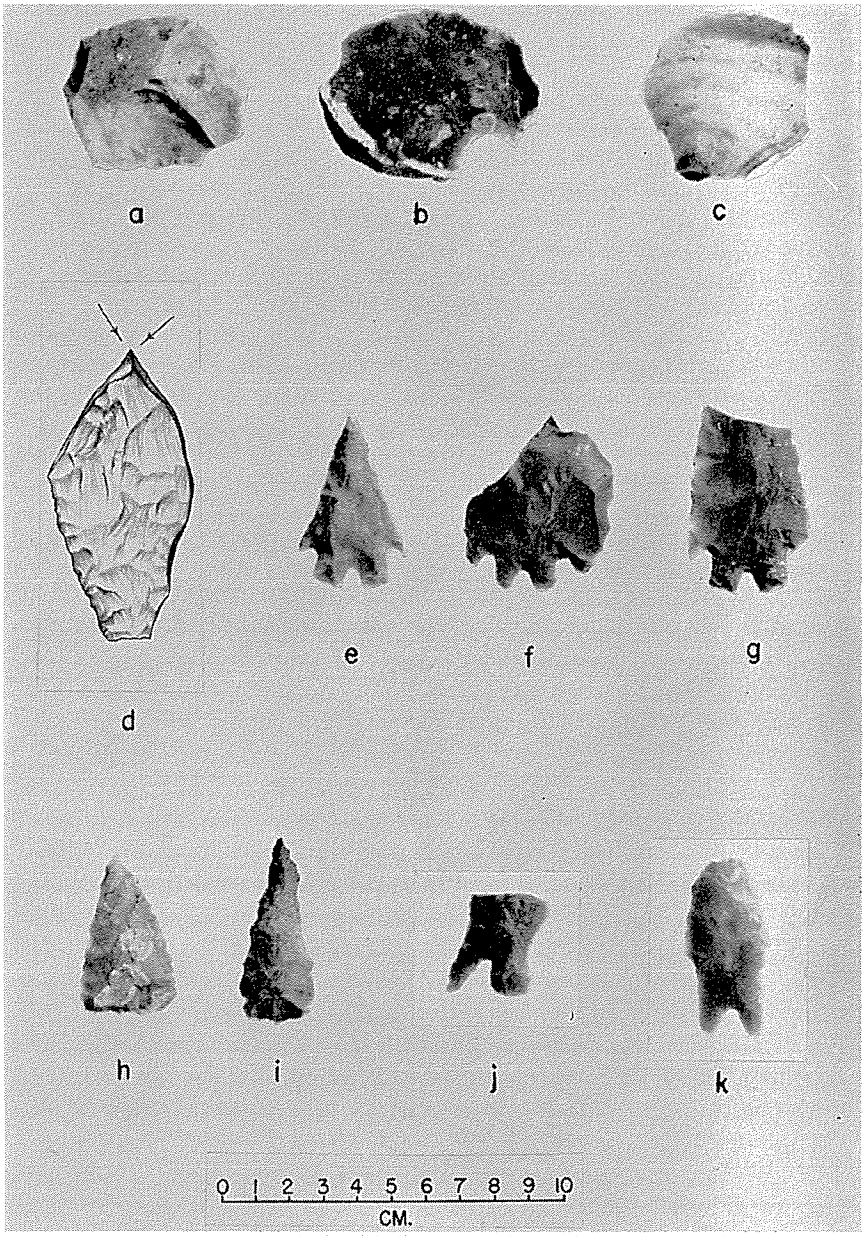

Fig. 5. Artifacts from Devils Mouth site. a-b, cortex flake scrapers; c, prepared platform scraper; d, burin; e-g, Montell dart points; h-i, Abasolo dart points; j, Shumla dart point fragment; k, Pedernales dart point.

edges—generally straight, sometimes markedly convex
shoulders—pronounced; extremely well developed barbs on all but 4 specimens

Stem: one-fifth to one-fourth the length of the entire point
shape—slightly expanded and bifurcate
edges—straight but diverging toward the base
base—divided by a deep V-shaped notch; the base of each half of the stem is flat to slightly convex

Length: range, 40 to 70 mm.; average, 55 mm.

Width across the shoulders: range, 27 to 42 mm.; average, 35 mm.

Thickness: range, 4 to 7 mm.; average, 5 mm.

Workmanship: These large points are very thin in cross section, and were made by the removal of thin, wide flakes from the surface. According to Dr. J. F. Epstein (personal communication), these *Montell* points could well have been thinned by the billet technique.

Remarks: Although considerable variation is present in the sample of *Montell* points from the Devils Mouth Site, the range of variation exhibited falls within the definition of the type given by Suhm *et al.* (1954: 452, Plate 105). Because of the limited sample at hand, no varieties can be set up at the present time.

Abasolo (Fig. 5: h, i)

No. of specimens: 2

Overall proportions: medium-sized; triangular-shaped

Blade:
shape—roughly triangular
edges—straight to slightly convex; left edge of both faces markedly beveled

Stem: none

Base: slightly convex

Length: first specimen, 45 mm.; second specimen, 51 mm.

Width at base: first specimen, 28 mm.; second specimen, 21 mm.

Thickness: first specimen, 8 mm.; second specimen, 8 mm.

Workmanship: These points are thicker in cross section than the *Montell* points and do not seem to exhibit the billet flaking of the latter type. On the contrary, narrow and deep flakes were removed from the surface of the points, perhaps by percussion with a hammerstone.

Remarks: These points fit the definition for the *Abasolo* type as defined by Suhm *et al.* (1954: 400, Plate 79).

Shumla (Fig. 5: j)

No. of specimens: 1 fragment lacking the distal part and one shoulder
General proportions: undeterminable
Blade:
  shape—undeterminable
  edges—undeterminable
  shoulders—pronounced with long barbs reaching to the base of the stem
Stem:
  shape—subtriangular
  edges—very slightly convex
  base—slightly rounded
Length: undeterminable
Width: undeterminable
Thickness: 5 mm.
Workmanship: The billet technique of removing long, wide flakes is not evidenced. Rather, the flake scars are deep and narrow.
Remarks: Although the point identified here is fragmentary, the stem and barb are peculiar to the *Shumla* type (Suhm *et al.*, 1954: 480, Plate 119).

Pedernales (Fig. 5: k)

No. of specimens: 1 (lacking tip of the blade)
Overall proportions: long and narrow
Blade:
  shape—triangular
  edges—straight
  shoulders—slight, lacking barbs
Stem: approximately one-third the length of the entire point
  shape—straight and bifurcate
  edges—straight
  base—divided by a deep V-notch; the base of each half of the stem is pointed
Length: 65 mm. (estimated)
Width across shoulders: 26 mm.
Thickness: 6 mm.
Workmanship: Relatively wide, thin flakes, possibly representing the billet technique, were removed from the surface; little secondary flaking is evidenced.
Remarks: This point conforms to the definition of the type given by Suhm *et al.* (1954: 468, Plates 113, 114, 115).

Frio (Fig. 6: a)

No. of specimens: 1
Overall proportions: short and broad
Blade: (fragmentary, lacking the tip)
  shape—triangular
  edges—straight
  shoulders—prominent but without barbs
Stem: approximately one-third the length of the entire point
  shape—sharply expanding and bifurcate
  edges—concave
  base—concave and recurved
Length: 37 mm. (estimated)
Width across the shoulders: 24 mm.
Width across the base: 23 mm.
Thickness: 6 mm.
Workmanship: some secondary pressure flaking; no evidence of billet flaking
Remarks: This point resembles closely several examples of the *Frio* type defined by Suhm *et al.* (1954: 428; Plate 93, S, V, and Y), but also shows resemblance in stem outline to the *Martindale* type (*ibid.*: 446, Plate 102).

Langtry (Fig. 6: b)

The basal and medial portion of a *Langtry* point could be identified. This fragment shows the weak shoulders, contracting stem and flattish base so characteristic of that type.

PROVISIONAL DART POINT TYPES

Provisional Type A (Fig. 6: c, d)

No. of specimens: 3 (fragmentary; tips lacking)
Overall proportions: medium-sized, somewhat narrow
Blade:
  shape—triangular or laurel leaf-shaped
  edges—straight to slightly convex
  shoulders—well developed, with moderately long barbs on 2 specimens
Stem: one-fifth to one-fourth the length of the entire point
  shape—expanding slightly toward the base
  edges—straight to very slightly concave
  base—slightly concave

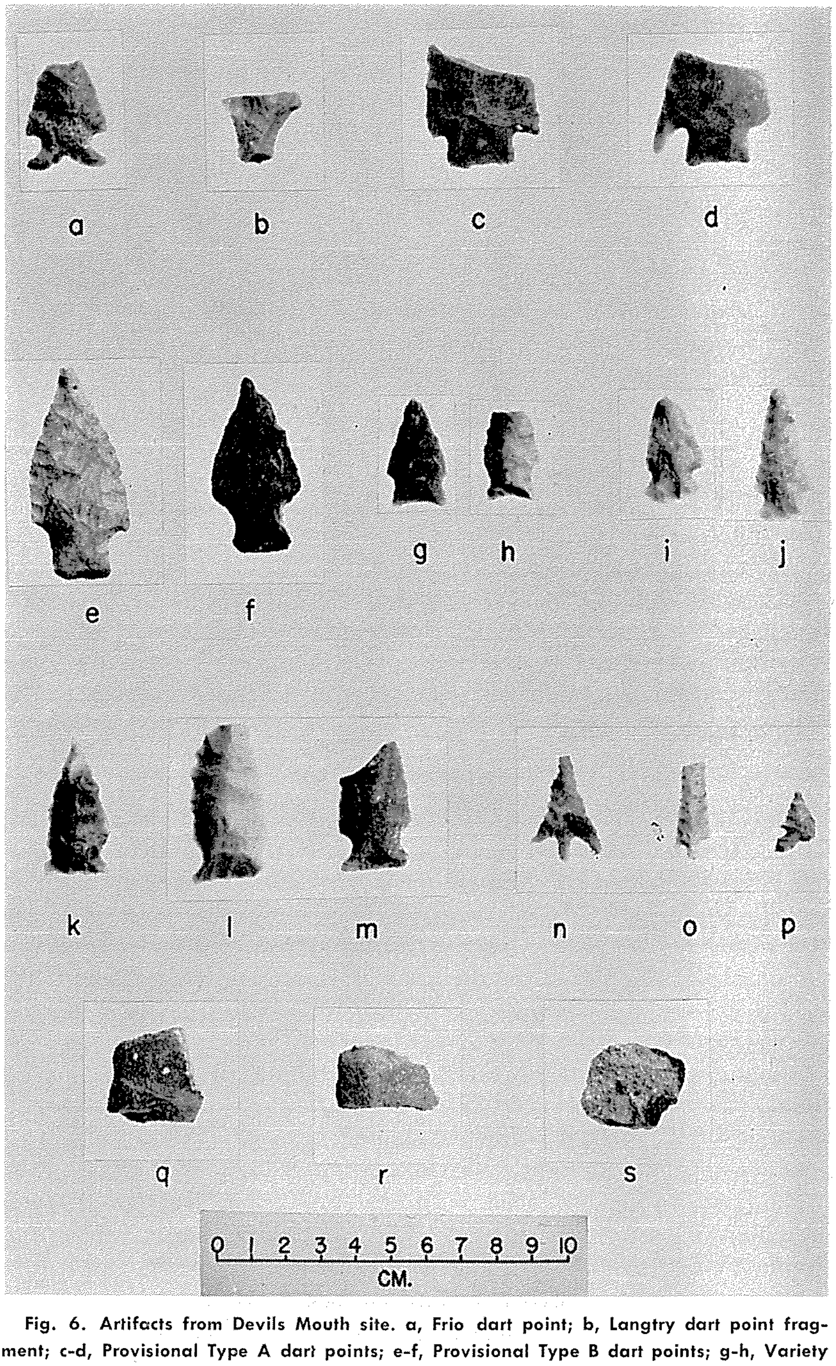

Fig. 6. Artifacts from Devils Mouth site. a, Frio dart point; b, Langtry dart point fragment; c-d, Provisional Type A dart points; e-f, Provisional Type B dart points; g-h, Variety C1 dart points (Provisional Type C); i-j, Variety C2 dart points (Provisional Type C); k, Variety C3 dart point (Provisional Type C); l-m, Provisional Type D dart points; n, Perdiz arrow point; o, arrow point; p, Toyah arrow point; q-s, potsherds.

Length: 60 mm. (estimated average)

Width across shoulders: first specimen, 35 mm.; second specimen, 35 mm.; third specimen, 33 mm.

Thickness: first specimen, 7 mm.; second specimen, 5 mm.; third specimen, 5 mm.

Workmanship: All three examples are thin and show the removal of large, wide flakes as well as some amount of secondary flaking.

Remarks: These points belong to the tradition of stemmed points represented by the *Marshall* and *Lange* types. The points of *Type A*, however, fall within the extreme limits of both those types as defined by Suhm *et al.* (1954: 436, 444), but fit the norm for neither. Their stems are too wide for *Marshall*, yet do not expand enough for the *Lange* category.

Provisional Type B (Fig. 6: e, f)

No. of specimens: 2

Overall proportions: long and narrow

Blade:

shape—somewhat lanceolate

edges—slightly convex

shoulders—fairly well developed, but without barbs

Stem: about one-third the length of the entire point

shape—very slightly expanding

edges—concave; beveled on one face only

base—slightly rounded

Length: first specimen, 60 mm.; second specimen, 50 mm.

Width across the shoulders; first specimen, 29 mm.; second specimen, 26 mm.

Thickness: first specimen, 6 mm.; second specimen, 7 mm.

Workmanship: These examples exhibit short, deep flake scars and very little secondary flaking. Evidence is lacking for billet flaking.

Remarks: These two points are very much like the *Nolan* type in general outline and in stem shape. However, both specimens have stems with the edges beveled only on one face, while true *Nolan* points usually have stems beveled on both edges but on opposite faces. These points can, perhaps, be considered as variants of the *Nolan* type.

Provisional Type C

Type C is made up of 10 rather small dart points with expanding stems and short blades. They will here be broken down, for descriptive purposes, into three varieties. These points may form part of a large group of small stemmed dart points (including *Darl* and *Fairland* types) that seem to be relatively late in the Archaic Stage over much of Texas.

Variety C1 (Fig. 6: g, h)

No. of specimens: 4
Overall proportions: small and relatively wide
Blade:
  shape—triangular
  edges—straight
  shoulders—weak, without barbs
Stem: about one-third the length of the entire point
  shape—expanding and short
  edges—concave
  base—concave
Length: range, 30 to 40 mm.; average, 36 mm.
Width across the shoulders: range, 17 to 22 mm.; average, 19 mm.
Thickness: range, 4 to 7 mm.; average, 6 mm.
Workmanship: These points are proportionately thicker in cross section than the *Montell* points and show shorter and deeper flake scars. The workmanship gives the impression of being quite poor.
Remarks: *Variety C1* is distinguished here from the other varieties of *C* by its concave base. *C2* has a markedly convex base, while the base of *C3* is flattened. All three, however, are small, have expanding stems, and seem to be closely related to each other. The shoulders of *C1* are less strongly developed than those of *C2*, however, with the latter variety exhibiting small barbs. *C1* is quite similar to the *Uvalde* point (Suhm *et al.*, 1954: 486) and to the *Martindale* (*ibid.*: 446) and *Darl* points (*ibid.*: 414). It seems probable that all represent a common stemming tradition.

Variety C2 (Fig. 6: i, j)

No. of specimens: 3
Overall proportions: small and broad
Blade:
  shape—triangular to subtriangular
  edges—straight or slightly convex
  shoulders—well developed with short barbs
Stem: approximately one-fourth the length of the entire point
  shape—short and expanding

edges—concave
base—convex

Length: first specimen, 32 mm.; second specimen, 35 mm. (estimated); third specimen, 40 mm.

Width across the shoulders: first specimen, 17 mm.; second specimen, 21 mm.; third specimen, 17 mm.

Thickness: first specimen, 6 mm.; second specimen, 5 mm.; third specimen, 5 mm.

Workmanship: The flake scars are short and deep, with little secondary flaking.

Remarks: This variety is distinguished from the other varieties of *Type C* by its convex base and short barbs.

Variety C3 (Fig. 6: k)

No. of specimens: 3
Overall proportions: small and thick
Blade:
shape—subtriangular
edges—slightly convex
shoulders—slight, without barbs
Stem: one-fourth to one-third the length of the entire point
shape—sharply expanding
edges—concave
base—straight

Length: first specimen, 22 mm., second specimen, 37 mm.; third specimen, 40 mm.

Width across the shoulders: first specimen, 16 mm.; second specimen, 17 mm.; third specimen, 18 mm.

Thickness: first specimen, 4 mm.; second specimen, 5 mm.; third specimen, 5 mm.

Workmanship: The flake scars are short and rather deep, and the points exhibit little secondary flaking. These were not made by the billet technique.

Remarks: *Variety C3* is distinguished from *C1* and *C2* by its straight base. Also, this variety shows some resemblance to the *Ensor* dart point type, but is somewhat under the size range for *Ensor* (Suhm *et al.*, 1954: 422, Plate 90).

Provisional Type D (Fig. 6: l, m)

No. of specimens: 3
Overall proportions: large and long

Blade:
- shape—sharply expanding
- edges—concave
- base—concave to almost straight

Length: first specimen, 50 mm. (estimated); second specimen, 50 mm.; third specimen, 53 mm.

Width across shoulders: first specimen, 21 mm.; second specimen, 21 mm.; third specimen, 22 mm.

Thickness: first specimen, 8 mm.; second specimen, 6 mm.; third specimen, 9 mm.

Workmanship: Chipping was done by the removal of short, deep flakes, presumably by percussion.

Remarks: *Type D* is quite close to the *Ensor* type described by Suhm *et al.* (1954: 422, Plate 90). However, the present points have wider side notches and a more concave base than points illustrated by Suhm *et al.*

Miscellaneous Dart Points

Among the points which could not be typologically identified or described are one large, leaf-shaped point with very shallow side notches, and three basal fragments of medium-sized, expanding stem dart points. These latter points are too fragmentary to allow for a fuller description.

Arrow Points

Only one intact arrow point and two arrow point fragments were found at the Devils Mouth Site. The first (Fig. 6: n) is a small, thin point whose dimensions are 32 mm. (length) by 21 mm. (width) by 3 mm. (thickness). It is of the *Perdiz* type (Suhm *et al.*, 1954: 504), having a long, contracting stem and relatively long barbs.

One of the fragmentary points (Fig 6: p) belonging to the *Toyah* type (Suhm *et al.*, 1954: 508), has a triangular outline, and side and base notches. The other fragment (Fig. 6: o) is an extremely narrow specimen with small contracting stem and barbs. It resembles, in a very general way, the *Perdiz* arrow point, but is much narrower and proportionately longer, having an estimated length of 35 mm. and a width of only 11 mm. All three points were made by pressure flaking.

Burin

Dr. J. F. Epstein (1960), in his excavation of the nearby Centipede Rockshelter, found an abundance of burins throughout the whole sequence of artifacts from that site. Only one artifact (Fig. 5: d) from the Devils Mouth Site, however, fits the burin category. This is an apparently reworked knife or blade from which two long flakes were struck to produce a burin cutting bit. The bit has an angle of approximately 70 degrees. This implement is 61 mm. long, 30 mm. wide, and 5 mm. thick (for provenience see Table 1).

Fist Axes

Two small fist axes (Fig. 7: a, b) were recovered from the site, one 70 mm. in length, the other 88 mm. Each has a well worked, pointed distal end, while the other extremity is relatively broad and thick; these are the definitive characteristics of fist axes. Both faces have been worked, presumably by percussion flaking, and the edges of the larger specimen show some signs of secondary pressure flaking as well. Much of the cortex of the original core can be seen on the basal part of the larger specimen.

Chopper

One large implement (Fig. 7: d) is a slightly reworked flint core, having been flaked by percussion on one edge and adjacent parts of both faces into a chopper. The maximum diameter of this artifact is 93 mm. Choppers, in contrast to the pointed fist axes, have wide cutting edges which may be straight or somewhat convex.

Knives

A group of 17 fragmentary bifacial tools are here classified as knives. They can be divided into two groups: knives of a general rounded or oval outline (3 specimens), and those which seem to have been originally leaf-shaped (14 specimens, Fig. 7: c), having more or less pointed ends. There is a considerable size range in both groups with specimens varying from 50 to 80 mm. in length. The workmanship is generally quite crude, and it appears that all the work was done by the percussion technique. As far as can be determined, all specimens were manufactured from large, irregular flakes and not from cores. Two specimens stand out from the others because of their thinness, and because their edges show some evidence of secondary pressure flaking. None shows evidence of the billet manufacturing technique.

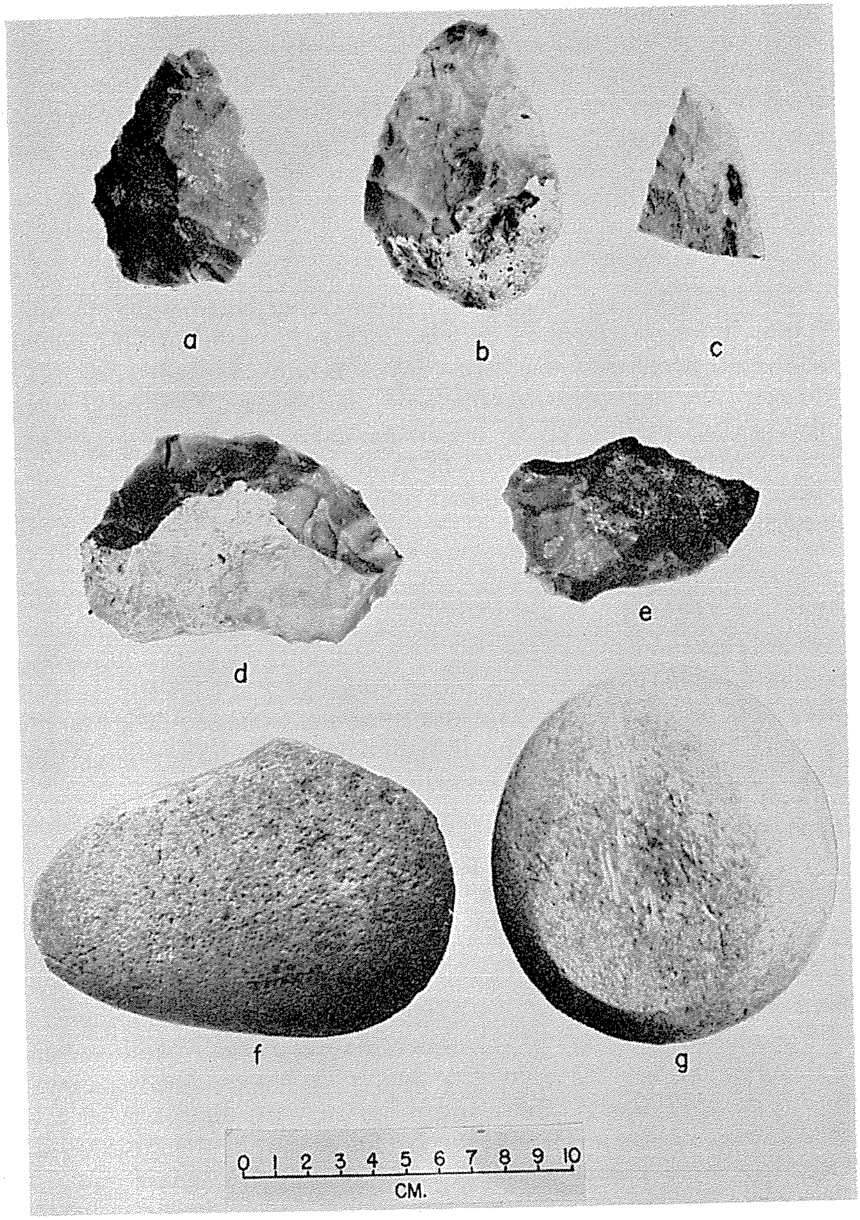

Fig. 7. Artifacts from Devils Mouth site. a-b, fist axes; c, knife fragment; d, chopper; e, initial cortex scraper; f, mano; g, pitted mano.

Scrapers

All artifacts that have a cutting edge or edges worked from only one face of the piece, leaving a flat opposing face, have been included within the scraper category. These, in turn, are grouped in three divisions, following in part the terminological designations used for material from the Centipede and Damp rockshelters by Dr. J. F. Epstein (1960). These are (1) initial cortex flake scrapers, (2) cortex flake scrapers, and (3) scrapers made from flakes that were removed from cores with prepared striking platforms. Unfortunately the descriptive terminology long in use in central Texas and other areas—of which such terms as "end-scraper," "side-scraper," etc., are a part—could not be conveniently employed in describing the scrapers from the Devils Mouth Site. The explanation for this seems to be a difference in techniques of lithic manufacture between this and other areas. The scrapers of the Diablo Reservoir region for the most part are much cruder than those of central Texas and their irregular shape has not lent itself to existing classificatory terms. For this reason the system proposed by Epstein has been used here. His descriptive system is based more on techniques of manufacture than on the shape of the end product.

Initial Cortex Flake Scrapers (Fig. 7: e). Eleven very crude scrapers were made from the initial or outside flakes struck from large nodules or cobbles (see section entitled "Techniques of Flint Knapping." These flakes are generally plano-convex, the convex side representing the original surface of the chert nodule. A small amount of percussion flaking was usually done on the cortex face, but there is rarely any evidence of secondary pressure flaking. These crude scrapers contrast sharply in quality of workmanship with the well made plano-convex scrapers of the central Texas and Abilene regions. Most of the examples show very little in the way of effective cutting or scraping edges, some being worked only on one small part of the edge, while others exhibit irregular percussion flaking around the whole circumference of the artifact. A considerable variation occurs in size, the maximum diameters running from 39 to 74 mm.

Cortex Flake Scrapers (Fig 5: a, b). Sixteen cortex flake scrapers were recovered. These scrapers are made of large, irregularly worked flakes which were struck from medium-sized nodules after removal of the initial flakes. In all instances some part of the cortex of the nodule was left intact, hence the name "cortex flake scraper" (Epstein, 1960). Evidence of a small amount of percussion flaking is found along the edges of many specimens, but only on a limited section of the edge. The average diameter of these artifacts is 55 mm.

Prepared Platform Scrapers (Fig. 5: c). Five rather crude and irregular scrapers were made from flakes struck from the prepared striking platforms of large chert cores. A large bulb of percussion and a small remnant of the striking platform can be seen on all the specimens. The general outline of these scrapers is quite irregular, but the "sharpening," done by percussion, is found generally on the end opposite the bulb of percussion. In all instances retouching is found only on one face. The average diameter of these scrapers is 55 mm.

Miscellaneous Scrapers. Aside from the aforementioned scrapers, three others were found which did not fit any of the above categories. The first of these is long, approximately rectangular, and was made from a flake struck from the flat, unworked surface of a nodule. This artifact has a square bit at the end opposite the striking platform and perhaps was used as an adz or gouge. The other two scrapers are very similar in outline to the leaf-shaped knives discussed earlier, differing only in that one face is flat and unworked.

Ground Stone Artifacts

Eleven *manos*—hand stones used for grinding purposes—were found at the site. Of these, four are very flat, showing smoothed areas resulting from use on both faces. Two (Fig. 7: g) have small, pecked areas on their surfaces and resemble strongly the so-called "nut stones" or "pitted stones" of eastern Texas (Jelks and Tunnell, 1959: 50; Suhm *et al.*, 1954: 207). Another hand stone (Fig. 7: f) has only one grinding surface; the back is sharply humped and ridge-shaped. Aside from these complete *manos*, six fragments of *manos* were found; unfortunately it is not possible to be certain of the original shapes. On three specimens one broken edge has been sharpened by percussion flaking, and it seems probable that they were reused as choppers.

Miscellaneous Stone Material

Nineteen small, elongate river pebbles occurred at the site, similar in form to the painted pebbles characteristically found in the dry caves of western Texas. The specimens from the Devils Mouth Site may originally have had paintings on their surfaces which weathered away as a result of the exposed nature of the site. Several fragments of ochre (limonite and hematite) were also recovered from the excavations.

UNALTERED FLAKES

Unworked flakes of the four major forms (i.e., initial flakes, cortex flakes, prepared platform flakes, and billet flakes) were found in practically all the excavation levels. Because many of the flakes recovered were broken and of a minute size, the writer could not make accurate statistical counts of the flakes for the various stratigraphic levels. From a cursory examination, however, it seems that both cortex and billet flakes are very common in all the levels excavated, while the prepared platform flakes are rare. Initial flakes are also common, but most of them have been worked and utilized as scrapers.

POTTERY

Three small potsherds (Fig. 6: q, r, s) were recovered from the upper levels of Test 2. Their surfaces are smooth, but not polished, and of a tan or cream color. The hardness of the surface is between 2.5 and 3 on Moh's scale. The paste is of the same color as the exterior, and is porous and soft. Abundant bone fragments, clay lumps or ground potsherds, and a small amount of sand constitute the tempering materials. Two of the sherds measured 7 mm. in thickness, the other 8 mm.

These sherds are similar, except for their lighter color, to sherds of type *Leon Plain* found at the Oblate Site in central Texas (C. D. Tunnell, personal communication). The affiliations of the sherds from the Devils Mouth Site as well as the type *Leon Plain* from central Texas seem to lie with the Caddoan ceramic tradition of the southeastern United States, as evidenced by the paste, tempering agents, and softness of the surfaces.

Provenience of the Artifacts

Even though the number of artifacts recovered from the three test excavations is relatively small, there are some rather interesting differences in the vertical distribution of the types represented. Because of the small size of the sample these stratigraphic data are not statistically conclusive, yet they clearly point out several possibilities which future work at the site should be able to verify or reject.

The artifacts and their distribution will be presented here by areas: Tests 2, 1, and 3 respectively.

Test 2 (see Table 1) provided by far the largest sample of artifacts and the greatest amount of distributional information. In all, 67 arti-

TABLE 1

Provenience of Artifacts
Test 2

Montell dart points	*Provisional Type A* dart points	*Provisional Type D* dart points	*Provisional Type D* dart points	*Shumla* dart points	*Frio* dart points	*Abasolo* dart points	Arrow points	Burin	Fist axes	Initial Flake Scrapers	Prepared Platform Scrapers	Cortex Scrapers	Bifacial Knives	Potsherds	*Manos*	Depth (Ft.)
..	2	..	..	..	..	..	1	..	..	1	1	..	..	1	..	0.0–0.5
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0.5–1.0
..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1.0–1.5
..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	1.5–2.0
..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	1	2.0–2.5
..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2.5–3.0
..	2	..	..	..	..	..	1	1	..	..	..	2	..	..	..	3.0–3.5
..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	3.5–4.0
1	1	..	..	..	1	..	..	..	..	..	..	1	1	1	..	4.0–4.5
..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	4.5–5.0
3	..	..	..	..	..	..	..	..	1	1	2	4	1	..	..	5.0–5.5
5	..	..	..	..	..	..	..	..	1	..	..	2	2	..	..	5.5–6.0
3	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	6.0–6.5
..	..	..	..	1	..	..	..	..	..	..	..	..	4	..	1	6.5–7.0

facts were recovered from this pit. The excavations at Test 2, reaching a depth of 7 ft. below the surface, were limited to Zones A through C as defined from the three profiles of the terrace face (Fig. 3). Although this test pit was put down only a short distance from the edge of the terrace near Profile 3, the zoning encountered correlated only roughly with that of Profile 3. It could be determined, however, that the strata of the pit corresponded to Zones A through C, although the constituent beds and lenses were not comparable to the five divisions of Zone C which appeared in Profile 3.

With regard to the provenience of the artifacts from Test 2, there were some interesting differences in the occurrence of several dart point types, the arrow points, and the potsherds. The main utilitarian artifacts, however, showed no important change in styles from the bottom to the top of the column, indicating a certain degree of cultural uniformity for the whole period of occupation evidenced by Test 2. On the basis of the differences in the distribution of artifacts mentioned above, two tentative periods are hypothecated for the site on the basis of Test 2 (Table 1):

Period I, representing the artifacts found from depth 4.5 ft. to 7 ft. below the surface, is characterized by the *Montell* dart point type (11 specimens), and *Provisional Type A* dart points (2 specimens). One *Shumla* point was found in the lowest excavation level. The only burin recovered was associated with artifacts of this period.

Period II, represented by the artifacts found from the surface to a depth of 4 ft., is characterized by *Provisional Type C* dart points (7 specimens), three arrowheads (*Perdiz, Toyah,* and an unclassifiable, fragmentary specimen), and the three potsherds. Also occuring in Period II are one dart point of *Provisional Type D* and one *Abasolo* point.

The half-foot excavation level 4.0–4.5 ft. falls between the two periods, and seems to represent a mixture of them. In it were found one *Montell* point, one point of *Provisional Type C,* and one *Frio* point.

Running through the whole stratigraphic column, but somewhat more frequent in the lower zones, are bifacial knives, initial flake scrapers, prepared platform scrapers, and cortex scrapers.

Viewing this tentative periodification of the site *in toto*, then, it seems that we have a more or less consistent culture pattern represented from the lowest stratum to the highest, characterized by the knives, sundry scrapers, and *manos*. In Period I the *Montell* dart point seems to have been the dominant type, while in Period II it was apparently replaced by *Provisional Type C,* and arrow points and pottery were added to the general culture. Based on our knowledge of culture history from other areas, it would seem possible that the arrow points and pottery were intrusive into Period II, and do in themselves represent a latter occupation of the site by people of the Neo-American Stage. Data to substantiate this assumption, however, are not present, and these artifacts can not be factored out of Period II without further evidence.

We do not have to assume that the site was necessarily occupied continuously, even at the time during which Zone C was being built up, a period of time which seems to have been relatively free from flooding. Rather it is quite possible that the site was used only intermittently by bands of roving food-gatherers and hunters, possessing similar, but not identical artifact assemblages. This is one possible way to account for the difference in the distribution of the various dart point types and to account for the presence of the potsherds in Period II.

Unfortunately very few artifacts were recovered from Tests 1 and 3 and their provenience is not presented in the tables.

In Test 1, which extended from Zone A through Zone E, were found 4 bifacial knives, 2 cortex flake scrapers, 6 initial cortex flake scrapers, 2 *Provisional Type C* dart points, one *Langtry* point, and 8 *mano* fragments. Except for two initial cortex flake scrapers from Zone E, all the artifacts came from Zone C, but the column can not be broken into two periods, as at Test 2. The two *C* dart points and the one example of *Provisional Type D* might suggest affinity with Period II.

In Test 3, only 6 artifacts were recovered: 2 knife fragments, 1 prepared platform scraper, 1 *Provisional Type D* dart point, 1 *Abasolo* dart points, and 1 *mano*. Test 3 included Zones A through C.

On the surface of and along the base of the terrace were found one *Pedernales* point, one *Provisional Type A* and two *Provisional Type B* dart points as well as sundry scrapers, *manos*, and other miscellaneous artifacts.

Faunal Remains

In the course of excavation, a few animal bones and bone fragments, a few mussel shells, and a large quantity of snail shells were recovered. These were kindly identified by Mr. Holmes A. Semken of the Vertebrate Paleontology Laboratory of The University of Texas, and their generic names are presented below. Unfortunately, identification could not be made on the specific level because of the fragmentary nature of the remains.

Two genera of snails were recognized, *Bulimulus* spp. and *Polygyra* sp., the former occurring in all levels of the three test excavations, while the latter was much less common, occurring primarily in the upper levels of Test 1. Small mussel shell fragments (*Unio* sp.) were also found in quantity throughout the site, but were not nearly so common as *Bulimulus*.

The few bone fragments represent two genera of hares (*Lepus* and *Sylvilagus*), two genera of rats (*Neotoma* and *Sigmadon*), and deer (*Odocoileus*). Several bones of snakes and fish were recovered as well. Most of the bone material came from Test 2, the excavation made in the rich midden area, although a few bones were found in Tests 1 and 3. Distribution studies by depth revealed no important differences in the relative percentages of the various genera except for *Polygyra*, which was more common in the upper levels of Test 1.

The large number of snails may suggest that these small animals were gathered and used for food. Such was certainly the case in many of the sites of the Edwards Plateau Aspect of central Texas. It may be assumed that the various animals represented were also used for food, although the rat bones may possibly represent debris from burrows.

Cultural Affiliations

The assemblage of artifacts from Period I at the Devils Mouth Site consists of *manos*, crude knives and scrapers, fist axes and dart points. Later, in Period II (as defined in Test 2) arrow points and pottery appear and the dart point forms are different from those in Period I; but there seems to be a continuity of knife and scraper forms throughout the whole period of time represented in Test 2.

We have a picture, then, of a hunting-gathering people (or peoples) who probably utilized the animal and plant foods of their environment quite efficiently. That they were hunters is attested by the presence of deer, small mammal, and rodent bones, and that they were food-gatherers can be inferred from the *manos*, bedrock mortars, and abundant snail and mussel shell. Fishing seems also to have been practiced.

Projectile points have been used throughout North America as "index fossils," or as keys to cultural classification, and it is to these artifacts that we must turn to make some inferences regarding possible affiliation of the Devils Mouth materials with defined archeological culture units. The projectile points of Period I (Test 2) are of the Archaic Stage, specifically the Edwards Plateau Aspect of central Texas, a division of the Balcones Phase as defined by J. Charles Kelley (1947, 1959). Kelley earlier (1947: 124–125) divided the Edwards Plateau Aspect into three foci—Round Rock, Uvalde, and Clear Fork—defined primarily on the basis of dart point types.

Period I at the Devils Mouth Site shows strong affinity with the Uvalde Focus, which is characterized by dart point types *Montell*, *Frio*, *Smithwick Small Stem* (Kelley, 1947: 124). *Montell* is the most common dart point type from the lower levels of Test 2. According to Kelley (1959: 282), the Uvalde Focus is relatively late in the Archaic Stage of central Texas and correlates on a time level with the Chisos Focus of the Big Bend area. Since the validity of the Uvalde Focus as a culture unit has not as yet been demonstrated in print, it can only be suggested here that Period I relates to it.

There are two possible ways to interpret the material represented by Period II: (1) two distinct occupations, one by late Archaic and the other by Neo-American peoples, are present but stratigraphically inseparable, or (2) Period II belongs exclusively to a Neo-American Stage culture that used *Provisional Type C* dart points as well as arrow points and pottery. The *Perdiz* type arrow point (of which one specimen was found in the Period II level) is common both in central and western Texas; the *Toyah* type arrow point occurs in many Neo-American sites of Trans-Pecos Texas.

The materials represented by Periods I and II from the Devils Mouth Site contrast somewhat with the nearby Pecos River Focus sites of Diablo Reservoir, primarily in the relative percentages of dart point types. Only one each of dart point types *Shumla* and *Langtry*, characteristic of the Pecos River Focus, were found at the Devils Mouth Site. The *Shumla* point occurred in the deepest part of Test 2, below the *Montell* points, while the *Langtry* point came from Test 1.

Conclusions

The following conclusions have been reached regarding the Devils Mouth site:

1. At least 8 occupational zones, separated by sterile alluvial beds, have been identified in the terrace.
2. Excavation of the uppermost of these zones (A through C) yielded an assemblage of artifacts divisible into two tentative culture periods.
3. Period I, characterized by a high frequency of *Montell* points, shows strong affiliation with the Uvalde Focus of the Edwards Plateau Aspect.
4. Period II, characterized by *Provisional Type C* dart points, and including arrow points and pottery, may represent (1) a late or transitional Archaic occupation within intrusive pottery and arrow points; (2) occupation by Neo-American peoples that used dart points, arrow points, and pottery; or (3) intermittent occupations by both Archaic and Neo-American cultures.
5. The affinity of the excavated portion of the site is with central Texas more so than with western Texas, especially in Period I.

In view of the clear-cut stratigraphy in the terrace, it is strongly recommended that more extensive work be done at the site. The possibility of obtaining good cultural stratigraphy appears excellent since many more occupation zones occur below the ones analyzed in this report.

The presence of a *Shumla* type dart point near the bottom of Test 2 suggests that the deeper occupational levels, not excavated in 1959, may well contain remains of the Pecos River Focus. Consequently, further work at the Devils Mouth Site might well provide significant data on chronological and other relationships between the Uvalde and Pecos River foci. Such data would be of considerable importance in reconstructing the prehistory of the Devils River area.

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The Boggy Creek Sites of Washington County, Texas

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Introduction

AN ARCHEOLOGICAL survey of the Boggy Creek area was initiated in July, 1955, when mention of it was made by Nathan L. Winfield, Jr. of Chappell Hill, Texas. The Boggy Creek sites (53D5-2) are located ten yards west of Farm Road 1155 at Long. 96° 15′ and Lat. 30° 12′, approximately fourteen miles east of Brenham, Texas.

The initial phase of work done at Boggy Creek involved locating the main shell midden and testing and locating several nearby sites in the immediate area. In August, 1955, Dee Ann Suhm and Rudolph C. Troike of The University of Texas visited the Boggy Creek area and aided in the work. This basic phase culminated in the partial excavation of the largest site in November, 1955.

The archeology of the surrounding area is very poorly known. Several small sites have been located, but only at the Boggy Creek sites have large shell middens been found. "Occasional collecting of projectile points has been under way there since before World War I," relates Henry Hughes, a local landowner familiar with the region.

Henry Stzeleske, the present owner of the Boggy Creek sites reports that, "the hill has always bothered people and in the past several have dug for gold in it. The time selected for digging was always at night when the moon was full. Whiskey was poured in a circle around the area to be dug and then set afire. The fire and the whiskey were to keep away evil spirits. No one has ever found any gold." Since the late 1800's, this locality has been populated by Polish immigrants and their descendants. The folklore of these people about hidden gold is still strong and there are four or five favorite spots which are believed to contain Indian or Spanish gold.

The landowner's family was told that they could have all the gold found as a result of the excavations, and at least one member of the family was always present while this work was being carried out.

Henry Stzeleske further relates that, "because no crop will grow on that hill my family has left it alone." As for projectile points found, he states that he has collected "two shoe boxes of arrow points in the past and sold them to strangers." Projectile points that members of his family have found in the fields used for crops "were broken, because they will get wedged in the horses' hoofs."

Geology and Topography

The surface of this general area is composed of overlapping formations that dip in the direction of the Gulf of Mexico, which is about eighty miles away. Boggy Creek is located on the edge of the coastal plain, and is a tributary to New Year Creek, a small stream that flows into the Brazos River from the west. The present land surface is of Pleistocene, Oligocene System and Gueydan group origin. The strata of the Gueydan group are largely pyroclastic sediments consisting of light-colored ash, tuff, and tuffaceous clays interbedded with lentils of quartzitic sand and conglomerate (Sellards, Adkins, and Plummer, 1954: 700).

The topography of this region is characterized by rough, rolling, and dissected terrain about twenty miles wide and located west of the Brazos River in Washington County.

The stream course of Boggy Creek is fringed with large, old trees and a discontinuous natural levee of sand and silt. This stream joins New Year's Creek, which flows into the Brazos River approximately four miles away. During flood periods, this stream frequently overflows its banks and inundates wide areas of bottomland, so that the natural knolls upon which the two larger sites are located are the only land above water. Perhaps for this reason these locations were selected by the Indians as places of habitation.

The center of the larger knoll (53D5-2A) was completely excavated during the 1930's by the Texas Highway Department (see Fig. 1). The dirt which was removed from the heart of the knoll was used to fill county roads. This excavation greatly impaired future archeological work.

The Historic Indians of the Boggy Creek Area

The Boggy Creek sites are located on the edge of the northern geographic range of the Akokisa Indians. The Han or Akokisa, occu-

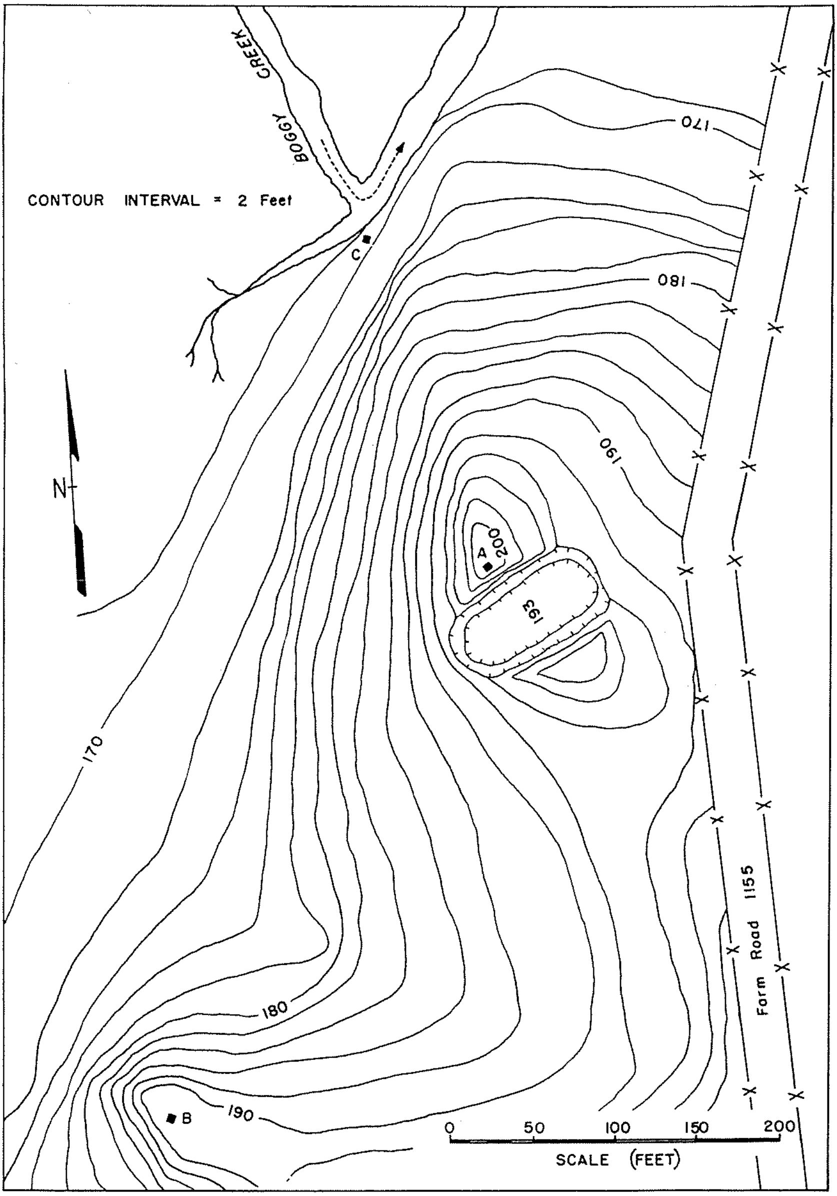

Fig. 1. The Boggy Creek sites, showing the Central Midden (53D5-2A), the South Knoll (53D5-2B), and the Creek site (53D5-2C). Map drawn by Arthur Al Geick, civil engineer, Brenham, Texas.

pied the eastern end of Galveston Island while the Capoques (Cocos) of Karankawa affiliation lived on the western end of the island. From Orobio Bazterra's information, the location of four or five groups of Indians in this general area can be made. The Bidai, who occupied the area around Huntsville, Texas, informed Orobio that the Akokisa ranged from the Neches River to a point halfway between the Trinity and Brazos. The Mayeye (Tonkawa) lived west of the Bidai, and south of them, toward the coast, lived the Cocos. By 1779, these tribes had united and could be found on the coast between the Colorado and the Brazos. Occupying the coast, westward from the mouth of the Brazos, were the Karankawa (Wheat, 1953: 160–161).

Other Indian groups occupying Washington County included the Wacos, on the northern border of the county. Situated between the Wacos and the Akokisa were the Tonkawa proper. In the west and southwestern sections were the Tamique and the Xarame.

The Akokisa and related tribes depended upon hunting, fishing, and food-gathering as their main subsistence. Larger game such as deer and bear were often hunted. De Bellisle mentions the gathering of bird eggs in quantity, and the use of shellfish as food. Many local types of flora were also utilized by these Indians (Wheat, 1953: 161).

Cannibalism is said to have been practiced by the Akokisa, but was not economically important to them. Only one human bone was found in the Boggy Creek sites.

No accurate data exists as to the exact house type used by the Akokisa. Orobio Bazterra mentions that the winter habitations of the Bidai were bear-skin tents. Because of the geographical closeness of the Akokisa and their affiliation with the Bidai, perhaps some similar type of impermanent structure was used by the Akokisa.

Pottery was used by the Akokisa, but descriptive details are lacking. Much of the pottery used by them came from trade with other Indians rather than being of local manufacture (Wheat, 1953: p. 162).

Since flint is not common in the Boggy Creek area, it also probably came to these people as a result of trading or was transported to the sites by them. The most common flint found is similar to flint found in large quantities in the northwestern section of Washington County in the region occupied by the Tonkawa. However, other varieties of flint were found in the excavations.

Description of the Boggy Creek Sites

Three sites (Fig. 1) were recorded during the survey of the Boggy Creek area. Two of these sites occupy high knolls south of Boggy

Creek. These are the Central Midden (53D5-2A) and the smaller South Knoll (53D5-2B). The third site, named the Creek Site, 53D5-2C) is located at the base of the larger knoll (Central Midden) on the banks of Boggy Creek. Other sites reported to exist in this region could not be verified upon investigation.

Central Midden(53D5-2A). As mentioned, this midden has been the victim of much indiscriminate digging, collecting, and road work excavation. On the northern slope there remain many shallow depressions, all less than one foot in depth, possibly the result of digging by both man and animals. The site itself is completely exposed and devoid of any flora with the exception of several local types of grasses. One of its outstanding characteristics is the presence of innumerable mussel shells.

The area for excavation was selected because the surface had the appearance of having been undisturbed and the dig would cut through the maximum depth of the midden. A grid system of four-foot squares was staked off, and excavation was done by levels of 35 cm. Originally smaller levels were planned, but the low yield in artifacts prompted a change to 35 cm. levels. All material was screened and the artifacts were segregated by square and level. Depth was measured from the surface at the level of the designator stake for that square.

The soil of this site consists of a loose, sandy, dark-colored mixture of varying proportions of clay. No definite stratification could be seen. Numerous flint flakes, bone fragments, mussel shells, and small gastropod shells were found in each level. Mussel shells in all levels frequently showed the effects of fire, but fire-fractured rocks (hearthstone fragments) were noted only in levels 4 and 5.

Arrowpoints (Perdiz and Scallorn) were confined to the top level (see Table 1), in which dart points of types Gary, Morrill, and Palmillas also occurred. Below the top level only dart points were found, but potsherds were collected from all levels. Gary points are represented in all levels. Kent and Pedernales points were found only in the three lowest levels (3, 4, and 5); and Edgewood, Ellis, and Ensor points occurred only in levels 2 and 3. Yarbrough points were clustered in intermediate levels (2, 3, and 4). Other chipped flint artifacts (gravers, knives, scrapers, and choppers) show no significant vertical distributions.

South Knoll (53D5-2B). This is located about 450 feet south of the Central Midden and is 10 feet lower in elevation. Here cultural debris is thickest in the central portion of the knoll, thinning out towards the perimeter. As at the Central Midden, no plants except native grasses

TABLE 1

Chipped Stone Artifacts from Central Midden

	Levels 1 0–35	2 35–70	3 70–105	4 105–140	5 140–160
Projectile points					
Edgewood	..	..	1	..	..
Ellis	..	1	..	..	..
Ensor	..	..	1	..	..
Gary	1	1	3	2	1
Kent	..	..	3	2	4
Lange	..	..	..	..	1
Morrill	2	..	..	..	1
Palmillas	2	3	..	..	2
Pedernales	..	..	..	4	1
Perdiz	3	..	..	..	..
Scallorn	4	..	..	..	..
Yarbrough	..	2	1	1	..
Unclassifiable frags.	..	3	..	..	..
Gravers	5	1	1	..	2
Knives	1	1	..	2	1
Scrapers					
End-scrapers	..	..	..	..	1
Side-scrapers	1	1	1	..	6
Chopper	..	..	..	1	..
Unclassifiable	..	..	..	..	12

grow on the surface. Prior to excavation only a few mussel shell fragments could be seen on the surface.

The same excavation procedure was followed as is described above for the Central Midden. The top layer consists of a tan, sandy soil with a maximum thickness of eight inches. Below is a dark, sandy midden deposit having a maximum thickness of 10 inches, and this stratum produced all of the artifacts found at this site. Below the midden is a very thin (one-inch) layer of white sand, which in turn lies upon limestone bedrock.

The dark midden zone contained numerous deer bones, one antelope tooth, and also one human bone. Mussel shells were rarely encountered. Included in the midden were Lange, Morrill, Pandora, and Pedernales dart points, two knives, and part of a large ceremonial knife or blade. No arrowpoints or potsherds were encountered. The remainder of the artifacts consisted of gravers, scrapers, and miscel-

TABLE 2

Chipped Stone Artifacts from South Knoll

Projectile points	
Lange	5
Morrill	1
Pandora	1
Pedernales	6
Unclassifiable point fragments	6
Gravers	4
Knives	2
Knife or blade, ceremonial	1
Scrapers	
End-scrapers	1
Side-scrapers	5
Unclassifiable fragments	17

laneous flint flakes. Frequencies of the classes and types of artifacts are given in Table 2.

Creek Site (*53D5-C2*). This is located near the main channel of Boggy Creek about 200 feet north of the Central Midden. The site is a small oval midden that rests on a sandy natural rise on the east bank of Boggy Creek at the point where the stream makes a 90° turn to the northeast. The midden is about 12 feet long (north-south) and nine feet wide.

Human occupation was indicated by surface debris—hearthstone fragments, animal bones, mussel shells, and a few artifacts (gravers, scrapers, heavy bifaces, a chopper, and one unshaped grinding slab).

A small test pit was dug in order to determine the thickness of the midden deposit. From the grass roots to a depth of 1.8 feet sparse camp debris occurred in a dark, sandy soil. In this zone (see Table 3) were both arrowpoints (Perdiz and Scallorn) and dart points (Ellis and Kent), gravers, knives, scrapers, heavy bifaces, a chopper, a hand stone, and a few potsherds. The only identifiable animal bones consisted of an antelope tooth and a fragment of deer bone. Although animal bones were very rare, mussel shells were numerous in this midden deposit.

Below 1.8 feet to a depth of 3 feet (limit of excavation) no artifacts were encountered. This zone contained less sand and was somewhat more consolidated than the midden zone above it.

TABLE 3

Stone Artifacts from Creek Site

	Surface	*Level 0–45 cm.*
Projectile points		
Ellis	–	2
Kent	–	2
Perdiz	–	1
Scallorn	–	2
Unclassifiable fragments	–	5
Gravers	11	6
Knives	–	3
Scrapers		
End-scrapers	2	2
Side-scrapers	5	1
Heavy bifaces	2	1
Choppers	1	1
Unclassifiable chipped flint	–	4
Hand stone (milling tool)	–	1

Food Remains at the Boggy Creek Sites

Throughout the period of occupation represented by the Boggy Creek sites fresh-water mussels were consistently and abundantly used for food. The only exception is South Knoll, where mussel shells were rare. Deer was probably the second most important local source of food. In the Central Midden deer bones (see Table 4) were found at all levels, although the concentration in level 5 was heavier than in the four levels above. In the South Knoll site (see Table 5) there was much less bone refuse than in the Central Midden, but it was concentrated at depths between 8 and 18 inches. Excavation at the Creek site yielded no animal bones, yet three fragments were collected from the surface, one an antelope tooth and the others probably from deer. Although the excavation sample is small at the Creek site, it would appear that the occupants relied more on mussels than deer for food. The rarity of antelope remains suggests that it was not commonly used for food. As only one human bone occurred at the three sites, it is an open question as to whether this indicates cannibalism. The low frequency of milling tools at the Boggy Creek sites suggests that certain plant foods were not commonly utilized in the immediate area.

TABLE 4

Deer (*Odocoileus*) Bones from Central Midden

Level 1 (0–35 cm.)	
Long bone fragments	2
Long bone fragments (humerus?)	2
Flat bone fragment (pelvis?)	1
Level 2 (35–70cm.)	
Femur	1
Long bone fragments	2
Bone fragment with tendon sheath markings	1
Level 3 (70–105 cm.)	
Vertebra, body fragments	3
Patella	1
Long bone fragments	2
Unclassifiable fragments	4
Level 4 (105–140 cm.)	
Parietal fragment	1
Tibia, shaft fragment	1
Unclassifiable fragments	6
Level 5 (140–160 cm.)	
Parietal fragments	2
Vertebra, body fragment	1
Scapula fragments	
Articular surfaces	2
Body	1
Femur fragments	
Shaft	2
Articular, distal	1
Tibia fragments	
Articular, proximal	2
Shaft	2
Miscellaneous long bone fragments	14
Additional long bone fragments, burned	2
Unclassifiable fragments	6

TABLE 5

Animal Bone from South Knoll Site

Antelope (*Antilocapra*)	Tooth	1
Man (*Homo sapiens*)	Femur	1
Deer (*Odocoileus* sp.)		
Parietal fragment		1
Vertebra, body fragment		1
Scapula, body fragments		2
Humerus, fragments		4
Tibia		1

Ceramics

A total of 14 potsherds was found at the Boggy Creek sites, seven in the Central Midden and an equal number in the Creek site. These sherds appear to fall within the type defined as Goose Creek Plain (Suhm, Krieger, and Jelks, 1954: 378–380).

All of the sherds are small body sherds (Fig. 2, J) and give no indication of vessel forms. Possibly some three to five vessels are represented, judging from wall thickness, temper, and other criteria. Wall thickness ranges from 5 to 9 mm., with an average of 6 mm. Seven of the sherds are sand-tempered, and the remaining seven also include pulverized bone in small amounts. Of the seven sherds from the Central Midden, three show pulverized bone; and of the seven from the Creek site, four show pulverized bone. Paste texture ranges from coarse to fine and rather compact. Surface color ranges from orange-red through brown, brownish-gray, dark gray and black; core color ranges from orange-red to black. Both surfaces (interior and exterior) have been smoothed.

The sherds from the Central Midden were well distributed through the midden deposit—Level 1 (top), one sherd; Level 2, one sherd; Level 3, two sherds; Level 4, one sherd; and Level 5, two sherds. Bone temper was noted in one sherd each from Levels 2, 4, and 5. It would appear that pottery was used throughout the occupation of the Central Midden and that pottery came into use before the introduction of the bow and arrow. The same situation occurs in the Addicks Reservoir some 40 miles southeast of the Boggy Creek sites (Wheat, 1953: 243).

Stone Artifacts

Projectile points from the Boggy Creek sites have been classified according to the *Handbook* (Suhm *et al.*, 1954). Most of the points have also been examined by T. N. Campbell and Dee Ann Suhm of The University of Texas. No new or provisional types were found at the Boggy Creek sites.

The types of projectile points found in each of the three sites are listed in Tables 1–3 (see also Fig. 2, A-K). Analyses of these artifacts and their stratigraphic positions permit certain conclusions to be drawn about the probable sequence of occupation in the Boggy Creek area.

Arrowpoints, which appear only in the upper part of the Central Midden and in the Creek site, evidently represent the latest phase of

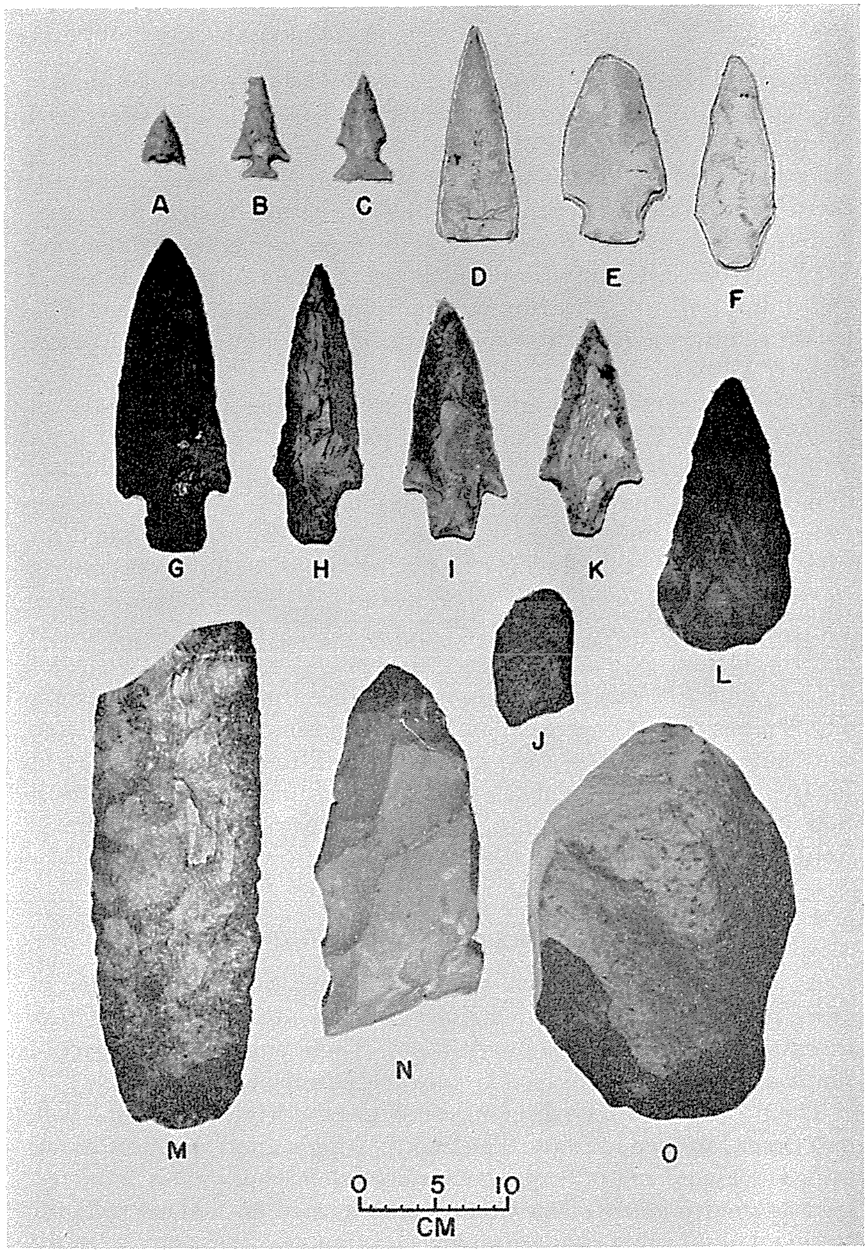

Fig. 2. Artifacts from the Boggy Creek sites. A, Perdiz point; B, Scallorn point; C, Ellis point; D, Pandora point; E, Palmillas point; F, Morrill point; G, Lange point; H, Kent point; I, Pedernales point; J, potsherd; K, Gary point; L, knife; M, ceremonial knife; N, heavy biface fragment; O, hand ax. Provenience: Central Midden—E, J, K; South Knoll—D, F-G, I, L-M; Creek site—A-C, H, N-O.

occupation. These arrowpoints (Perdiz and Scallorn) were confined to the top level in the Central Midden (see Table 1), but a few dart points (Gary, Morrill, and Palmillas) also appeared in the same level. Below the top level only dart points were found; however, some potsherds were collected from each of the five levels. Lange, Kent, and Pedernales points were found only in the three lowest levels (3, 4, and 5). Edgewood, Ellis, and Ensor points were found in higher levels (2 and 3, but not in 1), bearing out the common supposition that side-notched and corner-notched points are relatively late in the Archaic Stage of Texas.

Other lithic artifacts from the Boggy Creek sites (Fig. 2, L-O) include knives (11 specimens), heavy bifaces (3), choppers (3), end-scrapers (6), side-scrapers (20), gravers (20), miscellaneous chipped flint fragments and unclassifiable specimens (33), and hand stones (1). As most of these classes of artifacts occurred in each of the three sites, it is believed that they are best referable to Archaic occupations. In the Central Midden, with some measure of vertical control, there seemed to be no significant stratigraphic segregation of any of these artifact classes.

In October, 1960, after this report had been prepared, four lanceolate knives (Fig. 3) were exposed by erosion in the road cut through the Central Midden. As these knives were all found at one spot, it is likely that they represent a cache. They differ from other knives found at the Boggy Creek sites, and their status cannot be determined until further work is done in the area.

Summary and Conclusions

As a result of archeological survey work and limited excavation in 1955, information has been obtained on three sites near Boggy Creek in eastern Washington County, Texas. These sites are in a part of southeastern Texas that is poorly known archeologically.

The three sites, which are designated Central Midden, South Knoll, and Creek, are midden sites. The Central Midden and Creek sites contained an abundance of fresh-water mussel shells and can be characterized as shell middens. The Creek site is located on a slope near the stream, but the other sites are on low elevations farther away from the stream. No structural features or burials were encountered during excavation at these sites.

The Central Midden, although badly disturbed, yielded the best information on the sequence of human occupations along Boggy Creek.

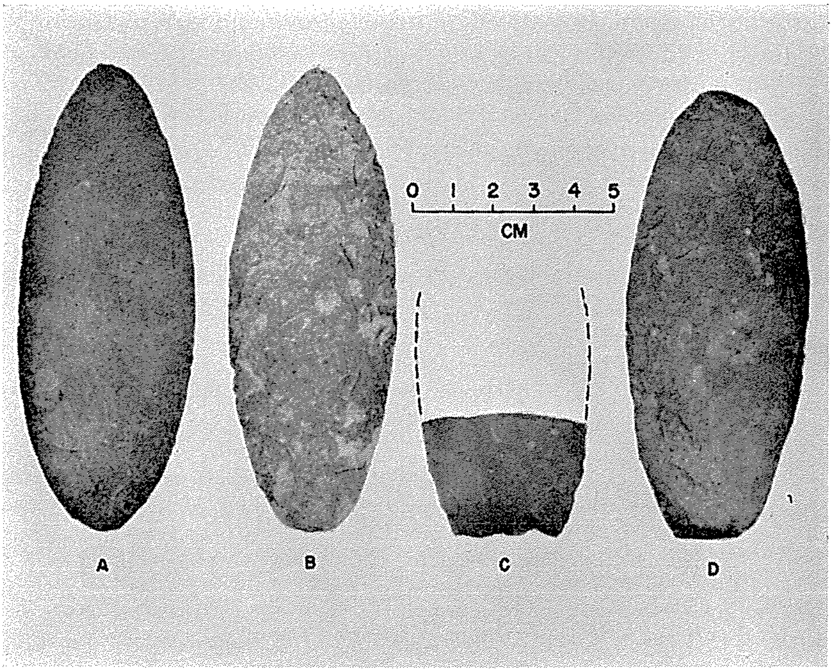

Fig. 3. Three knives and basal fragment of a fourth knife found on the surface in October, 1960, on the road cut through the Central Midden. Apparently this was a cache of knives, as all four artifacts were found together.

Its lower levels contained artifacts, particularly dart points, attributable to the Archaic Stage, but small amounts of pottery indicate a transition from the Archaic to the Neo-American Stage. Only in the uppermost level did arrowpoints occur. The appearance of pottery before the bow and arrow duplicates a similar sequence reported in the Addicks Basin some 40 miles to the southeast. The undecorated pottery from the Central Midden appears to be Goose Creek Plain, which was found abundantly, along with Goose Creek Incised, in the Addicks Basin sites (Wheat, 1953).

The Creek site yielded undecorated pottery and arrowpoints, as well as late Archaic styles of dart points, and presumably had the same occupational history as the Central Midden. The South Knoll site, however, contained no pottery and no arrowpoints and appears to represent occupation earlier in the Archaic Stage than at the other two sites.

The various peoples who lived along Boggy Creek seem to have lived by hunting, fishing, and food collecting. No evidence of horticulture was found. Presumably a seasonal abundance of natural food products in the Boggy Creek area led to repeated occupations of these three sites over a considerable span of time.

Acknowledgment. Animal bone identifications from the Boggy Creek sites were made by Robert A. Hasskarl, M.D.

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Researches in Coahuiltecan Ethnography[1]

BY RUDOLPH C. TROIKE

THE TERM "Coahuiltecan" is applied ethnologically to a number of linguistically related bands of nomadic hunting-and-gathering Indians who ranged through southern Texas and northeastern Mexico until the beginning of the 19th century. They belonged to the area referred to by Swanton (1940) as the "ethnographic sink," which was inhabited by groups with relatively simple, subsistence-oriented cultures. Due to the extremities of their environment and the limitations of their technology, the Coahuiltecans were obliged to spend most of their time in search of enough food to allow of bare survival. They had to move frequently as the available food resources were exhausted quickly in any one locale. As a result their inventory of material culture items was largely restricted to what they could easily carry with them.

The entry of Spanish missionaries, settlers, and soldiers in the area had an enormous impact upon the Coahuiltecans. Those who survived European diseases, forced labor, and war were gradually Mexicanized and were largely assimilated by the end of the 18th century.

Except for the work of Anderson (1932), archeological interest in the Coahuiltecan area has been rather recent and excavation has been limited to only a few places. Sites in this area are usually campsites which were apparently occupied only for short periods of time, and material remains are scanty, so that excavation does not yield very rewarding results. The work of Krieger (Suhm, Krieger, and Jelks 1954: 134–143) at Falcon Reservoir and of MacNeish (1958) in Tamaulipas has added a great deal to our knowledge of Coahuiltecan archeology, but much remains to be done before an integrated picture can be drawn.

Archeology and ethnology often complement one another in the re-

[1] I should like to express my appreciation to my wife, Nancy P. Troike, for her assistance in the translation of the Spanish passages and for the preparation of the manuscript.

construction of extinct cultures. Archeology provides information about aspects of a people's culture or way of life often omitted from the best contemporary accounts. On the other hand, archeological interpretations of cultural materials often depend upon extrapolation from ethnographic data, which also tell of many non-material or perishable cultural features not preserved in the archeological record. Unfortunately, information on Coahuiltecan culture is quite limited since few Spanish writers considered it worthy of remark. Consequently almost any observation on Coahuiltecan customs by a contemporary source, no matter how brief, is of interest and value.

The principal sources on Coahuiltecan ethnography, Alonso de León (1909) and Vicente Santa María (1930), have been available in published form for some time, and the information which they and a few others recorded has been thoroughly analyzed (Ruecking 1953, 1954a, 1954b, 1955). However, a small amount of additional information is to be found in scattered notes among civil and ecclesiastical documents preserved in various archives in Mexico. Considering the fragmentary nature of the materials and the time and difficulty required to uncover them, it seems desirable that such data be translated and published in full so as to make them freely available to other workers in the field. The following notes concern just such material and help to supplement the information on the Coahuiltecans provided by De León and Santa María.

Ruecking (1955: 370) has observed that polygamy is frequently mentioned in early historic accounts, but the specific form is rarely indicated. It should be noted that De León (1909: 52) describes both the sororate and levirate, as well as an unusual marriage involving both mother and daughter:

> They do not observe degrees of affinal relationship, [and] of consanguinity, very few; they are accustomed for an Indian to have a daughter and mother at the same time, and two or three sisters and other very close [female] relatives, without scruple or novelty, and also those women whom his brothers have had, the same law running for the [women] as for the [men].

Ruecking (1955: 381) has found that among the published sources, "Nearly all Spanish authors say that the Coahuiltecans had no deities." The following excerpts from two reports on the missions of San Antonio, Texas, provide a little additional information on the subjects of marriage and beliefs and give very explicit references to the presence of polygamy, the levirate, and belief in some sort of supreme being in Coahuiltecan culture.

Those who come married from the hills are ratified [in] the [marriage] contract (leaving only one woman to those who bring several) before their baptism; and the Christians are married in due time by the Church and in the conformance with the Holy Council of Trent. (A.G.N., Ramo Historia, Vol. 28, Expediente 7, p. 174r, dated March 6, 1762.)

The most light that these barbarians have in their gentile state is that there is a great thing [which is] author of all things. They observe that the brother inherits the wife of another brother, [whether] she has children or not. They observe nothing in the affinal relationship; and too much in that of consanguinity for permitted sexual unions, [but] of illicit [unions] no account is made. In all other things they are like blank tablets, and, once pacified, one can imprint upon them any aptitude, since for all [things] they have skill. (A.G.N., Ramo Historia, Vol. 28, Expediente 12, p. 202r, year 1740.)

A few additional inferences may be drawn from the confessional written in Coahuilteco by Bartholomé García (1760: 15–16, 78, 81). He gives questions for asking whether a person has had sexual relations with near or distant relatives. Apparently the number of illicit (in Spanish eyes, at least) sexual relations a person might have could become so great as to be wearisome to inquire after, so he also provided a blanket question for all cases. It is especially interesting to note that the Coahuilteco terms given for "concubinage" (as it is expressed in Spanish) have the same linguistic form as the kin-terms for step-relatives. The Coahuilteco terms may be translated therefore as "step-husband" and "step-wife," thus perhaps revealing something of the native attitude toward such relationships (although the possibility should not be ignored that these were compounds invented by García to explain the Spanish concept to the Indians).

Also, in the marriage ceremony, García inserts questions as to whether either one of the couple have had sexual relations with relatives of the other, giving as examples the man with the older sister of his bride or the woman with the younger brother of the groom. These various questions suggest that restraints upon sexual relations even within the kin group were not very strong, but the limits are not clearly defined, for De León and the San Antonio records disagree on the respect accorded consanguinal kinship. However, it must be remembered that these accounts differ in time and in the area and groups concerned.

The use of "sign language" among the Coahuiltecans in the San Antonio missions is attested by one source.

Although there are many languages in these five missions, the most common are four. . . . The language of using only signs is universal in all of the nations, [being used for] making long discourses of whatever intent, as if it were any other language that is pronounced. We availed ourselves of this at the beginning because of not having other means and totally lacking interpreters for many [languages]. (A.G.N., Ramo Historia, Vol. 28, Expediente 12, p. 204f, year 1740.)

Ruecking (1954b) has pointed out that local bands of Coahuiltecans were organized into larger groupings which he has called "band-clusters," one of which he has called the Carrizo cluster (1954b: 8–9). He infers that the Cadima band was dominant in this cluster, and locates the cluster between the Nueces River in Texas and the Río San Fernando in Tamaulipas. He lists 51 bands in the cluster. New light is shed on this group by a document written in Linares, Nuevo León, and dated March 29, 1732, in which Fray Juan Lozada relates his efforts to secure peace with the Indian groups of that area.

The peace agreements being now concluded, I sent three Indians of the mission of San Christoval with word to the nations that live on the bar, near the sea (which seems to be the Sound), [of] which [nations there] are several, giving them special charge that they, the questioners, visit in passing an Indian [who is] general of twenty-six nations named Pedro Botello, [that] they insinuate to him on my behalf the matter referred to (with the Zimas), and that they bring me a report of everything. . . . [Botello replied to them:] "Do not forget that I already have sent *memorias* to Father Lozada with the Canaynas Indians, and they have not informed me. See, I am Captain-General of all these nations—Cadimas, Pelones, Nazas, Pamoranos, Quedejeños, Palmitos, Pintos, Quiniguanos, Maquiapemes, and others—and I govern all [these] and they are at my orders!" (A.G.N., Ramo Historia, Vol. 30, Expediente 15, pp. 199r, 200r.)

These new data permit some revisions in Ruecking's discussion of the Carrizo cluster, while at the same time confirming his inference that the Cadima band was the dominant group. From the foregoing it is evident that in 1732 this band-cluster contained only 26 bands and was situated toward the Gulf coast east of Linares, near the Río San Fernando. It is uncertain to what time-period Ruecking's data relate, but at least for the situation described in 1732 his list must be shortened considerably and the territorial extent of the cluster reduced. However, the Pelones, Palmitos, Quiniguanos, and Maquiapemes must be added to his list. Of these, he does not assign the Palmitos to any band-cluster and the rest are not given in his general list of bands. Unfortunately, it is not possible to determine which bands from the list of 51 were members of the cluster and which were not. Since the Cadima band is given prominence in this cluster, it would seem preferable to re-name it the Cadima cluster, especially since the term Carrizo seems to have been used for groups living along the Rio Grande (Saldívar 1943: map). The amount of power claimed by Botello over the bands of this cluster is somewhat surprising and unexpected, but if true, provides a significant expression of an important feature of Coahuiltecan political organization.

Documents from the archives of Monterrey, Nuevo León, provide some of the earliest information about native groups in that area. These data are scattered sparsely through legal documents dealing with land grants and other matters. One claim to an *encomienda* of Indians contains information of considerable interest (A.A.C.M., Legajo 5, Expediente 11, year 1662). Sebastian García claimed that some of the Alazapa Indians living on the hacienda of Pedro de la Garza belonged to him. He secured testimony from various old people that these Alazapas had originally lived in two *rancherías*, one of which was named Catomao' (meaning "large prickly pears") and the other, Estequenepo' (or Estequenego'). The Catomao' band was said to have been named for its headman of that name. Each ranchería had its separate leader, but both spoke the Alazapa language.

Originally the two groups had lived near one another, on the two crests of a sierra by a large river. They were said to have come together "at the time of the *tuna*"—when the prickly pear ripened—and for dances (ceremonial *mitotes*) and wars "which some Indians are accustomed to have with others." At these times many other rancherías united with them in one place. When tunas were not available they went up in the Sierra to drink *agua miel*, a beverage obtained from the agave plant. A census of the Catamao' rancheria is given, containing demographic data which is unique for this area and very valuable in giving a picture of the actual make-up of a Coahuiltecan band with regard to size, composition of households, etc.

Olazaran (son of former head man)	1
His brother, wife, and two children	4
Vicente, his wife, and one child	3
Pixone and his wife	2
Picota (old man), with his wife	2
An old man	1
Another old man	1
Gabrielillo	1
Bernabelillo, with his wife and child	3

Antoñuelo	1
Tuchi'	1
Another Pixone with his wife	2
Dieguillo and his wife	2
Others at the house of Pedro de la Garza (from memory):	
Juan Perez with his wife and a son and a daughter	4
Mateguelo, with two wives	3
Gasparino (nephew of Bernabelillo)	1
A boy, Bocalito	1
Sister of Juan Perez Bozas	1
Total	34

It is, of course, impossible to estimate what effect years of Spanish contact had already had on the aboriginal situation. However, it would be quite significant for the analysis of Coahuiltecan culture, demography, and ecology if other such records could be discovered and published.

A few band-names of the Borrado Indians are given with Spanish translations (A.A.C.M., Legajo 5, Expedientes 8 and 9). These groups lived in the Sierra de Tamaulipas and in the basin on the west.

Xinipiguara—small thickets.
Opaguiguara—marsh. They lived in a marsh with many reeds between the Pablillo and Potosi rivers.
Caguiraniguara—little painted birds. They lived along a stream which ran and made pools and had many reeds.
Curya.capo, Cruyacapa, Cuiya.capa—large mountain near running water.
Cuya.capo—water inside the mountain.
Passa, Guiguara—painted like *chapules* (dragon-fly).
Passa Guaniguara—painted like *chapules* (dragon-fly). This probably refers to a distinguishing tattoo mark used by the band (cf. Ruecking 1955: 358–361).

Other Borrado bands mentioned without translation were the Guaripa and the Mohiguara. The latter were said to have joined with the Xinipiguara in dances and to have spoken the same language. It is also evident from the records that intermarriage occurred between these two bands. One case involved the daughter of such an interband marriage. The father was a Mohiguara and went to live with his wife who was a Xinipiguara. Subsequently their daughter was kidnapped during a *mitote* and taken to the Mohiguara rancheria, where she was put to work in the kitchen of the hacienda owner. The judgment ordered her returned to the hacienda where the Xinipiguara lived, on the grounds that "the children follow the nature of the mother" (A.A.C.M., Legajo 5, Expediente 9, p. 23f, year 1661).

Both the decision of the case and the residence of the man in his wife's rancheria strongly suggest a matrilineal-matrilocal organization in contrast to the patrilineal-patrilocal character of all Coahuiltecan groups for which information is available (Ruecking 1955: 367–373). However, the location of the Borrados near the border of the Huasteca suggests that their unexpected possession of these social patterns could be due to diffusion from the Mesoamerican area.

The use of peyote as a narcotic by the Coahuiltecans is known from several sources (see Ruecking 1954a: 336–337). Morfi (1950: 311) in 1777 visited the Misión del Dulce Nombre de Jesus de Peyotes near Villa Unión, Coahuila. He explains the unusual appellation of the mission as follows:

> It is called "of the Peyotes" for a plant named thus, in which the land abounds, as useful for various medicinal uses as pernicious for the Indians, who are accustomed to derive from it a sort of drink or beverage of much vigor and strength, [and] by its use in dances and merriments deprive themselves of reason and judgment.

He aso notes (*ibid.*) that the dominant Indian group in the mission was the Sijame band, whose name meant "fish," and that their name was extended to all of the other bands there.

García (1760: 15) mentions the use of peyote in his confessional, along with several other questions of interest:

> Have you eaten human flesh?
> Have you eaten peyote?
> Did it intoxicate you?
> Have you eaten *frijolillo?*
> Did it intoxicate you?
> Have you danced the *mitote?*

This reference to *frijolillo*, or mescal bean, is one of the earliest references known to the use of the seed of the Texas Mountain Laurel (*Sophora secundiflora*) as a narcotic. The juxtaposition of the two questions about peyote and mescal beans seems to be a strong indication of their contemporaneous usage by the Coahuiltecans (see Campbell 1958: 156–160). It may be inferred also that the consumption of human flesh, peyote, and *frijolillo* were associated with the ceremonial dances of the Coahuiltecans, as is known from other sources (Ruecking 1954a). The native terms for peyote and *frijolillo* were *paje* and *samin*, respectively (García 1706: 15).

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A List of Radiocarbon Dates from Archeological Sites in Texas

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THUS FAR 17 radiocarbon dates have been announced for archeological sites in the Texas area. A total of 11 sites is involved (see Table 1), three of which are Neo-American, three are Archaic, and five are Paleo-American. Most of these sites are represented by one date only; however, four Paleo-American sites are represented by two or more dates. Additional radiocarbon dates from these and other sites have been determined, but these have not yet been announced in print.

The dates in the following list are arranged in reverse chronological order, beginning with the most recent dates and proceeding backward in time to the oldest dates. In each case the essential facts are presented under four headings: (1) sample number and name of laboratory that produced the date; (2) sample provenience—material of sample, stratigraphic position, major associations, and culture dated; (3) dating in years before the present and also in terms of the calendar; and (4) references to published literature. In the last category a distinction is made between (a) published date lists and (b) archeological publications that interpret and evaluate the dates.

As the earlier literature on Texas radiocarbon dates is widely scattered, this list should be especially convenient for workers in the Texas field. At present most radiocarbon dating laboratories present their age determinations annually in a single publication, the *American Journal of Science Radiocarbon Supplement*, and dates are much easier to find.

Two useful radiocarbon bibliographies have appeared recently, one by Johnson (1959), the other by McNutt and Wheeler (1959). Johnson's bibliography is broader in scope and therefore more useful.

TABLE 1

Summary List of Texas Radiocarbon Dates

Sites	*Dates* *Years Ago*	*Calendar*
Neo-American Stage		
Elm Fork (Henrietta Focus)	375 ± 145	A.D. 1584 ± 145
Kincaid Shelter (mixed Central Texas and Edwards Plateau)	1212 ± 300	A.D. 740 ± 300
Davis (Alto Focus)	1553 ± 175	A.D. 398 ± 175
Archaic Stage		
Eagle Cave (Pecos River Focus)	4550 ± 130	2593 ± 130 B.C.
Site 78B9–4 (Falcon Focus)	4650 ± 300	2696 ± 300 B.C.
Wood Pit (Carrollton Focus)	5945 ± 200	3986 ± 200 B.C.
Paleo-American Stage		
Scharbauer		
Gray Sand	7100 ± 1000	5144 ± 1000 B.C.
	20,400 ± 900	18,441 ± 900 B.C.
White Sand	8670 ± 600	6715 ± 600 B.C.
	13,400 ± 1200	11,443 ± 1200 B.C.
Plainview	7100 ± 160	5143 ± 160 B.C.
	9800 ± 500	7843 ± 500 B.C.
Lubbock	9700 ± 450	7743 ± 450 B.C.
	9883 ± 350	7932 ± 350 B.C.
Levy Rock Shelter	10,000 ± 175	8041 ± 175 B.C.
Lewisville	more than 37,000	earlier than 35,043 B.C.
	more than 37,000	earlier than 35,043 B.C.

Site on Elm Fork of Trinity River, Dallas County

Unnumbered Sample (Humble)

Sample Provenience: Material not specified, but the culture is identified as Henrietta Focus.

Dating: 375 ± 145 years ago, or A. D. 1584 ± 145.

References:

Published date list: none.

Announced by: Harris, 1959.

Kincaid Shelter, Uvalde County

Sample C-698 (Chicago)

Sample Provenience: Charcoal from Zone 6 (uppermost zone inside shelter), which yielded a mixture of artifacts from the Edwards Plateau Aspect (Archaic Stage) and the Central Texas Aspect (Neo-American Stage).

Dating: 1212 ± 300 years ago, or A. D. 740 ± 300.

References:

Published date lists: Libby, 1952a, 1955.

Archeological evaluation: Suhm, 1960.

Davis Site, Cherokee County

C-153 (Chicago)

Sample Provenience: Charred corn cobs from floor pit of Feature 31, a large circular house outline in the village below the Davis mound. Culture identified as Phase 1 of the Alto Focus, Gibson Aspect (Neo-American Stage).

Dating: 1553 ± 175 years ago, or A. D. 398 ± 175.

References:

Published date lists: Griffin, 1952; Johnson, 1951; Libby, 1951, 1955.

Archeological evaluations: Griffin, 1952; Krieger, 1951a, 1952; Suhm *et al.*, 1954; Willey and Phillips, 1958.

Eagle Cave, Val Verde County

O-317 (Humble)

Sample Provenience: Charcoal from Zone B. Culture represented is identified as the Pecos River Focus (Archaic Stage).

Dating: 4550 ± 130 years ago, or 2593 ± 130 B. C.

References:

Published date list: none.

Archeological evaluations: Epstein, 1960; Schuetz, 1957.

Site 78B9–4, Starr County

M-129 (Michigan)

Sample Provenience: Charcoal (a composite of numerous tiny fragments) from Zone I, lowest occupation zone, at a depth of 8 to 9 feet in the Rosita Terrace, the second of three post-glacial terraces on the lower Rio Grande. The surface of Rosita Terrace is 44 feet above the present normal water level of the Rio Grande. Culture represented is the Falcon Focus (Archaic Stage).

Dating: 4650 ± 300 years ago, or 2696 ± 300 B. C.

References:

Published date list: Crane and Griffin, 1958.

Archeological evaluations: Anonymous (Alex D. Krieger), 1954; Campbell, 1960; MacNeish, 1958; Mangelsdorf *et al.*, 1956.

Wood Pit Site, Dallas County

Unnumbered sample (Magnolia)

Sample Provenience: Mussel shells from near the base of a deposit equated with the Pattillo formation in the Union Terminal-Carrollton Terrace (T-1) of the Trinity River. Culture represented is the Carrollton Focus (Archaic Stage).

Dating: 5945 ± 200 years ago, or 3986 ± 200 B. C.

References:

Published date list: none.

Announced and interpreted by: Crook and Harris, 1959.

Scharbauer Site, Midland County

M-411 (Michigan)

Sample Provenience: Animal bones from Gray Sand stratum.

Dating: 7100 ± 1000 years ago, or 5144 ± 1000 B. C. This sample originally yielded an age of between 4000 and 5000 years on the standard 48-hour count; a two-weeks count gave the age cited above.

References:

Published date list: Crane, 1956.

Archeological evaluations: Hester, 1960; Wendorf *et al.*, 1955; Wendorf and Krieger, 1959; Wormington, 1957.

L-347 (Lamont)

Sample Provenience: Carbon extracted from caliche thought to have been used as hearthstones (carbon believed to have been produced by charring of fats and oils from cooked foods). Derived from Gray Sand stratum that contained the remains of Midland man, as well as one Midland point and two side-scrapers. The caliche was found from 18 to 24 inches below present surface of Gray Sand.

Dating: 20,400 ± 900 years ago, or 18,441 ± 900 B. C.

References:

Published date list: Olson and Broecker, 1959.

Archeological evaluations: Hester, 1960; Krieger, 1957b; Wendorf and Krieger, 1959; Wormington, 1957.

M-388 (Michigan)

Sample Provenience: Fossil bones from White Sand stratum. This sample is a combination of Samples M-389, M-390, and M-391, which were too small to give individual dates.

Dating: 8670 ± 600 years ago, or 6715 ± 600 B. C.

References:

Published date list: Crane, 1956.

Archeological evaluations: Hester, 1960; Krieger, 1957a; Wendorf *et al.*, 1955; Wendorf and Krieger, 1959; Wormington, 1957.

L-304C (Lamont)

Sample Provenience: Fresh-water snail shells from White Sand stratum.

Dating: 13,400 ± 1200 years ago, or 11,443 ± 1200 B. C. (Krieger, 1957a, reported this date as 12,500 ± 1200 years, but laboratory recalculation produced an older date).

References:

Published date list: Broecker and Kulp, 1957.

Archeological evaluations: Hester, 1960; Krieger, 1957a, 1957b; Sellards and Evans, 1960; Wendorf and Krieger, 1959; Wormington, 1957.

Plainview Site, Hale County

O-171 (Humble)

Sample Provenience: Fossil bison bone from bone bed that yielded bison bones and Plainview points.

Dating: 7100 ± 160 years ago, or 5143 ± 160 B. C.

References:

Published date list: Brannon *et al.*, 1957.

Archeological evaluations: Hester, 1960; Krieger, 1957a; Wendorf and Krieger, 1959; Wormington, 1957.

L-303 (Lamont)

Sample Provenience: Fresh-water snail shells from bone bed that yielded bison bones and Plainview points.

Dating: 9800 ± 500 years ago, or 7843 ± 500 B. C. (Krieger, 1957a, reported this date as 9171 ± 500 years, but later laboratory recalculations gave an older date).

References:

Published date list: Broecker and Kulp, 1957.

Archeological evaluations: Hester, 1960; Krieger, 1957a; Sellards and Evans, 1960; Wendorf and Krieger, 1959; Wormington, 1957.

Lubbock Site, Lubbock County

L-283G (Lamont)

Sample Provenience: Fresh-water snail shells from diatomaceous stratum that yielded fossil bison and Folsom points. Slightly higher in the deposit than Sample C-558, given below.

Dating: 9700 ± 450 years ago, or 7743 ± 450 B. C. (Krieger, 1956, reported this date as 9300 ± 200 years, but laboratory recalculations gave a greater age).

References:

Published date list: Broecker and Kulp, 1957.

Archeological evaluations: Hester, 1960; Krieger, 1956; Sellards and Evans, 1960; Wendorf and Krieger, 1959; Wormington. 1957.

C-558 (Chicago)

Sample Provenience: Burned bone from diatomaceous stratum that yielded fossil bison and Folsom points.

Dating: 9883 ± 350 years ago, or 7933 ± 350 B. C.

References:

Published date lists: Griffin, 1952; Johnson, 1951; Libby, 1951, 1952b, 1955.

Archeological evaluations: Hester, 1960; Krieger, 1951b, 1953, 1956; Roberts, 1951, 1952, 1953; Sellards, 1952a, 1952b; Sellards and Evans, 1960; Suhm *et al.*, 1954; Wendorf *et al.*, 1955; Wendorf and Krieger, 1959; Willey and Phillips, 1955, 1958; Wormington, 1953, 1957.

Levy Rock Shelter, Travis County

Unnumbered sample (Humble)

Sample Provenience: Material not designated. Found immediately below a zone containing numerous Angostura points and burins. The dated stratum yielded three projectile point fragments (apparently not in the Angostura tradition) as well as burins. The culture dated is not identified.

Dating: 10,000 ± 175 years ago, or 8,041 ± 175 B. C.

References:

Published date list: none

Archeological interpretation: Epstein, 1960.

Lewisville Site, Denton County

O-235 (Humble)

Sample Provenience: Carbonized fibrous vegetable material from Hearth 1, buried at a depth of approximately 20 feet in the Union Terminal-Carrollton Terrace. The surface of this terrace is 70 feet above the normal level of the present Trinity River. The sample is from the same level as and only 20 inches away from a Clovis point. The terrace formation containing the sample and the projectile point is identified as Upper Shuler.

Dating: More than 37,000 years ago, or earlier than 35,043 B. C.

References:

Published date list: Brannon *et al.*, 1957.

Archeological evaluations: Crook and Harris, 1957, 1958; Hester, 1960; Krieger, 1957a; Sellards, 1960; Willey and Phillips, 1958; Wormington, 1957.

O-248 (Humble)

Sample Provenience: Charcoal from several small logs in Hearth 8, approximately 300 feet northeast of Hearth 1 and at essentially the same stratigraphic level as Hearth 1 (see Sample O-235 above).

Dating: More than 37,000 years ago, or earlier than 35,043 B. C.

References:

Published date list: Brannon *et al.*, 1957.

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Book Reviews

The Belcher Mound: A Stratified Caddoan Site in Caddo Parish, Louisiana, by Clarence H. Webb. Memoir No. 16, Society for American Archaeology, Beloit College, Beloit, Wisconsin, 1959. 212 pp., 142 figs., 4 tables. $3.00

Dr. Webb has written a technical monograph of major importance to everyone interested in the archeology of the Caddoan area—the area made up of the adjacent parts of Texas, Louisiana, Arkansas, and Oklahoma. The Belcher Mound (now destroyed) was near Shreveport, Louisiana, and was dug in the late 1930's and early 1950's by Dr. Webb and associates, all skilled non-professionals. Within it were the remains of four successive stages of occupation representing a gradual change from late Gibson Aspect (early Caddoan) to Fulton Aspect (late Caddoan). The mound, together with an occupation area nearby, seems to have been a minor ceremonial center serving small settlements scattered along this part of the valley of the Red River.

The mound was made up of a series of houses, mainly ceremonial in nature, which had been burned in connection with important burial ceremonies. Graves were dug, usually through the burned remains of the houses, and in the graves were buried important individuals along with a number of other people who were probably put to death as part of the funeral ceremonies for the major personage. Subsequently an earth layer was added and later houses built, to be destroyed in turn as part of later funeral observances.

The earliest houses were on the original ground level and the associated burials were of the Haley Focus, late Gibson Aspect. Some Fulton Aspect traits (such as Pease Brushed-Incised pottery) were already appearing. The second level was a Bossier-like occupation, in reality a Haley-Belcher transition on the same time level as Bossier Focus and in contact with Bossier. The third and fourth levels represented the full flowering of the Belcher Focus, the major ceremonial centers of which were farther up the Red River at the Foster and Battle sites.

The monograph is a model of archeological reporting. The description of methods used in digging is detailed and clear, and should be of great use to anyone contemplating work in similar sites. All finds are adequately described and are compared with other finds from the Caddoan area and, where pertinent, with similar finds throughout the continent. For instance, after the descriptions of the houses there is a section which discusses the resemblances and possible relationships of Caddoan houses to prehistoric house types throughout North America. A similar treatment is given burial types. The report is especially striking in that many of the artifacts are illustrated twice—once by a drawing (the author is skilled with pen and ink) accompanying the description of the house or burial with which the specimen was associated, and once by a photograph.

The final summarizing section pulls all the material together, reviewing the story of the site and presenting a cogent reconstruction of its place in Caddoan prehistory. Dr. Webb sees the Fulton Aspect foci—Belcher, Bossier, Texarkana, Titus, and probably others—deriving from inter-action between peoples of the Haley, Alto, and Coles Creek cultures. Only in Belcher Focus did many of the more striking ceremonial traits of the Gibson Aspect survive. Belcher Focus seems to derive primarily from Haley Focus, with a strong admixture of Southern Cult ceremonialism coming from an unknown source.

With the publication of this report we now have detailed studies of two major Caddoan sites, one from the Gibson Aspect (Newell and Krieger, *The George C. Davis Site, Cherokee County, Texas*) and the present one primarily from the Fulton Aspect with information on the change from Gibson Aspect to Fulton Aspect. The Caddoan area, one of the significant archeological areas of North America, is at long last coming into its own.

Dr. Webb has asked reviewers to mention that he inadvertently neglected giving credit to a number of individuals who helped prepare the illustrations in the report. Many of the pottery photographs are by Alex D. Krieger; other artifact photographs are by Steve Sanchez and Gordon W. Maxcy. The aerial photographs are by the Caddo Parish Agriculture Department and Wm. Grabill. All the drawings and field photographs, and some of the artifact photographs, are by the author.

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The Aztecs: People of the Sun, by Alfonso Caso. Illustrated by Miguel Covarrubias. Translated by Lowell Dunham. University of Oklahoma Press, Norman, 1958. xvii + 125 pp., 42 color drawings, 16 plates, index. $7.95.

This volume is a translation from the Spanish of Alfonso Caso's book, *El Pueblo del Sol*, published in Mexico in 1953 by the Fondo de Cultura Económica. It represents a very important and extremely welcome addition to the scanty literature in English dealing authoritatively with the pre-Hispanic people of Mexico and is by a writer who is internationally recognized as a leader in the fields of Mexican archeology and historical research. In this book he presents a concise and accurate accout of the religious concepts and practices of the Aztecs, based on modern research. The most important of the many Aztec deities are described and briefly discussed. From codices and other Mexican sources the late Miguel Covarrubias has derived full-color drawings of most of these gods which aid in understanding their physical appearance and symbolism.

The religion of the Aztecs formed the core of their life-way and permeated all their activities. Their spiritual concepts were complex, well developed, and logical. They were based on the Aztecs' consideration of themselves as a "chosen people" with the special religious duty of supplying the gods with their essential nourishment, human sacrifices. In the Aztec view, men and the gods were mutually dependent; the gods created and sustained men, and men's sacrifices kept the gods strong. Even war became a form of worship because the principal purpose was to capture prisoners to sacrifice to the gods.

There are a few errors of translation, mostly minor, but two more serious one should be mentioned. On page 56, the name of the goddess Cihuacóatl should be deleted from the paragraph referring to the goddess Tlazoltéotl. On page 20, the star observed by the Aztecs was either Aldebaran or the constellation of the Pleiades, but the constellation of Aries, the "Ram," was not involved.

The book is a credit to the University of Oklahoma Press in the beauty of its composition, printing, and binding. The 42 handsome six-color drawings by Covarrubias are flawlessly reproduced, and the 16 black-and-white photographic plates are full of detail. Use of the book has been greatly facilitated by Dr. Dunham's compilation of a detailed index, which was lacking in the Spanish edition. This volume can be recommended without reservation.

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Poverty Point, A Late Archaic Site in Louisiana, by James A. Ford and Clarence H. Webb. Anthropological Papers of the American Museum of Natural History, Vol. 46, Part 1. 136 pp., 6 plates, 45 figs., 9 tables. New York, 1956. $2.00.

The Poverty Point site in northeastern Louisiana, with its huge, oddly shaped mound, has long been known as one of the most mysterious and intriguing, and probably one of the most important, prehistoric sites on the North American continent. The thousands of artifacts which have been collected from the surface of the site over the years—clay balls, plummets, gorgets, roughly smoothed adzes, beads, and others, are of types which are ordinarily ascribed to the Archaic period of the Southeast, before the Indians had pottery or agriculture. But mound-building is known as a trait of the pottery-making Indians of the Southeast, not of the earlier Archaic Indians, and for this reason the Poverty Point site has never made sense as far as surface evidences have been concerned. The site has, in fact, been so baffling that until recent years most archeological effort in the area has been directed at other sites where the problems were simpler.

Within the last 20 years Dr. Clarence H. Webb has published several notes arising from his studies of materials collected at Poverty Point. Then Dr. James A. Ford excavated the Jaketown site in Mississippi and found it to have a zone with Poverty Point artifacts, stratigraphically below the earliest pottery complex of the Lower Mississippi valley This proof of the early date of Poverty Point only served to heighten the mystery surrounding the Poverty Point site itself, a mystery which was further intensified when Dr. Ford found, upon examining an aerial photograph of the site, that next to the great Poverty Point mound there was a huge octagonal earthwork nearly three-quarters of a mile in diameter, made of six rows of ridges too low to be noticed from the ground but easily seen from the air. The earth-works, the Poverty Point mound, and two other mounds on the site contain nearly a million cubic yards of earth—surely one of the more extensive construction jobs in American Indian history.

The work under review here is a report by Dr. Ford of the first intensive archeological exploration at Poverty Point, mainly in 1956, and an exhaustive analysis of artifacts from the site—most of them from the surface—by Dr. Webb. Their work has by no means cleared up the mystery of Poverty Point, but it has dispelled much of the fog surrounding it.

Dr. Ford's field work indicated that the ridges of the earthworks were lived upon. However, no evidences of structures were found. Several thousand people, living in more than 600 dwellings, are estimated to have occupied the site. The Poverty Point mound, 70 feet high, is shown to be entirely of artificial construction, and is interpreted as a bird effigy, now much eroded. One of the other mounds, the Motley mound, appears to be an unfinished structure of the same type as the Poverty Point mound. The third mound, which is conical, was built in four stages and seems to have been erected upon a cremation burial.

By comparing Poverty Point projectile point types with those from stratified sites in the Tennessee Valley and surface collections in Louisiana, Dr. Webb shows that Poverty Point dates from the very end of Archaic times. There are even a very few fiber-tempered potsherds in the collection, probaby traded in, signaling the closing years of the Archaic. The well-known clay balls ("Poverty Point objects") which occur by the thousands on the site, are shown to be artificial cooking stones, serving the same purpose as the fire-cracked stones found in abundance at many Archaic sites such as the Texas burned-rock middens. The plummets which have been collected in large numbers are interpreted as bolas weights. (Similar objects in California are known to be charm stones there, and this reviewer feels that the bolas weight idea must be considered very tentative.)

The artifacts are made of materials from many different places—Mississippi, Arkansas, the southern Appalachians, and even north of the Ohio River. The trading patterns manifested are truly impressive.

The site seems to have been occupied only for a few decades at most. Combining cultural, geological, and radio-carbon dating evidence, the authors place the occupation at about 800–600 B.C.

We still do not know how an Archaic people, living by hunting and fishing, had the time or organization to do such a tremendous construction job; but Dr. Ford suggests that the Archaic occupants of the site were ruled by a caste of northern invaders who bore the traditions that were eventually to cultimate in the spectacular Hopewell culture of the Middle West. Under the direction of the conquering invaders, according to this hypothesis, the earthworks were built. But, guesses Dr. Ford, the conquest did not last for long and the northern traditions soon died out. The Archaic peoples then returned to their simpler way of life. Dr. Ford further believes that the Poverty Point people *did* have agriculture, since no other method of food-getting would permit the time or population concentration necessary to construct such a site. Unfortunately there is no direct evidence backing up these hypotheses, credible though they be. The mystery remains.

This report and Ford's earlier one on the Jaketown site have partially revealed a most intriguing chapter in American prehistory, and one which, even with this excellent work, is still far from being understood. Writers of archeological reports can use this monograph as one of their models, because the difficult job of clearly describing the excavation is very well handled and the artifact analysis is excellent.

There have been proposals, as yet not successful, to have the Poverty Point site made a state park, or even a national monument. Louisiana could do much worse than put this remarkable monument of a far-off time under public protection. The work of Ford and Webb and associates has shown that the site represents a time when the North American Indians were abreast of those in Central and South America at least in political organization and architectural achievements. If left in its present state the site will gradually disappear. As a park, combining the benefits of a recreational facility with the educational aim of giving man a broader view of himself, it would be a credit to the state or to whatever other agency might undertake to preserve it. Ford and Webb have done the main job of giving the site its proper place in the American archeological scene.

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Tribes That Slumber: Indian Times in the Tennessee Region, by Thomas M. N. Lewis and Madeline Kneberg. 196 pp., many illustrations (unnumbered). University of Tennessee Press, Knoxville, 1958. $3.75.

This is a really fine book on the prehistory and the historic Indians of the Tennessee region, by the two people who know it best. The Preface begins, "This book has been written for students, for amateur archaeologists, and for all other persons with curiosity about the Indians." It is actually very simply written, presupposing no previous knowledge on the part of the reader, and is bound to be read with interest by everyone from junior high-school age up.

There are ten chapters, of which the first five are on the archeology, period by period, beginning with Nomadic Hunters of the Ice Age and ending with The Age of Temple Mounds. Throughout, the authors emphasize the continuity of their story, and the reader is constantly made aware that the whole account leads up to the historic Indians, the Creeks, the Yuchi, and the Cherokee, who are described in the final five chapters. The archeological chapters are abundantly illustrated with drawings and photographs of artifacts, and with Kneberg's illustrations of prehistoric scenes. The text is down-to-earth and free of romantic theorizing. There are good summary accounts of the traits which are found in the various complexes, with many artifact illustrations, and these trait lists are woven into the general account of life in the past, so that the whole story makes good reading for everyone. It is possible even for the beginner to get some idea of how the archeologist extracts an image of the past from his information. The total result is a dynamic story of the development of an increasingly complex life, from the simple nomadic ice-age hunters up through the ages to the sophisticated Temple Mound people who emerge in historic times.

The final five chapters are quick surveys of the history and ways of life of the Creeks, the Yuchi, and the Cherokee. This reviewer feels that the discussions are a bit stiff, something of a parade of "interesting customs of interesting natives" which fail to convey the sense of real people really living; but it is doubtful that everyone will react this way.

The book is fascinating and should be popular for many years. It is most highly recommended for anyone interested in the native history of the southeastern United States.

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Wm Hoe