

BULLETIN OF THE TEXAS ARCHEOLOGICAL SOCIETY

Vol. 31, for 1960 / Published by the Society / Austin, Texas, 1961

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 1960

President: WILSON W. CROOK, JR. (Dallas)

President Emeritus: CYRUS N. RAY (Abilene)

Active Vice-President: E. MOTT DAVIS (Austin)

Secretary-Treasurer: MARDITH K. SCHUETZ (San Antonio)

Editor of Publications: T. N. CAMPBELL (Austin)

Directors (in addition to the above): MICHAEL E. COLLINS (Midland), EDWARD B. JELKS (Austin), HENRY F. STURGIS (Austin).

Trustees: C. E. BISSELL (Midland), CARL B. COMPTON (Denton), R. KING HARRIS (Dallas), RICHARD E. JOHNSON (Fort Worth), O. L. SIMS (Paint Rock), CLARENCE H. WEBB (Shreveport, La.), SAM WHITESIDE (Tyler), R. B. WORTHINGTON (Houston).

Regional Vice-Presidents: ROBERT E. BELL (Norman, Okla.), W. A. DAVIS (Jasper), JACK T. HUGHES (Canyon), THOMAS C. KELLY (San Antonio), ISABELLE R. LOBDELL (Fort Worth), WAYNE B. NEYLAND (Houston), CHARLIE R. STEEN (Santa Fe, N. Mex.), BURKE WARRICK (Pine Bluff, Ark.).

Fellows: ALEX D. KRIEGER (Riverside, Calif.), CYRUS N. RAY (Abilene), E. H. SELLARDS (Austin), CLARENCE H. WEBB (Shreveport, La.).

Membership and Publications

Active and Institutional Memberships in the Society are \$5.00 per year. The Society also offers Contributing Annual Memberships at \$25.00 and Life Memberships at \$100.00. All members of the Society receive the *Bulletin*, which is published annually, and *Texas Archeology*, a newsletter that is sent out about four times a year. Back issues of the *Bulletin* that are still in print may be obtained at \$5.00 per volume.

Address orders for publications and membership applications to Secretary-Treasurer, Texas Archeological Society, Witte Memorial Museum, Brackenridge Park, San Antonio 9, Texas. The mailing address of the Editor of Publications is Box 8012, University Station, Austin 12, Texas.

Information for Contributors

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

Manuscripts should be typed on 8½ by 11 inch sheets of white bond paper, and *all material* should be double-spaced. Footnotes should be avoided or kept to a minimum.

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

The proportions of full-page illustrations should be suitable for reduction to *Bulletin* page size (6 by 9 inches), allowing space for captions at the bottom. Captions for illustrations should be listed in numerical order and placed behind the list of references cited.

Each paper must be accompanied by an abstract (one or two paragraphs summarizing the main points of the paper). This abstract will precede the paper in the *Bulletin* and will be reprinted in *Abstracts of New World Archaeology*, an annual publication of the Society for American Archaeology.

Contributors will receive galley proof. Reprints with or without covers will be supplied at the following prices, and orders must be placed when galley proof is returned to the editors.

Reprint Prices

| Copies | 1-4 pp. | 5-8 pp. | 9-12 pp. | 13-16 pp. | 17-20 pp. |
|--------|---------|---------|----------|-----------|-----------|
| 50 | \$ 4.00 | \$ 8.00 | \$12.00 | \$16.00 | \$20.00 |
| 100 | 4.80 | 9.60 | 14.40 | 19.20 | 24.00 |
| 200 | 6.60 | 13.20 | 19.80 | 26.40 | 33.00 |
| 300 | 8.00 | 16.00 | 24.00 | 32.00 | 40.00 |
| 500 | 10.60 | 21.20 | 31.80 | 42.40 | 53.00 |

Covers with title and date of issue will be furnished at additional cost: 50 copies, \$3.00 extra; 100 copies, \$4.00; 200 copies, \$8.00; 300 copies, \$12.00; 500 copies, \$16.00.

BULLETIN
of the
TEXAS ARCHEOLOGICAL SOCIETY
Volume 31, for 1960

Editor: T. N. Campbell

Assistant Editors:

E. Mott Davis

Edward B. Jelks

Published by the Society at Austin, Texas, 1961

This issue is dedicated to the memory of

E. H. SELLARDS

1875-1961

At the 31st Annual Meeting of the Texas Archeological Society in Austin Texas, on October 30, 1959, Dr. Sellards was made a Fellow of the Society. The following citation was read.

Internationally recognized authority on the Pleistocene archeology and paleontology of the New World, he has made many important contributions to American archeology in addition to his long leadership in Texas geology. One of the earliest proponents of Pleistocene man in the New World, Dr. Sellards reported in 1916 on the discovery of human remains associated with Pleistocene fauna at Vero, Florida, long before such antiquity for man in the New World was generally accepted. His subsequent work, alone and with others, at a multitude of important sites—Miami, Plainview, Berclair Terrace, Blackwater Draw, Lubbock, Malakoff, Friesenhahn, Montell, Kincaid, Milnesand, Midland, and others—has probably contributed more primary data on the Paleo-Indian problem than has the work of any other individual. His book, *Early Man in America*, a general survey of the problem which he is now bringing up to date for a new edition, is one of the standard reference works on the subject.

Table of Contents

SYMPOSIUM: RELATIONSHIPS BETWEEN THE CADDOAN AREA AND NEIGHBORING AREAS

| | |
|---|-----|
| The Caddoan Area: An Introduction to the Symposium By E. Mott Davis | 3 |
| Relationships Between the Caddoan and Central Louisiana Sequences By Clarence H. Webb | 11 |
| Discussion: By Alex D. Krieger | 21 |
| By James A. Ford | 24 |
| Relationships Between the Caddoan Area and the Mississippi Valley By James B. Griffin | 27 |
| Discussion: By Philip Phillips | 37 |
| By Stephen Williams | 40 |
| By Alex D. Krieger | 43 |
| Relationships Between the Caddoan Area and the Plains By Robert E. Bell | 53 |
| Discussion: By David A. Baerreis | 60 |
| By Marvin F. Kivett | 61 |
| By Robert L. Stephenson | 62 |
| Relationships Between the Caddoan Area and Texas By Edward B. Jelks | 65 |
| Discussion: By T. N. Campbell | 70 |
| Proceedings of the Fifth Conference on Caddoan Archeology Edited by E. Mott Davis | 77 |
| Caddoan Radiocarbon Dates Compiled and edited by T. N. Campbell | 145 |

| | |
|--|-----|
| An Archeological Reconnaissance Behind the Diablo Dam, Coahuila By Walter W. Taylor and Francisco Gonzáles Rul | 153 |
| An Analysis of Val Verde County Cave Material: Part II By Mardith K. Schuetz | 167 |
| The Beidleman Ranch Site: An Early Man Kill Site in Stonewall County, Texas By Dee Ann Suhm | 207 |
| An Archeological Survey of Blackburn Crossing Reservoir on the Upper Neches River By LeRoy Johnson, Jr. | 213 |
| The Crumley Site: A Stratified Burnt Rock Midden, Travis County, Texas By Col. Thomas C. Kelly | 239 |
| Archeological Notes on the Route of Cabeza de Vaca By Herbert C. Taylor, Jr. | 273 |
| Ecological Implications of Fresh-Water and Land Gastropods in Texas Archeological Sites By D. C. Allen and E. P. Cheatum | 291 |
| An Evaluation of Radiocarbon Dates From the Galena Site, Southeastern Texas By E. Raymond Ring, Jr. | 317 |
| New Radiocarbon Dates from Texas Two Radiocarbon Dates from the Central Brazos Valley By Frank H. Watt | 327 |
| Two Radiocarbon Dates from the Galena Site of South- eastern Texas By E. Raymond Ring, Jr. | 329 |
| A Radiocarbon Date From Central Texas By Col. Thomas C. Kelly | 329 |
| A Radiocarbon Date From Goebel Midden, Austin County By Charles B. Fleming | 330 |
| E. H. Sellards, Geologist and Prehistorian, 1875-1961 By T. N. Campbell | 331 |

Book Reviews

Jelks and Tunnell, *The Harroun Site: A Fulton Aspect Component of the Caddoan Area, Upshur County, Texas*
By Clarence H. Webb 337

Davis and Davis, *The Jake Martin Site: An Archaic Site in the Ferrell's Bridge Reservoir Area, Northeastern Texas*
By Clarence H. Webb 339

Abstracts of New World Archeology, Volume 1
By Robert E. Bell 341

Murdock, *Ethnographic Bibliography of North America*
By T. N. Campbell 343

Symposium

RELATIONSHIPS BETWEEN THE CADDOAN
AREA AND NEIGHBORING GROUPS

The Caddoan Area: An Introduction to the Symposium

E. MOTT DAVIS

The Symposium

This paper and those which follow are based on presentations made at a symposium on "Relationships Between the Caddoan Area and Neighboring Areas" at the 23rd annual meeting of the Society for American Archaeology at the University of Oklahoma on May 2, 1958. Robert E. Bell, Chairman of the Program Committee for that meeting, suggested a session on Caddoan archeology in which the papers would not be so specialized as to be incomprehensible to the listeners, almost all of whom would not be specialists in Caddoan archeology. The symposium was therefore set up with two factors in mind: the relative ignorance of the audience, and the specialized interests of the speakers. The general topic of "relationships with neighboring areas" was chosen because it provided an opportunity to present not only something about Caddoan archeology, but also about its place in the culture history of the continent—a subject of interest to all Americanists, whether Caddoan specialists or not. In addition, the program was set up to include discussions for each paper, since this practice, especially when disagreements are voiced, makes technical subjects stimulating for specialists and non-specialists alike. For this reason also, the discussants were enjoined not simply to echo the opinions of the main speaker. In addition, the symposium was begun with a brief presentation of the current state of knowledge of Caddoan archeology, in order to provide a frame of reference for those unacquainted with the area.

It is acknowledged with regret that one set of relationships, perhaps the most fascinating of all, is not touched on here: the relationships between the Caddoan area and Mexico. This is a subject which, to be treated other than superficially, would alone require an entire symposium, or even several symposia.

Since the symposium took place, in 1958, the authors of the papers and the discussants have had the opportunity to revise their oral presentations as they have seen fit. In a few cases the papers appear here essentially as they were given at the symposium; those by Bell, Webb, and Jelks are in this category. The rest of the papers have undergone revision; some more, some less. The task of marshalling the written papers has been carried out by T. N. Campbell, the editor of this bulletin.

It should also be noted that the Fifth Conference on Caddoan Archeology was held at the University of Oklahoma just before the meeting of which this symposium was a part, and some of the matters treated formally in the symposium had already been discussed informally, and at length, in the Conference. The Proceedings of the Conference are published in this bulletin, following the present group of symposium papers. There is some duplication, but not a great deal. The combination of symposium and conference provides a good view of the present status of Caddoan archeology.

The Caddoan Area

Geographical Limits. The area in which Caddoan sites are important is made up of the adjoining parts of the states of Oklahoma, Arkansas, Louisiana, and Texas. The northern boundary is the Arkansas River, with its immediate tributaries, and the eastern boundary is the Ouachita and its immediate tributaries. On the south, the edge of the area is about one hundred miles inland from the Gulf of Mexico, and on the west the border can be drawn at the western edge of the "piney woods" in Texas—roughly, the Trinity-Brazos divide—and northward to the vicinity of Tulsa, Oklahoma. Some Caddoan components are found outside these bounds, but in general they define what we usually think of as "The Caddoan Area." It is a wooded, well-watered area without significant natural barriers to movement, and well suited to native agriculture. Archeologically it is part of the Southeastern area of North America.

Archeological Characteristics. Caddoan sites are village sites, ceremonial centers with mounds, and burial grounds containing graves with quantities of distinctive, well-made pottery of a wide variety of types. On the pottery, which is not painted, engraving and excising of polished ware, often with paint rubbed into the engraved lines, is a favorite form of decoration; and bottles and carinated bowls are (along with jars) popular vessel forms. The interlocking scroll is a frequent design motif. The usual tempering material is clay, but twenty to

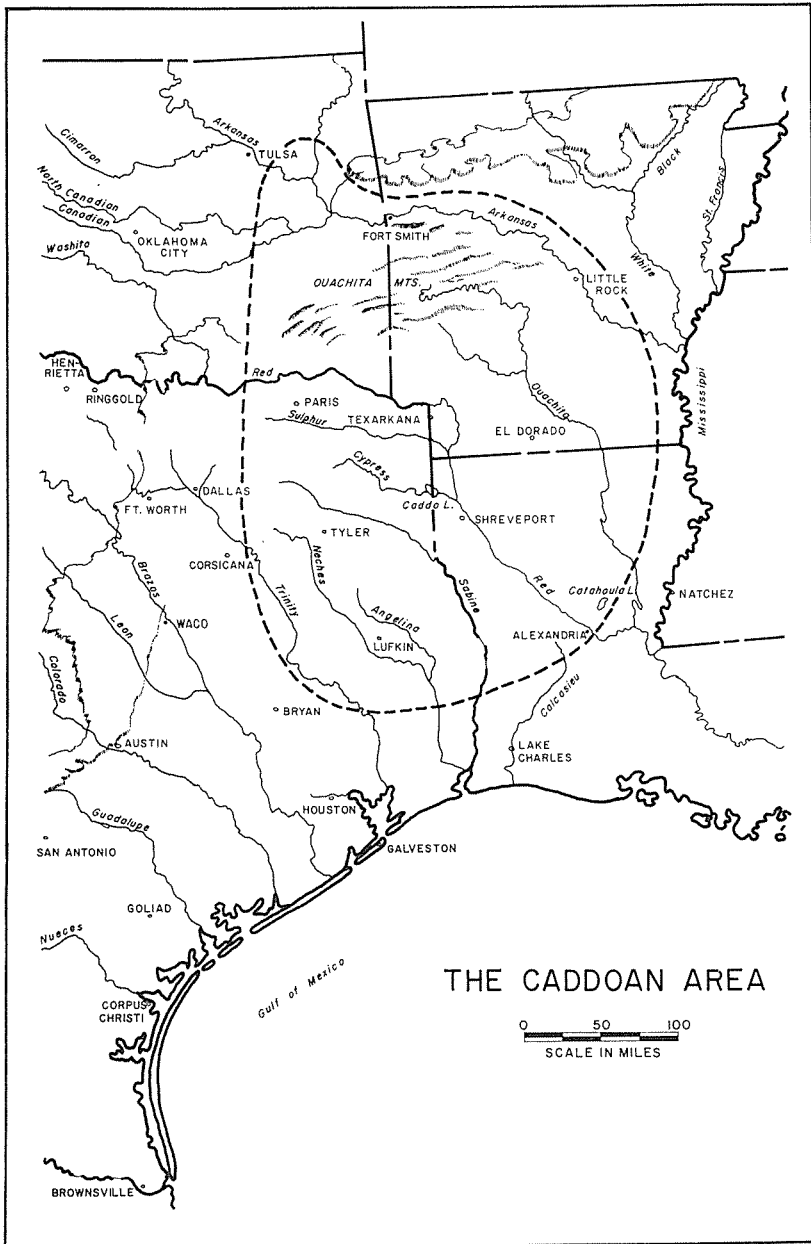


Fig. 1. The Caddoan Area.

thirty per cent of vessels are tempered with crushed bone—a trait which sets Caddoan ceramics off from most others. No shell tempering occurs until relatively late times in most of the Caddoan area. Pottery pipe forms are distinctive. One very distinctive trait is a particular house type in which the archeologist finds a large post mold underneath the central fireplace, signifying the use of a central post as a temporary scaffold in the building of the structure.

Subdivisions: Aspects and Foci. Archeological nomenclature in the Caddoan area follows the Midwestern Taxonomic System. The components fall into two groups: Gibson Aspect or early Caddoan, and Fulton Aspect or late Caddoan. Transitional sites are known, but most components are clearly in one aspect or the other. Within the two aspects a number of foci have been distinguished. They are listed here alphabetically.

Gibson Aspect Foci

Alto (Texas)
 Haley (Arkansas, Louisiana,
 Texas)
 Gahagan (Louisiana)
 Sanders (Texas, Oklahoma)
 Spiro (Oklahoma)

Fulton Aspect Foci

Prehistoric foci:

Belcher (Louisiana, Arkansas)
 Bossier (Louisiana, Arkansas,
 Texas)
 Fort Coffee (Oklahoma)
 Frankston (Texas)
 McCurtain (Oklahoma, Texas)
 Mid-Ouachita (Arkansas)
 Texarkana (Texas, Arkansas)
 Titus (Texas)
 Turkey Bluff (Oklahoma)
 Wylie (Texas—a western focus
 which may not be Caddoan)

Historic foci:

Allen (Texas)
 Glendora (Texas, Louisiana,
 Arkansas)

The components of the Fulton Aspect which contain European trade material—those in the Allen and Glendora foci and others—are currently being re-examined with an eye to reclassification. This part of the list will very likely soon be changed.

Gibson Aspect sites include ceremonial centers with platform mounds containing large deep burial pits with multiple burials and rich cult offerings, including (in some sites) Southern Cult materials. Characteristic ceramic traits are very fine-line engraving, bottles with long tapering spouts, and pipes with very long slender stems and small bowls.

In the later Fulton Aspect, the whole impression is that of a less sophisticated culture, except in a restricted area along the bend of the Red River in southwestern Arkansas, where a number of Gibson Aspect ceremonial traits survive. In general, Fulton Aspect mound building is restricted to relatively small mounds and to mantles on Gibson Aspect mounds. By historic times, mound building is no longer practiced. Typical Fulton Aspect sites are extensive cemeteries of single interments with a great deal of pottery, but usually no Southern Cult objects. Characteristic ceramic traits are red slipped ware, brushed utility pottery, relatively coarse engraved lines, wide-mouth vessels with high flaring rims, spurred-line scrolls, the interlocking scroll motif repeated four times around the vessel, cross-hatched engraving as a background motif, and conical-bowl pipes.

Some Fulton Aspect sites contain European trade material, as already mentioned, and some of these historic remains have been identified with specific Caddo tribes of the 17th and 18th centuries, such as Kadohadacho, Cahinnio, Hasinai, and Natchitoches.

Concentration on Ceremonial Sites. The fact that nothing has been said about village sites, in this description of the two aspects, reflects the fact that most archeological work in the Caddoan area has been directed at mounds and cemeteries. Little information is available on subsistence patterns, settlement patterns, or others of the everyday, basic facets of Caddoan culture history. The fact that Caddoan culture is synonymous with horticultural village life in this area is about all we can say. The reasons for such phenomena as the appearance of Caddoan traits in the area, certain shifts in the geographical range of Caddoan materials with time, and the change from the Gibson Aspect to the Fulton Aspect, are almost entirely unknown. Systematic studies of prehistoric Caddoan socioeconomic patterns can rightfully be said to be in their infancy.

Chronology. Concerning the matter of chronology in the Caddoan area, there are important disagreements. Naturally the European trade material, which first appears sometime between A.D. 1600 and 1750, provides an anchor at the near end of the sequence. In the pre-historic complexes the chronological evidence takes the form of stratigraphic relationships at a relatively few sites, strong cross-ties and sequential ties in artifact types, a few radiocarbon dates, and correlations with the relatively well-established central Louisiana sequence of Marksville-Troyville-Coles Creek-Plaquemine. It is in the critical matter of the correlations with central Louisiana and the rest of the Mississippi Valley that the disagreements occur. In simplified terms there are two schools of thought on this matter:

(1) The first school is made up in the main of persons who have done their work in the Caddoan area; the name of Alex D. Krieger is most commonly associated with this viewpoint. According to this point of view, the whole Caddoan archeological sequence covers a thousand years or more, beginning around A.D. 700, or perhaps as early as A.D. 400 or 300. The Gibson Aspect is seen as beginning at about the same time as, or earlier than, the Coles Creek period in the lower Mississippi Valley.

(2) The second school of thought is made up mostly of persons who have done their work in the Mississippi Valley, and is frequently identified with the name of James A. Ford. In this view, the whole Caddoan sequence is relatively brief, covering perhaps four centuries. It begins around A.D. 1200 or 1300, at the end of the Coles Creek period in the lower Mississippi Valley.

Both points of view have good evidence in their favor, as certain of the papers which follow will make clear. The problem is important, since it has a bearing on Caddoan origins. The cult material, platform mounds, and many other items, which are commonly classed as "Mississippian" and are found in early Caddoan sites as well as farther east, derive their ultimate inspiration from Mesoamerica. If Caddoan beginnings go back to A.D. 400, as adherents of the "Krieger" school think possible, then the Caddoan area could have been the first to have these Mesoamerican traits, which could have spread thence eastward to the Mississippi Valley. By the "Ford" chronology, on the other hand, the Caddoan area would necessarily have been the recipient of these traits from the Mississippi Valley cultures, rather than having donated them to the latter.

Archaic Antecedents. A further aspect of the question of Caddoan

origins lies in the problem of the relationship of early Caddoan cultures to the Archaic cultures which preceded them in the same area. Little is known on this subject, because until very recently our knowledge of the Archaic cultures was based almost entirely on studies of surface collections (a major exception has been Baerreis' work in northeastern Oklahoma). However, despite the rudimentary state of knowledge, some relevant facts are known. Much of the Archaic stone inventory continues with little alteration into the early Caddoan complexes, so that the impression of continuity from Archaic to Caddoan is as strong as that of change. From this circumstance it might be assumed that the appearance of Caddoan traits in the area was due more to cultural diffusion than to population movement. Unfortunately there have been few skeletal studies in the area, so that the question of population changes remains to be answered.

There are a number of complexes in the area which are post-Archaic in the sense that they include pottery, but are pre-Caddoan because they lack the distinctive Caddoan style. The Bellevue Focus in northwestern Louisiana and the upper Fourche Maline Focus of eastern Oklahoma are examples of these "pre-Caddoan" ceramic complexes. In some degree these cultures appear to represent a transition from the Archaic to the fully developed Caddoan cultures, but in general their role in the development of the latter is not yet clear.

Taxonomic Position in Southeastern Archeology. For the sake of formal taxonomists, it may be said that the Gibson Aspect and the Fulton Aspect together make up a unit that, in the strict application of the Midwestern Taxonomic System, would be called the Caddoan Phase of the Mississippian Pattern. However, "Caddoan Phase" is not a term currently in use; mainly because the term "phase" is in widespread use in American archeology in another sense—synonymously with the Midwestern term "focus"—but also because the concept of "phase" as employed in the Midwestern Taxonomic System has been difficult to apply meaningfully in many areas, including this one.

It should further be pointed out that classifying "Caddoan" as a segment of something more general called "Mississippian," while a convenient pedagogical device and not without some meaning in terms of culture history, leaves much to be explained. "Caddoan" applies to the archeological evidences in a particular area, reflecting a particular segment of culture history. "Mississippian" is a much more generalized concept, signifying certain resemblances, and hence relationships, among most of the late prehistoric cultures of the Southeast. When an

archeological complex is identified as Mississippian, it naturally remains to be determined how, when, and why it came to have the particular Mississippian characteristics. This is a job which has not yet been accomplished for the Caddoan complexes. The chronological controversy already discussed points up some of the difficulties involved, and the contributions to the symposium by Drs. Webb and Griffin and their discussants elaborate the problem in some detail. Therefore, when we classify "Caddoan" as part of "Mississippian," this categorization should be taken to signify only that Caddoan materials are primarily related to certain other complexes in the Southeast. The nature of the relationship, in terms of historical events, is not yet fully understood.

Caddoan Archeology and Caddoan Linguistics. Finally, it should be noted that the term "Caddoan" is used by both archeologists and linguists, but it has distinct meanings in the two fields. In both cases, it is true, the term refers to phenomena related to the historic Caddo people. Archeologically, however, the term applies to the cultures directly ancestral to the Caddo, whereas linguistically it refers to a far-flung group of related languages, one of which is that spoken by the Caddo. The linguistic term is also often applied ethnologically to the historic tribes who spoke Caddoan languages: not only the Caddo themselves (who are thought to occupy the original homeland of the whole group), but also the "Plains Caddoans"—the Wichita, Pawnee, and Arikara, peoples of the Great Plains whose prehistoric ancestors in that region did not share in the Caddoan *archeological* tradition we have been discussing here. "Caddoan archeology" will doubtless eventually be tied in with the distinct prehistoric remains of the "Plains Caddoans"; the paper by Dr. Bell in this symposium bears on this matter. At present, however, the relationship of the Caddo proper to the Wichita, Pawnee, Arikara, while well demonstrated linguistically, has not been traced archeologically. "Caddoan archeology," then, applies to the study of the prehistory of only one member of the Caddoan linguistic group, the Caddo proper.

The University of Texas
Austin, Texas

Relationships Between the Caddoan and Central Louisiana Culture Sequences¹

CLARENCE H. WEBB

The major expressions of the central Louisiana culture sequence—Tchefuncte, Marksville, Troyville, Coles Creek, Plaquemine, Natchez—lie generally south and east of the Caddoan area. Caddoan sites are recognized down the Red River to central Louisiana; central Louisiana occupations are found in northern Louisiana and into Arkansas, examples being the Kirkham site (Lemley and Dickinson, 1939) on Little Missouri River, the Fredericks site (Ford, 1951) in Natchitoches Parish, Louisiana, and the Crenshaw site (Lemley, 1936; Dickinson, 1936) in Miller County, Arkansas. The last two sites are in the Red River valley.

Trade sherds and vessels have been found in both areas. From the Gibson Aspect Davis site in eastern Texas (Newell and Krieger, 1949) Krieger has identified sherds as *Marksville Stamped*, *Marksville Incised*, and *Chevalier Stamped*. Orr (1946, 1952) mentions Coles Creek types at the Spiro Craig Mound site, arbitrarily equating these with Spiro 1, but provenience and relationships with Caddoan materials at this site have not been made available. Harrington (1920: Pl. LXVIII, B) illustrated a *French Fork Incised* vessel from the Washington site (Haley Focus) and a cup (*ibid.*: Fig. 19) with *Marksville Incised* decoration from Cedar Glades. From Sycamore Landing on the Ouachita River, Moore (1909: Figs. 104–118) illustrated stone pipes very similar to Plaquemine pipes from Selsertown (near Natchez, Mississippi), also a vessel of type *L'Eau Noire Incised* (engraved in this instance), along with Caddoan pipes and vessels. In the late period, vessels of *Fatherland Incised* were shown by Moore (1909) from Keno

¹ This paper was presented at a symposium entitled "Relationships between the Caddoan Area and Neighboring Areas," which was a part of the program of the 23rd Annual Meeting of the Society for American Archaeology, held at the University of Oklahoma, Norman, Oklahoma, May 1–3, 1958. On the program this paper was entitled "Relationships between the Caddoan Area and Louisiana."

and Glendora. Similar Natchezan vessels have been found with late Caddoan wares at Camden on the Ouachita and at the Battle Mound site on Red River (these were observed in the collections and from the excavations of Frank Soday and M. P. Miroir respectively).

Conversely, Caddoan sherds have been found at a number of central Louisiana sites. From the secondary mantle and surface wash of the Crooks Mound, a Marksville site in La Salle Parish, Ford and Willey (1940) have illustrated sherds now identifiable as Caddoan types *Belcher Ridged*, *Sinner Linear Punctuated*, and *Maddox Engraved* (Bossier Focus types), as well as *Wilkinson Punctated* and *Harrison Bayou Incised* (Alto and Bossier Focus types). With these Caddoan sherds were Plaquemine types *Sanson Incised*, *Chevalier Stamped*, *Anna Interior Engraved*, sherds then called *Catahoula Incised* but now assignable to *Manchac Incised*, and *Plaquemine Brushed*. *Anna Interior Engraved* occurs in Natchez in addition to Plaquemine, and *Chevalier Stamped* begins in Troyville and extends through Coles Creek into Plaquemine. The authors lumped all of these Caddoan, Plaquemine, Coles Creek, and Natchez sherds as a late re-occupation, discounting their appearance in the secondary mantle as a technical field error, and stated that

after a period of desertion the structures were once more utilized by Indians, apparently some time very close to 1700 A.D. This latter occupation seems to have been a brief one, and is indicated by potsherds of late Caddoan, Natchez, and Tunican types mixed in the wash soil on the slopes of Mound A.

A priori conclusions of this type, understandable in 1940, are no longer tenable. Two other statements from this report are significant. (1) The authors stated that, with the error of identification of wash material corrected, the fill of the secondary mantle ceased to show "appreciable" amounts of the late types. (2) They were at a loss to explain the presence of *Sanson Incised* and *Catahoula Incised* sherds in pre-mound and burial platform levels, and again suggested that field errors could be responsible. A few sherds of these types in Marksville deposits should not be too surprising, particularly as a development from *Chinchuba Brushed* and diagonal incising in Tchefuncte. I found sherds of *Harrison Bayou Incised*, *Coles Creek Incised*, *Manchac Incised*, and one sherd of *Plaquemine Brushed* in the deeper levels of the Wiley Mound at Larto Lake, where the dominant sherd types were *Marksville* and *Troyville Stamped*, *Marksville Incised*, and *Churupa Punctated*.

From the Greenhouse site in central Louisiana Ford (1951) reported trade sherds that were identified by Krieger as Caddoan, including *Crockett Curvilinear Incised*, probable *Pennington Punctated-Incised*, and *Holly Fine Engraved* from Alto Focus ceramics, as well as possible Haley and Texarkana Focus types. Furthermore, *Hardy Incised*, *Wilkinson Punctated*, and *Harrison Bayou Incised* (included in the type *Beldeau Incised*, although punctations within the diamonds formed by cross incising were lacking) are types present in Caddoan pottery of the Alto and Bossier foci as well as in the central Louisiana ceramics. The analyses show that these Caddoan sherds and shared types came from Greenhouse levels assigned to both Troyville and Coles Creek periods.

On the Plaquemine level, the Medora site (Quimby, 1951) included *Hardy Incised* and *Harrison Bayou Incised* as major Plaquemine types. We have noted that these are also present in the Alto and Bossier foci (*Hardy Incised* is included by Krieger in type *Kiam Incised*). *Manchac Incised*, *Plaquemine Brushed*, *Dupree Incised*, and *Lulu Linear Punctated* are indistinguishable, in my experience, from corresponding types in the Bossier Focus of northern Louisiana. The Bayou Goula site (Quimby, 1957) had these same types, as well as *Rhinehardt Punctated*, which is shared by Bossier Focus and has similarities to *Pennington* type of Alto Focus. Therefore seven of the 16 Plaquemine decorated pottery types are generally indistinguishable from Bossier Focus Caddoan types. Some of these have earlier beginnings in Coles Creek and Alto in the two areas. One should note that these are utility wares, tending to be much longer lived than ceremonial or burial wares.

The Gordon site reported by Cotter (1952), originally the type site for Coles Creek, reveals Caddoan sherds in the state of Mississippi. This site goes through the transition from Coles Creek to Plaquemine, with the Coles Creek early enough to have *Marksville* and *Troyville Stamped*, *Yokena Incised*, and *Mulberry Creek Cordmarked* sherds, and the Plaquemine lasting long enough to include a few Natchezan criteria. *Hardy Incised* was the dominant type and *Coles Creek Incised*, *Manchac Incised*, and *Rhinehardt Punctated* were secondary types in the early levels, with progressive replacement of *Hardy Incised* by *Plaquemine Brushed* in the later periods. *Maddox Incised (Engraved)*, which reached this area from the Bossier Focus, was well represented at all levels. *Crockett Curvilinear Incised* sherds and carinated bowl shapes were other Caddoan pottery features. *Harrison Bayou Incised* type was present, and unidentified sherds had engrav-

ing with spurs or triangles, suggestive of *Haley Engraved*. Circular houses in the early period were succeeded by rectangular structures, and the analogy to Davis (Alto Focus) houses was suggested by the author. Rectangular structures with post holes in trenches, interrupted at the corners, are very similar to the Haley Focus pre-mound structure at the Belcher Mound site (Webb, 1959). Projectile points included several Archaic types, the "fir-tree" variety of *Alba* or *Scallorn*, one *Alba* type (called *Hayes*), and the "fish-tail" or "sword-fish" type found regularly at Plaquemine sites in Louisiana. "Fish-tail" projectile points in one of the Gahagan burial pits are more understandable when we note that they were found in the pre-mound Coles Creek level at the Gordon site.

Cotter (1952) links the Gordon, Medora, Davis, and Greenhouse sites as manifesting the primary features of Temple Mound I. He suggests that the progression from Troyville to Plaquemine appears to be of no long duration, with Coles Creek pottery types common to both, and that the interposition of Coles Creek as a cultural period is unnecessary. He thinks that the Gordon site provides the needed transition between Temple Mound I and Temple Mound II; at the culmination of Temple Mound II Plaquemine gave way to characteristic Natchezan. He suggests a similar transition in the Gibson Aspect at Alto, progressing from lingering Marksville and Copena traces toward true Temple Mound characteristics.

At the historic level Quimby (1942), in his summary of the Natchezan culture, illustrates from Angola the types *Wilkinson Incised*, which is a shell-tempered curvilinear incised Glendora Focus type, and *Hodges Engraved*, a clay-tempered Belcher and Glendora Caddoan type.

It may seem surprising that, despite these and many other evidences of trade and contact between Caddoan and central Louisiana cultures, there is serious disagreement concerning relationships and chronology. Ford (1951) and Sears (1958) have compressed the entire Caddoan sequence into the Plaquemine-Natchez time span, without elimination or compression of the Troyville or Coles Creek periods such as Cotter suggests. Krieger (Newell and Krieger, 1949) finds convincing reasons to equate Gibson Aspect inception with Marksville, and is supported by maize typology at the Davis site and C-14 datings. Since the Plaquemine beginning date is estimated at A.D. 1300 to 1500 by Quimby (1957) and the Marksville-Troyville C-14 datings cluster around A.D. 500 to 800, the variance of opinion is of serious proportions.

Time does not permit discussion of the many factors which remove

these differences of opinion from the area of intransigence or the maintenance of preconceived ideas. As examples of these factors, one could cite the conceptual differences expressed by Cotter and Quimby concerning the Plaquemine period, the sweeping movements of ceramic traits recounted by Ford, differences in typing methods in the two areas, the long life span of certain pottery and other artifact types, and spatial as contrasted with temporal variations in ceramic techniques.

I have attempted to clarify Caddoan-central Louisiana interchanges by a study of surface sherd collections and ten site excavations in the chief contact zone across northern Louisiana. Our surface collections include over a hundred sites, but I have particularly studied the 20 larger collections, each of which yields between 100 and 1200 decorated sherds.

The Tchefoncté culture has not been found in northern Louisiana or the entire Caddoan area. It can be eliminated from direct comparison, but one notes that the linear punctated Tchefoncté type *Lake Borgne Incised* looks like a good ancestor for the Bossier Focus type *Sinner Linear Punctated*. Our recent finding of *Sinner Linear Punctated* vessels with Haley and Alto Focus types in Mineral Springs Mound burials, and the presence of linear punctated sherds at the Troyville, Crooks, and Wiley sites narrows the gap between these types.

On the Marksville level, the Fredericks site in Natchitoches Parish has been termed Marksville or Troyville by Ford (1951). Our sherd collection includes zoned dentate and rocker stamping which may be interpreted as both *Marksville* and *Troyville Stamped*, as well as *Marksville Incised*, *Churupa Punctated*, *Mulberry Creek Cordmarked*, *Mazique* and *Chase Incised*, and plain with notched rims. No Caddoan sherds have been found on this site. Other sites in northwestern Louisiana on this time level are included in the Bellevue Focus, of which four mound sites have been excavated. Significant traits are flexed burials, cremation, primary platforms in small conical mounds, late Archaic lithic artifacts, and small beads of stone and rolled copper. The preponderantly plain pottery is clay-, sherd-, or bone-tempered. The few decorated sherds are unidentified incised, plain sherds with transverse or oblique lip incisions, *Marksville Stamped*, and *Churupa Punctated*. The Bellevue sites belong to a single culture period, no Caddoan or Coles Creek pottery types or small projectile points having been found.

All other pottery-yielding sites in northwestern Louisiana, from which we have collections, have Caddoan sherds, mainly of Bossier

Focus types (Webb, 1948). Tabulation of some 35 pottery types from the 20 sites (five mound and 15 village sites), and grouping the sites in accordance with the combined frequencies of six major Bossier pottery types which would not be confused with Coles Creek or Alto types—*Maddox Engraved*, *Belcher Ridged*, *Sinner Linear Punctated*, *Pease Brushed-Incised*, *Bossier Brushed*, and *Karnack Brushed*—shows three distinct groupings:

(1) Group 1, comprising two mound and six village sites, shows the combined Bossier types to total 12.4 to 27.6% of the decorated sherds. Alto Focus wares, judged by the distinctive types *Holly* and *Hickory Engraved*, *Weches*, *Crockett*, *Pennington*, and *Davis*, are well represented, with combined frequencies of 6.7 to 14% from six sites, 1.6% at one, and 26% at another. Only a few distinctive Haley Focus sherds are found.

Six of these eight sites have distinctive Coles Creek sherds, judged by the types *French Fork Incised*, *Chase Incised*, *Chevalier Stamped*, *Beldeau Incised*, and *Coles Creek Incised* (with subjacent triangles or incisions along a flat lip), in combined frequencies of 2 to 8% of decorated sherds from four sites, less than 1% in the other two. Moreover, two of these sites have one to two sherds of *Churupa Punctated* or *Mazique Incised*, and one site lacking Coles Creek sherds has three sherds of *Marksville* or *Troyville Stamped*.

(2) Group 2, represented by one mound and six village sites, had 39 to 59% of the decorated sherds represented in the combined Bossier Focus types. One would assume that these well-developed Bossier sites are later than Group 1, and this is borne out by the fact that the listed Alto types total less than 1% from five of the seven sites. One site has 4% Alto, chiefly *Davis Incised*. It also (the only instance in Group 2) has Coles Creek sherds, totaling 4% among the listed types, and one sherd of *Marksville Stamped*. A second site of Group 2, lacking Coles Creek types, has three sherds (out of 1948) of *Marksville Stamped*. These Group 2 sites have Plaquemine types like *Evangeline Interior Incised* and *Dupree Incised*, whereas *Evangeline* was lacking and *Dupree* rare in Group 1. The broad line incising of *Sanson Incised* increases in frequency to as high as 5% in two of the Group 2 sites. Sherds with curvilinear incising of grouped lines increase in frequency to 1 to 4%, compared to less than 1% in all but one site of Group 1.

(3) Group 3 consists of three mound and two village sites in which the stated Bossier types increase to 70–79% of decorated sherds. Four of these five sites have no Coles Creek, Marksville, or Troyville types;

two of these four have no Alto or Haley, the other two having 1% or less. The fifth site has three sherds of *Crockett Curvilinear*, one each of *Coles Creek Incised* and *Troyville Stamped*. *Dupree* and curvilinear incising continue, there is a considerable increase in brushing, red filming increases, occasional sherds of shell-tempered or porous light wares occur, as well as *Belcher Engraved* and *Cowhide Stamped* types. These facts indicate that Group 3 is approaching Belcher Focus times.

The rarity of shell tempering shows that none of the 20 sites are late Caddoan. From the 20 sites more than 12,000 sherds were examined. Only 55 sherds from six sites are shell tempered, and 42 of these are from a recognized Glendora Focus component at Smithport Landing. This leaves 13 shell-tempered sherds among the 11,000 (0.1%) from the other 19 sites. All Group 1 sites except Smithport and four of the Group 2 sites are totally lacking in shell temper. By comparison, shell tempering totals 3% in Belcher Focus levels at the Belcher site and 50% or more in Glendora Focus sites at Natchitoches and near Shreveport.

I omitted from the distinctive Bossier, Alto, and Coles Creek sherd tabulations the types *Hardy*, *Harrison Bayou*, *Dunkin* and *Manchac Incised*, *Wilkinson* and *Rinehardt Punctated*, because I have found it impossible to allocate these utility types specifically to Coles Creek, Plaquemine, Alto, or Bossier ceramics—they generally occur in all. *Hardy Incised* shows levels of 14 to 30% in Group 1, dropping to levels below 10% in Group 2 and below 5% in Group 3, except in two sites of Group 2, one of which maintains 4% *Coles Creek Incised*. Sherds of *Dunkin* and *Manchac Incised* types are generally not separable; they diminish markedly in Group 3. *Wilkinson Punctated* is at levels from 5 to 15% in Group 1, decreasing in most of Group 2 and Group 3, but is still present from all but one Group 3 site. Sherds of *Rhinehardt Punctated*, random punctated, *Pennington Punctated Incised* and *Dupree Incised* are often difficult to separate, except when *Pennington* appears on the typical bowl form in those Group 1 sites where Alto is well represented. Punctations were made with pointed, rounded, flat-tipped, and circular tools; crescentic, comma-shaped, rectangular, circular, triangular, and nail punctations occur, free or in zones, alternating with incised areas or plain areas. All punctations are more frequent in Group 1, progressively declining thereafter; triangular punctations and typical *Pennington* are infrequent or absent from Group 2 and Group 3 sites. Although zoned punctations continue, punctations in single rows between horizontal lines are found only where Coles Creek and Alto types are present.

In summary, these site studies give evidence that Bossier Focus ceramics developed in northern Louisiana out of Coles Creek and Alto; there was close parallelism between the appearance of Coles Creek and Alto ceramic types in this area in Group 1 sites and their progressive diminution and disappearance in Groups 2 and 3 as Bossier Focus developed fully. Contemporaneity of Plaquemine and Bossier is indicated by trade sherds and shared types in Group 2 sites. These studies and other evidences indicate that Bossier Focus lasted for a rather long time, was manifested from the Ouachita River in the Camden area completely across northwestern Louisiana to dip into eastern Texas, and was at least partially contemporaneous with Haley Focus, judging by the shared types *Maddox Engraved*, *Sinner Linear Punctated*, and *Pease Brushed-Incised* (which we found with Haley ceramics in Mineral Springs Mound burials, Howard County, Arkansas). The intrusion of Belcher Focus down the Red River into northern Louisiana probably occurred at or near the end of Bossier times.

Excavations at the Mounds Plantation in Caddo Parish, Louisiana, give an opportunity to check the contemporaneity of Coles Creek and Alto, which is indicated above in the surface collections. The Sanson site on Catahoula Lake offers a similar check on Plaquemine and Bossier. At the Mounds Plantation, a large temple-mound-with-plaza site, a refuse deposit exposed along the sides of a drained borrow pit, therefore presumably pre-mound, yielded over 400 sherds, 33% of which are bone tempered, all others clay tempered. Many of the bone-tempered sherds are from large, thick-walled plain vessels; 14 sherds are black polished plain. Decorated types include *Coles Creek Incised*, triangular punctated, *Hardy Incised*, *Davis Incised*, black polished engraved of uncertain type, *Wilkinson Punctated*, and *Sanson Incised*. During 1957 Mound B at this site was trenched by a friend who allowed me to study the sherds removed by approximately one-foot levels. From the pre-mound level there are *Hardy*, *Coles Creek*, and *Davis Incised* (one bone tempered), thin burnished, and thick plain sherds. The mound fill to the six-foot level contained the same types, as well as *Pennington* and *Hickory*. *Davis Incised* is particularly frequent, as it is in all collections from this site, totaling 22% of the decorated wares. An occupation level at six feet above the base yielded many sherds of *Holly Engraved*, also *Hickory*, *Davis*, *Crockett*, *Wilkinson*, *Hardy*, *Chase*, and *Coles Creek Incised* (including subjacent triangles, triangles between incised lines, rim thickening, and lip incising). At the eight-foot level there were *Hardy*, *Davis*, *Hickory*, *Pennington*, and *Wilkinson* types, and these continued to the surface.

From the surface and mound wash, these same Alto and Coles Creek types were found, also *Harrison Bayou*, *Beldeau*, and triangular, circular, and crescentic punctated sherds. An intrusive burial into the mound had *Maddox Engraved* and *Belcher Ridged* pottery, presumably a later Bossier burial.

The Sanson site on Catahoula Lake, central Louisiana, has evidence along the beach of occupation from Archaic through Plaquemine times. Excavation of a mound by a local resident during the early 1930's produced many whole vessels and sherds, the vessels associated with evidences of cremation, along with stone beads, polished stone artifacts, stone and pottery pipes, and a cache of small projectile points with pointed stems similar to *Bassett* and *Perdiz* types of the Fulton period. Pottery sherds included Coles Creek, Plaquemine, and Bossier types, also *Cowhide Stamped* sherds which could pertain to Belcher or Bossier wares. Whole vessels are assignable to Plaquemine and Bossier types, including a number of the type *Maddox Engraved* (one incised). The trait of "killing" the vessel was present, some in the process of manufacture, others by punching a hole in the base after firing. This site offers convincing evidence of contemporaneity of Plaquemine and Fulton periods.

A word should be added about the "Pre-Caddoan" burials at the Crenshaw site, with vessels identified by Ford (1951) as *Coles Creek Plain*, *Coles Creek Incised*, *Greenhouse Incised*, *French Fork Incised*, and *Rhinehardt Punctated*. Ford (1951) and Dickinson (1936) both mentioned differences in vessel shape, paste characteristics, and surface finish from Coles Creek vessels of central Louisiana. Ford attributed this to temporal lateness in the Coles Creek period, but I submit that these are characteristics seen often in Gibson Aspect Caddoan ceramics, especially the insertion of pigment into the decoration lines and red filming over the entire surface (traits never found in central Louisiana Coles Creek). Other Gibson characteristics of these burials are the orderly placement of many extended burials in large pits, flooring of the burial pits with multicolored sands, generous burial offerings, caches of small projectile points (of a type similar to *Hayes*), long-stemmed pipes, and turtle carapace rattles. This adds up to modified Coles Creek pottery in typical Gibson Aspect burials, evidence which is more suggestive of contemporaneity than of Coles Creek antecedence.

In conclusion, I would agree with Cotter's thesis of close parallelism between central Louisiana and Caddoan cultural development after Marksville times, except that I would prefer elimination of the Troy-

ville concept, which we cannot identify in the Caddoan area, whereas we can readily identify Marksville, Coles Creek, Plaquemine, and Natchez ceramics. The same sweeping changes are seen at the end of Marksville times in both areas—temple mounds, plaza arrangement, large circular houses shifting to squared, introduction of small arrow projectile points, scroll motifs, polished vessel surfaces, and many others, also closely paralleled by early Mississippian developments. With clarification of the terminal Marksville-Troyville-Coles Creek confusion, one should be quite comfortable in equating Coles Creek with Gibson Aspect Caddoan; Plaquemine with Bossier, Belcher or other protohistoric Fulton Aspect Caddoan; Natchez with Glendora Focus contact period Caddoan. This is true whether one judges by general cultural context, by closely related or shared traits, or by actual trade items.

Addendum. Since completion of this paper, a report has been received from the Humble Oil and Refining Company Research Laboratory, Houston, Texas, of two radiocarbon assays from the Belcher Mound site, Caddo Parish, Louisiana, which bear on this discussion. (1) Run No. 320, charcoal from charred timber, House 4, pre-mound level beneath Mound B, on a Haley-Alto Gibson Aspect level, yielded a date of 1100 ± 100 years before the present. (2) Run No. 322, charcoal from charred timber, House 7, Primary Mound A, on a Belcher Focus, Fulton Aspect level, yielded a date of 200 ± 100 years before the present. If these dates hold up, this gives a time span of 900 years or more at this site, with Bossier Focus occupation intervening between the dated levels, and places the Gibson occupation at a time shortly after most Marksville-Troyville C-14 dates.

References Cited

- Cotter, John L.
1952. The Gordon Site in Southern Mississippi. *American Antiquity*, Vol. 18, No. 2, pp. 110-126.
- Dickinson, S. D.
1936. Ceramic Relationships of the Pre-Caddoan Pottery from the Crenshaw Site. *Bulletin of the Texas Archaeological and Paleontological Society*, Vol. 8, pp. 56-69.
- Ford, James A.
1951. Greenhouse: A Troyville-Coles Creek Period Site in Avoyelles Parish, Louisiana. *Anthropological Papers of the American Museum of Natural History*, Vol. 44, Part 1.
- Ford, James A., and Gordon R. Willey
1940. Crooks Site, A Marksville Period Burial Mound in La Salle Parish, Louisiana. *Louisiana Geological Survey, Anthropological Studies*, No. 3.

- Harrington, M. R.
1920. Certain Caddo Sites in Arkansas. *Indian Notes and Monographs*, No. 10. Museum of the American Indian, Heye Foundation.
- Lemley, Harry J.
1936. Discoveries Indicating a Pre-Caddo Culture on Red River in Arkansas. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 8, pp. 25-55.
- Lemley, Harry J., and S. D. Dickinson
1939. Evidences of the Marksville and Coles Creek Complexes at the Kirkham Place, Clark County, Arkansas. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 11, pp. 139-189.
- Moore, Clarence B.
1909. Antiquities of the Ouachita Valley. *Journal of the Academy of Natural Sciences of Philadelphia*, Vol. 14, pp. 1-170.
- Newell, H. Perry, and Alex D. Krieger
1949. The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology*, No. 5.
- Orr, Kenneth G.
1946. The Archeological Situation at Spiro, Oklahoma: A Preliminary Report. *American Antiquity*, Vol. 11, No. 4, pp. 228-256.
1952. Survey of Caddoan Archeology. In: James B. Griffin (editor), *Archeology of Eastern United States*, pp. 239-255. University of Chicago Press. Chicago.
- Quimby, George I., Jr.
1942. The Natchezan Culture Type. *American Antiquity*, Vol. 7, No. 3, pp. 255-275.
1951. The Medora Site, West Baton Rouge Parish, Louisiana. *Field Museum of Natural History, Anthropological Series*, Vol. 24, No. 2, pp. 81-135.
1957. The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology*, Vol. 47, No. 2, pp. 91-170.
- Sears, William H.
1958. Burial Mounds on the Gulf Coastal Plain. *American Antiquity*, Vol. 23, No. 3, pp. 274-283.
- Webb, Clarence H.
1948. Caddoan Prehistory: The Bossier Focus. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 19, pp. 100-147.
1959. The Belcher Mound, A Stratified Caddoan Site in Caddo Parish, Louisiana. *Memoirs of the Society for American Archaeology*, No. 16.
1560 Line Avenue
Shreveport, Louisiana

Discussion

By Alex D. Krieger

Webb has analyzed the relationships between the Caddoan cultural block and the lower Mississippi Valley with great skill and insight. His general correlation of Gibson Aspect with Coles Creek, and Fulton Aspect with Plaquemine, plus the importance of Bossier Focus and

his qualifications about Troyville, seem to me to be as satisfactory as is possible in present knowledge; I can do little more than emphasize some of the points he makes.

Ford's contention that both the Gibson and the Fulton aspects can be correlated with Plaquemine can be refuted in many ways, as Webb has shown; see also my review of Ford's Greenhouse Site publication in *American Antiquity* (Vol. 18, 1952: 175-179). It is possible, moreover, that these divergent views might be more or less reconciled if more emphasis (and future research) were placed on one point mentioned by Webb, namely, that utility wares and "ceremonial or burial wares" (which I prefer to call "fine wares") present different chronological problems. As is well known, these two general categories are apparent through vast areas in South America, Middle America, and the Southwest; and wherever chronology has become well controlled it is also apparent that the coarse or utility wares underwent stylistic changes much more slowly than the "fine" wares. Caddoan ceramics likewise reveal this duality, perhaps more so than any cultures in the United States outside the Southwest. In this case, however, chronological control over the respective rates of change in these wares is still crude, but is progressing.

Comparisons between Caddoan and lower Mississippi Valley ceramics now appear to make this matter somewhat clearer, through Webb's research as well as, formerly, my own. First, it now seems rather clear that when a few pottery types are somewhat similar in Gibson and/or Fulton Aspect foci, and Plaquemine, or still present knotty problems in type inclusiveness and specific association with cultural units, these types are in the utility category as Webb has shown. Second, it seems clear that the identification of specific and distinctive types of "fine" pottery of the Gibson Aspect, such as *Holly Fine Engraved*, in a Plaquemine assemblage, is quite erroneous; a few years ago Webb pointed out to me how far off these "identifications" are. The position of Louisiana archeologists that *all* Caddoan material belonged at the top of the Louisiana chronological column was understandable as long as no chronological depth had been claimed or demonstrated in Caddoan archeology; but I think the time is long past for this position to be defensible.

At present it seems more important that we work on the problem of whether the Gibson Aspect—or more specifically, the Alto Focus—was contemporaneous with all or part of the Coles Creek period, or with both Troyville and some part of Coles Creek. The identification of a Troyville complex or period outside of a small area in central

Louisiana has long been a puzzle to everyone concerned. Coles Creek, on the other hand, spread over a considerable area in central and northern Louisiana, reaching into southern Arkansas and slightly into northeastern Texas; trade vessels from it are found as far north as the Spiro site in Oklahoma.

There are now some 16 radiocarbon dates which Ford has assigned to Troyville and Coles Creek. They form two distinct groups, that for Troyville ranging from about A.D. 500 to 1100, and that for Coles Creek from about A.D. 800 to 1250. It is not surprising that the two series overlap, for no one has claimed that the change from Troyville to Coles Creek was abrupt or easy to trace.

In his paper Webb states that he favors elimination of the Troyville concept, presumably because it has such a small distribution when compared with Coles Creek. Others have also suggested this, but I don't know what should be done with it. The term Troyville marks the first appearance of temple mounds in Louisiana, but it might be feasible to regard the whole sequence of dates from about A.D. 500 to 1250 as "Coles Creek," then divide this into "early" and "late" phases, with the "early" phase marking the introduction of temple mounds. I would rather leave this to the people who are working in that area now.

There is but a single radiocarbon date for the Alto Focus at the Davis site, 1553 ± 175 years, obtained in 1951, which would be roughly A.D. 400 ± 175 . Considering the margin of error, this date may not be very different from the earliest one assigned to Troyville at about A.D. 500. Even if not completely accurate, it is hard to see how the actual date could be as late as the block of A.D. 800 to 1250 assigned by Ford to Coles Creek. I would rather think that an approximate date of A.D. 500 would apply to the introduction of temple mounds both at Troyville and at the Davis site. Here we seem to be "stuck" at present.

As for the identification of Marksville and Troyville sherds found in Texas, I showed the Davis site sherds to several people, among them Quimby, Griffin, and MacNeish. Ford was then working in South America. The aforementioned persons all agreed that some of the Davis sherds were good examples of *Marksville Stamped* and *Marksville Incised*, and another as *Chevalier Stamped* of the Troyville period. Griffin also identified two sherds as *Montgomery Incised* of the Adena culture. These were all reported as such in the Davis site monograph. Later, MacNeish identified another rocker-stamped sherd as inseparable from Hopewellian pottery in Illinois and Wisconsin (see my review of the Greenhouse publication mentioned above, Fig. 79). There was no indication of a pre-Alto Focus occupation of the site, so

far as I could tell from Newell's field notes, which were extremely painstaking.

We should also remember the common occurrence of Copena "points" or knives in the Alto, Gahagan, and other Gibson Aspect foci, the large rectangular graves with rows of parallel skeletons and piles of offerings in the grave corners, a trait shared only with Hopewell and the Miraflores complex in Guatemala, and many other interesting traits which were pointed out in the Davis site monograph and which are all persistently ignored by those who would have the Alto Focus begin as late as A.D. 900 or even 1400.

I no longer think that the Alto Focus could have appeared during Marksville time, but I do think it began soon afterward with the appearance and spread of the temple-mound idea in the Southeast, and that there were numerous trait survivals from the Hopewell-Marksville period into this early temple-mound horizon. There must have been some individuals in early Troyville communities who were still making Marksville pottery, and so on. I prefer to see archeological situations as fluid rather than "layer-cakes" in which cultures suddenly end and others just as suddenly begin. In the Southeast there are far too many preconceptions as to how things *should* be, even to the point of rejecting all radiocarbon dates which don't suit the preconceptions. This is interesting in itself, because in most parts of the world the datings have caused a lot of reconsiderations and revisions in previous thinking.

I have many times said that the Caddoan-lower Mississippi Valley cultural situation is comparable to the Southwest in area, time depth, and complexity of interrelationships; but whereas in the Southwest scores or even hundreds of able students have worked for many years on its problems, only six or eight have done intensive research in Caddoan archeology. Obviously, much is yet to be learned about it.

209 Lake Washington Blvd.
Seattle 22, Washington

By James A. Ford

This disagreement in cross-dating of the Caddo area boils down to whether it was an explosive affair of four centuries or a leisurely one of 12 centuries. The hard remarks about the Midwestern system have been against those who try to use it to derive information. For the central Louisiana materials Willey once suggested the term Gulf Tradition. The argument presented by Webb is based on burial units. In the Mississippi Valley we have used refuse statistics, so that the

periods are cut from a continuum and are not discrete units as in the Caddoan Area.

Louisiana and Florida share the meander, negative excising and later a reversal of this, quadration, and other traits derived from Hope-well and later Mississippi. The Caddoan Area is distinguished by engraving with pigment and bottle forms, and these are derived from Mexico. Most of the arguments about contemporaneity are based on the occurrence of traits shared between Louisiana and Texas. The problem is whether they came from the Mississippi or the other way. No carinated bowls are found in Marksville or Troyville; they enter in late Coles Creek. In the Plaquemine period these Mexican traits move into the Mississippi area, going up to St. Louis and across to Alabama and Georgia, becoming part of the Mississippi pattern. This is a different situation from that of the cult materials, which go all over the eastern United States. We are arguing matters discussed ten years ago and we need new information.

American Museum of Natural History
New York, N. Y.

Relationships Between the Caddoan Area and the Mississippi Valley¹

JAMES B. GRIFFIN

Some years ago I published "An Interpretation of the Place of Spiro in Southeastern Archaeology" (Griffin, 1952), which clearly aligned the ceremonial efflorescence at the Spiro site with the developed Southern Cult. It was clear to me then that Spiro must be regarded as essentially contemporaneous with many cultural elements moving from the Mississippi Valley to eastern Oklahoma. In that paper I belabored certain views of Caddoan development which Krieger favored at the time. Subsequently, I have found that while some archeologists dealing with the Mississippi Valley have been able to read, and understand, this paper (Williams and Goggin, 1956), that the Caddoan area students, by and large, have either not read it, or were so disenchanted with the point of view that they do not even attempt to refute it.

In my preparation for this current Caddoan session I have been stimulated by Bell's (1953) short paper summarizing certain grave groups from the Craig Mound and Baerreis' (1957) paper presenting his views on the relationship between "The Southern Cult and the Spiro Ceremonial Complex." In this paper Baerreis proposed an admirable method of attack to a developmental sequence within the Caddoan area and a comparison of Caddoan culture and its ceremonies with that of the area to the east. His interpretation, however, that there is a Spiro Ceremonial Complex in eastern Oklahoma which precedes and is antecedent to the Southern Cult, representing a time level at which possible Hopewell influences are to be sought, is unsound and unsatisfactory.

It is somewhat difficult to assess adequately the exact temporal position of the burial groups described by Bell, but they are certainly somewhere within the Spiro Focus as the term is used by Baerreis.

¹ This paper was presented at a symposium entitled "Relationships between the Caddoan Area and Neighboring Areas," which was a part of the program of the 23rd Annual Meeting of the Society for American Archaeology, held at the University of Oklahoma, Norman, Oklahoma, May 1-3, 1958.

Burial 7 was a large multiple grave containing about 20 individuals. It had 8 pottery vessels, 114 flint projectile points and a few other artifacts. There were two bottle forms, one engraved and the other incised. Vessel B7-8 is a low bowl with incurved rim and lug handles which is shell tempered. One of the jars has a flat-bottomed squared base. As a group the vessels are good Spiro forms.

Burial 9 was a multiple burial containing several skeletons. As grave offerings there were 9 pottery bowls, and Bell included drawings of three of them. B9-4 is a red filmed, almost certainly shell-tempered bowl with a small effigy head projecting upward and slightly inward from the upper rim. B9-16 is also an ovoid effigy bowl. Vessels B9-19-12-5 and 22 are also red-filmed ovoid bowls, and a hasty examination before the meeting leads me to believe they are also shell tempered. The following listing, from Bell, of other grave goods is important because they are primarily items of Baerreis' Spiro Ceremonial Cult. There were 2 pottery pipes, 3 stone ear spools, 1 stone disc, 6 polished flint flared celts, 2 large polished stone spuds, 1 copper needle or bodkin, and a few other items.

Burial 51 was a secondary burial containing 11 skeletons. There were six associated pottery vessels, three of which are *Spiro Fine Engraved* and have the contracting bottle neck ascribed to Gibson Aspect forms. One of the vessels, B51-11, is a shell-tempered, strap-handled *Barton Incised* jar. Other artifacts include: 24 stone ear spools; 8 wooden ear spools; 13 stone discs; 1 copper disc; 1 stone bead; a wide variety of shell beads; pearl beads; basketry; pieces of wood and galena; and a few other items.

Burial 99 was a secondary burial of at least one individual. The grave offerings contained 3 of the major stone effigy pipes, 4 other stone pipes and a pottery pipe, 2 stone ear spools, and 475 flint projectile points. A very significant additional trait was a shell-tempered hooded effigy bottle of clear Middle Mississippi inspiration and origin.

Burial 162, a large secondary burial of 4 individuals, had 10 pottery vessels. Vessel 162-19, not illustrated by Bell, is a shell-tempered tripod on a stand. This vessel had strap handles, as did a flat-bottomed jar with two rows of nodes. Among the other artifacts were 2 engraved shells, 14 projectile points, 2 clay pipes, 1 stone ear spool, 1 copper bodkin, and a few other items.

It has now been established that with a significant number of burials within the Craig Mound there are pottery vessels which are clearly of Middle Mississippi origin, either by trade or by some other means. It would be interesting to learn some day what proportion of vessels and

sherds from the Craig Mound are shell tempered. The hooded effigy bottle is of a type most common in southeast Missouri and western Kentucky, while the shell-tempered incised rim jar most closely resembles *Barton Incised*, which is a type that is very common in northeast Arkansas.

A great many of the projectile points from the Craig Mound are the small triangular side-notched forms, sometimes also with a basal notch. These are much more common at Craig than at many other Caddoan sites. They do not, I think, originate in the Caddoan area but are connected to similar forms from the Ohio Valley and to the southwest.

In Baerreis' paper the view is expressed that perhaps there is a Spiro Ceremonial Complex which may have antedated the Southern Cult but that some of the following list of traits may have lasted up into the period of the Southern Cult. These Spiro Ceremonial Complex traits are ear spools of stone and wood, T-shaped pipes of stone and clay, human and animal effigy pipes, equal-armed pipes, elongate celts, caches of delicately manufactured projectile points, copper rods, and chipped stone blades. The article states that

. . . these elements crystallized to form a local ceremonial complex which antedated the Southern Cult. Later, some of the elements combined with Mexican traits to form the characteristic Southern Cult. Thus, for eastern Oklahoma the Spiro Ceremonial Complex is the direct antecedent of the Southern Cult and represents the time level at which possible Hopewell influences are to be sought (Baerreis, 1957: 37).

Before commenting on this point of view expressed by Baerreis some observations from additional sites will be presented. The Norman site is one usually placed in the earlier part of the Caddoan continuum, and it is equated approximately in time with the Craig Mound. Indeed, a number of the stone ear spool forms at Craig and Norman are said to be very similar and may be regarded as essentially contemporary. At the Norman site I noticed in Finkelstein's report (1940) mention of 2 copper-plated stone ear spools associated with 2 large clay discs, cane matting, 3 double-stemmed shell-tempered clay pipes, 1 double-stemmed pipe of stone, a human effigy stone pipe, and a shell-tempered bottle. One of the copper effigy plates at Norman was associated with a shell-tempered jar. A second copper plate was associated with copper-plated stone ear spools, a shell-tempered bottle and a shell-tempered jar. Additional artifact traits from Norman include a small hooded human shell-tempered bottle, a ring-base bottle with a globular body, shell-tempered elbow pipes, and strap handles on jars.

The Brackett site, which had a small number of stone ear spools

(all of Baerreis' Type A), has a ceramic complex which also clearly equates it with Craig and other suggested "early" Caddoan sites. These include *Spiro Engraved*, *Hickory Fine Engraved*, *Crockett Curvilinear Incised*, a *French Fork* bowl, and a strap-handled *Spiro Engraved* jar (Baerreis, 1955). There is also a human male effigy vessel which Robert Bell informed me he thinks is shell tempered. There is a large amount of shell-tempered pottery at this site which is called *Woodward Plain* in the Caddo country. There were two clay elbow pipes, and one of these is shell tempered.

At the Nagle site near Oklahoma City (Shaeffer, 1957), there were two stone ear spools of Type A, one with a multiple cross and the other with the six-pointed star design. Some of the projectile points are similar to the Cahokia side-notched forms. The flat-bottomed *Woodward Plain* jar is also present. Shaeffer has suggested a date of A.D. 1300 for the Nagle complex.

It is assumed by most Mississippi Valley archeologists that shell tempering, as a characteristic of Mississippian cultures, originated somewhere between Memphis and St. Louis and spread out from there. Under this assumption, which has not yet been proved, the shell tempering known from the Caddoan area would be viewed as having spread from east to west. Not only have the sites listed above, Craig, Brackett, and Nagle, a considerable amount of shell-tempered pottery, but they also have effigy bowls, human and blank face effigy bottles, ring-stand bottles, and tripod forms which are much more at home in the eastern Arkansas and southeast Missouri area than they are in the Caddo country. Some of these were almost certainly carried in from the developed Mississippian effigy complex. It is also possible that the *Barton Incised* jar with Burial 51 at Spiro is a trade vessel. Williams and Goggin (1956: 54) regard *Barton Incised* as a Late Mississippi type; and while the style of decoration is not necessarily always late (Phillips, Ford, and Griffin, 1951: 114-119), its association with strap handles is bound to be relatively late within the Mississippi period, if comparative and stratigraphic information is significant in archeological interpretation.

The correlations and identifications made above do strengthen the position taken in earlier papers (Griffin, 1946: 85-92; Griffin, 1952). The first of these papers was largely written in 1939 and 1940 and in no way followed or was stimulated by Ford and Willey (1941). The second was a presentation designed to point out the impossibility of Krieger's (Newell and Krieger, 1949) interpretations, which I think Baerreis unfortunately followed in the paper mentioned above. It is

curious that Baerreis included the spud or elongate celt as a component of an early Spiro Ceremonial Complex when I thought I had indicated its presence not only at some of the major sites listed by Baerreis but also at other sites in the east, including some rather securely within the mature Mississippi and Southern Cult period. Furthermore, it should have been clear that Spiro is on the extreme western margin of the distribution of this form and that Gahagan is on the southwestern margin of its distribution. Baerreis apparently wrote much of his paper by 1943 and may not have cared to substantially revise or reorient it before publication in 1957.

Baerreis also included large chipped stone blades, such as those illustrated by Hamilton (1952: Pl. 46), but it is my understanding that a significant proportion of these are made from Duck River flint from western Tennessee, and this same material and form appears at a number of centers in the Southeast of the Southern Cult. It might also be added that at least some of the polished flint celts at Spiro were made from a whitish flint from the Cahokia area and that these same polished celts are also found at that site.

The Caddoan style ear spools which Baerreis has grouped into a number of distinctive types are another matter, and somewhat difficult to deal with, because their distribution is largely within a relatively restricted area of the general Caddoan territory. There may well be a sequence of development within the Caddoan area, but Baerreis has not presented it because of the lack of sound stratigraphic or temporal placement at the time he wrote his paper. We can, however, do something with the designs of the decorated ear spools. The cross and the excised multipointed star and cross are conspicuous elements of the Southern Cult, while the six-pointed star and the six-pointed star and eye are found on painted pottery vessels of the cult period in the central Mississippi Valley. In fact, a significant number of the designs on the distinctive Caddoan ear spools are ones held in common during the period of the growth and spread of the Southern Cult. The history of the various types of Caddoan ear spools should not be equated with the history of the various designs which appear on them. The designs I have just mentioned are ones which are apparently on the western margin of their distribution and have moved to the Spiro Focus ear spools which are a localized Caddoan development. The historic development of the Caddoan ear spools needs to be carefully worked out, now that an acceptable classification has been provided, and also careful studies made of the historical development of the designs associated with the Southern Cult.

A few years ago, while Gregory Perino was excavating Mound 34 at Cahokia and in the surrounding area, for the Thomas Gilcrease Foundation, Mr. Gilcrease found a cache of eleven stone ear spools 3" in diameter. Some of these have a circle and square design on the outer face. They had been covered with copper and were found in the cemetery area between Mounds 19 and 20. W. K. Moorehead (1929: Plate XXVII, Fig. 6) illustrates what I take to be a Spiro type ear spool from the same Ramey property area. In the University of Michigan excavations at Mound 34 we recovered materials which, because of their quality and variety, we regarded as representative of the Cahokia "climax." This climax was postulated as taking place at the close of the Old Village Focus, or to use Kidder's term "phase," of Middle Mississippi development at Cahokia. It was also postulated that this climax occurred *after* the splinter groups had moved north to Aztalan, the northern Mississippi Valley, and into the central Mississippi Valley. We found, at Mound 34, examples of Caddoan style engraving on sherds and an engraved "conch" shell fragment.

In Perino's more extensive excavations in the same mound were a number of Caddoan-like highly polished engraved sherds with shell temper, additional examples of engraved conch shells, negative-painted sherds suggestive of southeast Missouri and Nashville negative painting (Phillips, Ford, and Griffin, 1951: 173-177), and the small stemmed points of jasper which are clearly intrusive from the Caddoan area. At present we can state that on the basis of a radiocarbon date from beneath Mound 34 (M-33, Crane, 1956) at A.D. 1159 ± 200 , and on M-635 (Crane and Griffin, 1959) for a "ceremonial" fire in association with activities at the mound after it was built at A.D. 1289 ± 200 , that the complex with rather clear association with the Cahokia Climax and with Spiro, will date A.D. 1150 to 1300, give or take a few years. We can be reasonably certain that the proto-Chiwere movement north from Cahokia, with its Old Village economy, took place around A.D. 1000 or a bit earlier (Griffin, 1960).

The pipe complex as presented by Baerreis deserves some comments, for the varieties of pipe forms in the Caddoan area should be amenable to both classification and a temporal alignment. Baerreis recognized that there were a variety of pipes to which the term "T-shaped" had been applied and that a number of distinctive variations should be segregated and described. For the class of pipes with a long base projection beyond the bowl and in the same line and of about the same length as the stem, he proposed the term "equal arm." This same term was given by Deuel (1935: 435, and Fig. 5, No. 9) to the elbow pipe

form usually made of clay which he called a "determinant" of the Mississippi Culture. For the "equal arm" pipe of Deuel, Baerreis uses the term "elbow" pipe. The "T-shape" term he applies only to a form with a short stem about equal to a basal projection beyond the bowl. This section of Baerreis' paper provided a bit heavy going because of the changes in terminology and the necessity of checking the literature in order to have an understanding of the grouping he had in mind.

The pipe forms selected by him as representative of the Spiro Ceremonial Complex were the equal arm and T-shape forms as defined by Baerreis, the stone pipe with short stem projection, and the human and animal effigy forms. There can be no question that these forms are associated with ceremonial activities in the major Spiro sites. Such common pipe forms as the pottery elbow form and the long distinctive tubular stem and small bowl set near the end of the tube are eliminated from consideration on the curious ground that "they are frequently encountered in ordinary village refuse which may perhaps imply that they had a more secular than ceremonial function." This decision was made even though one of the latter forms was with burials at Gahagan, was found at the Davis site, and with burials at Mineral Springs, Haley, Norman, and other important Caddoan sites. Why could these forms not have had different functions at different times?

The effigy pipes at Spiro and at Norman are compared to those at Gahagan, and Baerreis suggests that the "Caddoan" effigy pipes are a part of the Spiro Ceremonial Complex. He also recognized that some effigy pipes were a part of the Southern Cult, "particularly the bird form," but believes that they were incorporated into it at a later time than the effigy pipes which are at Spiro and Gahagan. In my discussion of the Spiro pipe complex (Griffin, 1952: 90-92) it was argued that the effigy pipes of Spiro and Gahagan were styles which were clearly Middle Mississippi, in form and in their distribution, and that there was no reason to attribute temporal priority for them at Spiro or in the Caddoan area.

The "cloud-blower" pipe at Gahagan (Moore, 1912: 514-519) is, I think, very clearly a Middle Mississippi form in its sculpturing and features. From Moore's photograph I suggest that the small light spots may be shell tempering in this pottery effigy pipe. After I had written the previous sentence, I asked F. J. Dockstader in New York to check this pipe and see if it were not shell tempered. His reply on March 4, 1961, says:

In answer to your request for information concerning our clay effigy pipe (17/479) from the Gahagan Site in Louisiana, I have examined this

specimen and in my opinion the tempering is very finely ground shell, the clay is the usual light brown material with indications of firing, the particles of shell are quite small and the whole texture of the material compares quite favorably with most of our Louisiana pottery. There do not seem to be, numerically, as many shell particles in the composition of this particular specimen as are found in many of the Louisiana-Alabama-Mississippi pieces, but it is not unique in this respect since we also have many which contain a low percentage of shell in the clay. There are no large particles of the sort found commonly in large vessels, nor are they as profuse as, for example, some of those in the material from the Crable Site. I mention this latter only because I happened to have some of these on the table at the same time I was examining the C. B. Moore piece and know you also have a goodly amount of it.

The frog and human effigy pipes at Gahagan are forms which are well known in Mississippi period sites to the north and east. The best human effigy pipes similar to the superb group from the Craig Mound are from the Pittsburgh Landing (Shiloh Battlefield) site in western Tennessee, and from Moundville (West, 1934: Pl. III), which seems to have a connection with the Southern Cult. A pipe of the same character is illustrated by Thruston (1890: 188) from near Kingston, Tennessee, and he also reports a similar pipe from the Oldtown area along the Harpeth River in central Tennessee.

Williams and Goggin (1956) have discussed the "Big Boy" pipe from Spiro and pointed out the human face ear plug on both sides of the head as a representation of the Long Nosed God. This is probably true, but the sculptured form on the pipe is closer to the small shell replicas than it is to the specific copper effigy forms with their striking nose projection. They have employed "The Long Nosed God" as a horizon marker indicating a short time spread, but we cannot be certain that this is the case. For example, I am sceptical of their assignment of the shell replicas to the same period as the copper forms at Aztalan. Now it should be noted that "Big Boy" wears a disc-like hair ornament over his forehead that bears an "ogee" symbol, so intimately associated with the Southern Cult that Waring and Holder suggested it was an anus symbol. Attention might also be directed toward the magnificent human effigy pipe from Muskogee County, Oklahoma, which was formerly in the Whelpley Collection and is now housed in the St. Louis Art Museum (Fundaburk and Foreman, 1957: Pl. 95-96). This figure is in the act of participating in a chunkee game and holds a fine discoidal stone of the biconcave type in his right hand. As a result of these observations on the effigy pipes at Spiro, I reach the conclusion

that so far as we can tell at present the pipes are on the same general time level as many expressions of the Southern Cult and that "Big Boy" is probably not on the same time level as the copper Long Nosed God masks.

There must be a temporal sequence of pipe forms in the Caddoan area, and one of the early forms of the Mississippi period should be the long tubular stem forms with the small bowl set at, or near, one end of the tube; some varieties of Baerreis' T-shaped form and other varieties of the projecting stem; and perhaps some of the elbow form. All of these may be viewed as developments from the platform pipe of Hopewell time, with regional styles appearing in the Caddoan area. They are local expressions of the general shift to the elbow form which took place all over the eastern area in post-Hopewell time. With due reserve it is proposed that the effigy complex associated with pipe smoking in Hopewell times evolved through the large steatite and other stone forms of the Kentucky-Tennessee area into the effigy complex of the Mississippian cultures.

Summary

My purpose at the Caddoan symposium was to suggest that the developed Caddoan ceremonial complex, in so far as it could be recognized as a complex, was on the same general time level as much of the Southern Cult. We do not yet have the skill and the techniques to recognize and clearly differentiate the growing complexity of the ceremonial life of the Southeastern agricultural communities. The artifact styles certainly evolve through time and we will eventually be able to see segments of the Mississippian culture development and thus the growth and decline of its ceremonial expression. It is difficult now to pin-point those traits which are early and those which are clearly late. Some efforts have been made in that direction. None of them, however, leads me to the conclusion that the known Spiro Ceremonial Complex is earlier than the Southern Cult, or as A. J. Waring, Jr., M.D., prefers to call it, the Southeastern Ceremonial Complex. I well remember that at the close of my talk at the symposium that Dr. Alex Krieger remarked to the audience, "Griffin has proved his point."

References Cited

Baerreis, David A.

1954. The Huffaker Site, Delaware County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society*, Vol. II, pp. 35-48.
1957. The Southern Cult and the Spiro Ceremonial Complex. *Bulletin of the Oklahoma Anthropological Society*, Vol. V, pp. 23-28.

Bareis, Charles John

1955. The Brackett Site, Ck-43, of Cherokee County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society*, Vol. III, pp. 1-52.

Bell, Robert E.

1953. Pottery Vessels from the Spiro Mound, Cr-1, Le Flore County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society*, Vol. I, pp. 25-38.

Bell, Robert E., and David A. Baerreis

1951. A Survey of Oklahoma Archaeology. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 22, pp. 7-100.

Burnett, E. K.

1945. The Spiro Mound Collection in the Museum. *Contributions from the Museum of the American Indian, Heye Foundation*, Vol. XIV.

Crane, H. R.

1956. University of Michigan Radiocarbon Dates I. *Science*, Vol. 124, No. 3224, pp. 664-672.

Crane, H. R., and James B. Griffin

1959. University of Michigan Radiocarbon Dates IV. *American Journal of Science Radiocarbon Supplement*, Vol. I, pp. 173-198.

Deuel, T.

1935. Basic Cultures of the Mississippi Valley. *American Anthropologist*, Vol. 37, No. 3, Pt. 1, pp. 429-445.

Finkelstein, J. Joe

1940. The Norman Site Excavations near Wagoner, Oklahoma. *The Oklahoma Prehistorian*, Vol. III, No. 3, pp. 2-15.

Ford, James A., and Gordon R. Willey

1941. An Interpretation of the Prehistory of the Eastern United States. *American Anthropologist*, Vol. 43, No. 3, pp. 325-363.

Fundaburk, E. L., and M. D. Foreman

1947. *Sun Circles and Human Hands*. Luverne, Alabama.

Griffin, James B.

1946. Culture Change and Continuity in Eastern United States Archaeology. *Papers of the Robert S. Peabody Foundation for Archaeology*, Vol. III, pp. 37-95.

1952. An Interpretation of the Place of Spiro in Southeastern Archaeology. In: Hamilton, 1952, pp. 89-106.

1960. A Hypothesis for the Prehistory of the Winnebago. In: Stanley Diamond (editor), *Culture in History: Essays in Honor of Paul Radin*, pp. 809-868. Columbia University Press.

Hamilton, Henry W.

1952. The Spiro Mound. *The Missouri Archaeologist*, Vol. 14 (whole volume).

Moore, C. B.

1912. Some Aboriginal Sites on Red River. *Journal of the Academy of Natural Sciences of Philadelphia, Second Series*, Vol. XIV, Part 4.

Moorehead, W. K.

1929. The Cahokia Mounds. *University of Illinois Bulletin*, Vol. XXVI, No. 4.

Newell, H. Perry, and Alex D. Krieger

1949. The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology*, No. 5.

- Phillips, P., James A. Ford, and James B. Griffin.
1951. Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940-47. Papers of the Peabody Museum of American Archaeology and Ethnology, Vol. XXV.
- Shaeffer, James B.
1957. The Nagle Site, Ok-4. Bulletin of the Oklahoma Anthropological Society, Vol. V, pp. 93-99.
- Thruston, Gates P.
1890. Antiquities of Tennessee, and Adjacent States. Cincinnati.
- West, George A.
1934. Tobacco Pipes and Smoking Customs of the American Indians. Bulletin of the Public Museum of the City of Milwaukee, Vol. XVII, Pts. 1 and 2.
- Williams, Stephen, and John M. Goggin
1956. The Long Nosed God Mask in Eastern United States. The Missouri Archaeologist, Vol. 18, No. 3, pp. 1-72.

University of Michigan
Ann Arbor, Michigan

Discussion

By Philip Phillips

At the time of the Symposium I felt that Griffin had certainly made his point. After re-reading his and Baerreis' paper I still think so, but I must admit that the questions involved are a little complicated. The artifact types designated by Baerreis as possibly reflecting an early "Spiro Ceremonial Complex" show considerable internal development, presumably involving a fair amount of time. Until the details of such development are more clearly understood, any conclusions as to whether there is a Spiro Ceremonial Complex (as distinct from the Southern Cult), as well as its temporal relationships to the Cult, will remain hypothetical, which Baerreis himself admits. The exact nature of the Southern Cult and the temporal relationships between the various cult centers in the Southeast are equally nebulous. As Griffin points out, here also there is considerable development and time depth. Kneberg's (1959) recent study of engraved shell gorgets of the Dallas culture is an example of the kind of analysis all so-called Southern Cult artifacts must be given before we can begin to talk about Cult relationships with any confidence. It has long been my opinion that if and when such studies are completed the idea of a closely knit and rapidly disseminated complex will have undergone drastic modification and that the word "Cult" will disappear from the literature.

If we are not ready for a final showdown on the question of the specific relationships of Spiro to other Cult centers in the Southeast, nevertheless a good deal can be said about Spiro in the general context

of chronological relationships between the Caddoan and Lower Mississippi areas. My remarks at the Symposium attempted to summarize in the briefest possible way these relationships as they appear from that portion of the Lower Mississippi that I know most about. I have taken the liberty of deleting some of the most palpable errors and have altered the chronological estimates in line with recent radiocarbon dates.

Cultural sequences in the alluvial valley of the Lower Mississippi begin with the Poverty Point culture, a number of regional phases of which have now been dated. These range from about 1500 to 500 B.C. Except for the Calion site on the Ouachita River in Southern Arkansas, this culture does not seem to have penetrated the Caddoan area, where at this time there was a relatively undifferentiated late Archaic culture without Poverty Point elaborations. Towards the end of the period fiber-tempered pottery appeared in the Lower Mississippi, but so far we have not found any pure components that would lend a name to a fiber-tempered phase.

In the succeeding Tchefuncte culture there seem to have been attenuated connections in coastal Texas and possibly here and there in the Caddoan area. Various speakers at the Fifth Conference on Caddoan Archeology have referred to sand-tempered pottery in an otherwise East Texas Archaic context that might be related to the sand-tempered assemblages that have been described as associated with the predominantly clay-tempered Tchefuncte and Tchula complexes of Louisiana and Mississippi.

About the time of Christ, perhaps a little earlier, we find the Marksville culture well established in the lower valley. There are almost certainly undiscovered earlier phases. In a site on the lower Sunflower River in Mississippi, Greengo found sherds closely related to the Havana ware of Illinois Hopewell, almost certainly older than the classic Marksville pottery from Louisiana. In the later phases of this culture, Troyville in Louisiana, Issaquena in Mississippi, we get the first signs of contact with the Caddoan area. The sherds illustrated by Krieger (Newell and Krieger, 1949: Fig. 50) as evidence of contact between the Davis site and Marksville, in my opinion, based only on inspection of the illustrations, bear no such interpretation. Only one sherd out of the lot (Fig. 50, Q) looks as though it might have come from the Lower Mississippi, and this I believe is Troyville. This sherd, from the primary mound fill, hence Davis 1 or earlier, just about bears the whole weight of the Davis-Marksville equation, upon which in turn rests a good deal of Krieger's contention that the Spiro florescence

was in Troyville times. In the main, penetration of Marksville-Troyville pottery into the Caddoan area does not seem to have gone very far—up the Red River to the Shreveport region (Bellevue phase) and up the Ouachita to the vicinity of Arkadelphia (Kirkham and Cooper sites). In this period the Caddoan area seems to be in a peripheral situation vis-a-vis the Lower Mississippi, and the Caddoan culture has not yet been formed.

Beginning with the onset of the Coles Creek-Plaquemine culture (we badly need a name to express this continuity), about A.D. 500, the picture changes. By this time the Weeden Island and Caddoan cultures must also have been developing in their respective areas and there are signs of contact along an east-west Gulf coastal axis. There was a considerable thrust of Coles Creek influence into the Caddoan area, and possibly actual phases of Coles Creek culture in Crenshaw I and Webb's "Red River Alto" sites. In the earlier part of this long continuity, i.e., the part represented by specifically Coles Creek phases (Williams has been able to distinguish three successive Coles Creek phases in the Lake George site dating from about A.D. 500 to 1000), the direction of influence still seems to have been from east to west. In the later Coles Creek-Plaquemine phases, i.e., those represented by the Plaquemine end of the continuum, there seems to have been, for the first time perhaps, a real interchange between the two areas. Perhaps we should say a three-way interchange, because the developing Mississippi culture, especially in its spectacular Cahokia phase, played an important role. This was the time of big ceremonial centers, of an influx (though not the first) of Middle American elements, the time of great emphasis on polished pottery, engraving, excising, bottle and carinated bowls forms, etc., a most exciting moment in the Lower Mississippi and Caddoan areas.

At the very end of the long Coles Creek-Plaquemine period, exemplified by the Mayersville phase in the Lower Yazoo and by Cotter's Plaquemine components in the great Natchezan sites, the first evidences of the Southern Cult appear. Williams has Mayersville at the Lake George site fairly well dated at A.D. 1200 to 1400. This, in my opinion, is the time of the most intense developments at Spiro. It was followed, in the Lower Yazoo sequence by the first fully developed Mississippi phase (Lake George), and farther south by the Natchezan, in which, it seems to me, the element of continuity from Coles Creek-Plaquemine was stronger than the impact of Mississippi culture. In this respect the late Caddoan cultures were more like Natchezan. They were never swamped by Mississippi.

It is this last point that I would emphasize in closing. I was rather surprised at the Symposium to hear Caddoan culture so often described as Mississippi. Perhaps this is nothing more than deference to a revered but no longer viable system of classification. If I were laboring in the Caddoan vineyard, I would stress the individuality of Caddoan culture, its independence of, not to say resistance to, the spread of Mississippi culture.

If my remarks have contributed to Griffin's assault on the priority of Spiro over eastern centers of the Southern Cult, they are in no sense a disparagement of the essential integrity of Spiro as one of the most intense and fascinating cultures of the eastern United States.

REFERENCES CITED

Kneberg, Madeline

1959. Engraved Shell Gorgets and Their Associations. *Tennessee Archaeologist*, Vol. 15, No. 1, pp. 1-39.

Newell, H. Perry, and Alex D. Krieger

1949. The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology*, No. 5.

Harvard University
Cambridge, Massachusetts

By Stephen Williams

I shall take this opportunity to clarify some of my comments made following Griffin's presentation at the Symposium and to add certain data and new ideas which Griffin's revised article and recent developments have elicited.

Griffin certainly has presented a lot of strong evidence for the relatively late date of most of the ceremonial material at Spiro and related Caddoan sites. I find myself in complete agreement with most of his statements on dating, and surely the time is soon coming (if it is not already here) when absolute dating throughout the Southeast will make any further discussion of Hopewellian (*circa* 300 B.C.-A.D. 200) connections with Spiro, Craig Mound (*circa* A.D. 1100-1300), as obsolete as Mr. Moorehead's six-inch soil auger.

With regard to the "Long Nosed God," I agree with Griffin in his suggestion that the representation on the "Big Boy" pipe is more like the small shell forms. I also accept his suggestion that there *may* be a time differential in the classic form of Long Nosed God representation which was somewhat lost sight of in our article (Williams and Goggin, 1956), although the temporal position of the later expressions of a long-nosed being, as on the *Walls Engraved* vessel (Fig. 18, B), was

clearly stated. However, all the copper forms (Big Mound, Gahagan, Aztalan, Grant Mound) are certainly similar enough to suggest an horizon marker of rather short temporal dimension. I understand that another pair of these copper masks has recently been excavated in Oklahoma (William H. Sears, personal communication), but I am not certain of their cultural association. As was noted (Williams and Goggin, 1956: 37), some of the small shell Long Nosed God masks are surely later and may be ancestral to the large shell mask gorgets dated by Kneberg (1959) after A.D. 1350. Further evidence for a late date for the short-nosed form has recently been presented by Griffin and Morse (1961).

Gregory Perino has recently excavated another pair of small shell Long Nosed God masks from the Cahokia region in what is presumably an Old Village context, and this evidence tends to strengthen the temporal placement of the Big Mound specimen (Williams and Goggin, 1956: Table 3).

In the volume cited above (*ibid.*: 62), three alternative chronological interpretations were offered:

(1) The Long Nosed God masks and associated traits temporally precede the inception of the Mississippian culture and its attendant but slightly later Southern Cult.

(2) The Long Nosed God masks date from an Early Mississippi period and precede the full development of the Cult.

(3) The masks are on a mature Mississippi time horizon during a period of developed Southern Cult symbolism, but occur in areas not strongly affected by the Cult, and as such are just a counterpart to the better known Cult symbols at the major centers.

Five years later the senior author is still of the opinion that No. 2 is the best, but I feel even more strongly that No. 1 is impossible. A full exposition and analysis of the third interpretation still awaits detailed chronological studies in the Caddoan area and at Cahokia.

Some eleven radiocarbon dates recently obtained from the Lake George site, Yazoo County, Mississippi, make it evident that the Classic Southern Cult connections, which seem to be on a Plaquemine level in the Lower Valley, must date well after A.D. 1000 and most probably at A.D. 1300 \pm 100. A temple structure atop Mound A contained a vessel with a late Cult rattlesnake design (A. J. Waring identification) and dated very close to A.D. 1500.

With regard to chronology, it must be remembered that the major sites usually discussed in relation to the "Southeastern Ceremonial

Complex" (Cahokia, Spiro, Moundville, and Etowah) are all large villages with a considerable time span. Radiocarbon dates at Lake George show nearly a thousand years of occupation; and certainly Cahokia, with its various ceramic components, must encompass as much or more time. The sherd counts from Moundville (Wimberly, 1956) indicate a long occupation of varying intensity, and Etowah has shown appreciable time depth too, although Mound C is evidently quite homogeneous and relatively late. Spiro is acknowledged to have some time depth whether one accepts Orr's three-part division of the material or not.

My point is that while it is too easy to think of all these sites and their associated material as on a single narrow time horizon, and likewise too easy to wrench single undated items from these complex situations and fit them into a convenient scheme, nonetheless I do feel confident that certain horizon style phenomena can be used successfully. I would defend the copper Long Nosed God masks as belonging to this category, and I feel that certain "Classic Cult" items in copper, such as the eagle warrior and related forms, are good time markers. However, because of the long time spans at the sites in question, I am sure that some of the other items which we may be casually comparing in our trait lists may be as much as 500 years too early (boat stones?) or 200 years too late (decadent form of shell gorgets). This statement is but an expansion of Griffin's final point, but one which needs emphasizing.

In terms of space rather than time, the problem of Cahokia-Caddoan ties is vexing too. The recent discovery of Cahokia-like material in Arkansas by Gregory Perino, coupled with some *Ramey Incised* sherds from the Lake George site, gives evidence of northern influence coming rather directly down the Mississippi. The Red River connections in these cultural transmissions are at present rather unclear, but it seems apparent that they are not on the classic Coles Creek time horizon, A.D. 750 \pm 100. It is striking that engraving, such an important Caddoan trait, does not appear in the Lower Yazoo Basin until late Plaquemine times, *circa* A.D. 1300 \pm 100. There must have been a strong cultural barrier preventing the diffusion of this particular trait down the Red River, whereas highly polished plain pottery, often suggested as a correlative treatment, appears in late Coles Creek times, or even earlier.

Thus it appears that, although there remains a vast amount of detailed analysis and area synthesis to be done, certain broad limits can now be set on the problems involved.

REFERENCES CITED

- Griffin, James B., and Dan F. Morse
 1961. The Short-nosed God Form from the Emmons Site, Illinois. *American Antiquity*, Vol. 26, No. 4, pp. 560-563.
- Kneberg, Madeline
 1959. Engraved Shell Gorgets and Their Associations. *Tennessee Archaeologist*, Vol. 15, No. 1, pp. 1-39.
- Williams, Stephen, and John M. Goggin
 1956. The Long Nosed God Mask in Eastern United States. *The Missouri Archaeologist*, Vol. 18, No. 3, pp. 1-72.
- Wimberly, Steve B.
 1956. A Review of Moundville Pottery. *Southeastern Archaeological Conference Newsletter*, Vol. 5, No. 1, pp. 17-20.

Harvard University
 Cambridge, Massachusetts

By Alex D. Krieger¹

Yes, Griffin has proved the point that shell-tempered pottery may occasionally turn up in a grave with artifacts typical of Spiro Focus. The matter has been obscure, but I see no reason to question the validity of Griffin's careful documentation of grave vessels. The occurrence of shell-tempered *Woodward Plain* sherds in some of these sites (but not in graves) is, however, of questionable meaning in connection with Spiro Focus because these sites do give evidence of more than one occupation. The "cloud-blower" pipe from Gahagan may also be shell-tempered, but Dockstader's statement, quoted by Griffin, suggests caution in that the shell particles are said to be infrequent. In such cases—by no means rare—it may be difficult if not impossible to prove that such particles were intentionally added as a tempering agent. Otherwise, Griffin's observations do not change the generality that shell temper is completely absent or exceedingly rare in all Caddoan foci except some which date close to the appearance of European trade goods, or afterward, as in Fort Coffee, McCurtain, and Glendora.

At the outset, Griffin refers to his 1952 paper on the place of Spiro in Southeastern archeology. In it, as he says, he belabored certain views of Caddoan development "which Krieger favored at the time," and states that most students of the subject either failed to read it or were so disenchanted that they made no attempt to refute it. In the first place, this paper was largely devoted to showing that Spiro shares

¹ This paper is based on some of my reactions to Griffin's paper at the Symposium in Norman. At the editor's suggestion, I have reorganized and enlarged these comments to agree with Griffin's present paper, which also has been revised and brought up to date (March, 1961).

many more traits with Mississippian cultures than it does with Hopewellian, which no one has ever denied; and in the second place, it was intended to show the "impossibility" of the second of two alternative interpretations of the relationships between Gibson Aspect foci—including Spiro—and other Southeastern cultures which I presented in the Davis site monograph (Newell and Krieger, 1949: 219–224). The first and more orthodox alternative was not mentioned. If a defense were needed for my 1949 study, I can only say that alternative interpretations are desirable in any situation; and if one or more of them can be effectively disproved, no one has been hurt, and the disproving evidence (if such it is) is itself a contribution to knowledge. Anyone interested can read or re-read pages 223–224 of the Davis site monograph and decide whether the two alternatives were fairly stated. I think they were and that the second, decidedly unorthodox interpretation served a purpose in stimulating some thought on the subject.

In his 1952 study of Spiro and in the present paper, Griffin has neglected to account for a number of intriguing resemblances between Spiro and its close affiliates in the Caddoan area on the one hand, and Hopewell (or late Hopewell) on the other, such as burial customs, several kinds of copper artifacts, "napkin-ring" ear spoons, Copena "points" or knives, and the near-identity in facial expression as well as knobs (representing hair-dos?) on human effigy pipes from Spiro and on Hopewellian clay figurines. Although the ceramics of Spiro and Hopewell are, of course, totally different, many archeologists have recognized extensive carry-over of non-ceramic traits from Hopewell to Mississippian or Mississippian-connected cultures, which implies that the latter may have begun to germinate before Hopewell had disappeared or at any rate that there was no great time lapse between them. This situation was *specifically predicted* by Ford and Willey as long ago as 1940, when they said that

Intensive investigations in the central part of the Mississippi Valley will very probably show that the widespread Middle Mississippi cultures were developing at the same time, principally from Hopewellian. One result to be expected . . . is that traits directly comparable to those of Hopewellian will appear sporadically in peripheral Mississippian cultures and in the adjacent Woodland cultures . . .

This passage was quoted in Newell and Krieger (1949: 223) and I firmly believe it is valid today, not only in the interpretation of Spiro and other Gibson Aspect foci, but in various situations east of the Mississippi River, if we use the term "Mississippian cultures" in a

very broad sense—of which, more below. It is also borne out by radio-carbon datings, but here we are up against a very strange attitude among many eastern archeologists, who now accept the fact that Hopewell is dated by this method at about 400 B.C. to A.D. 100 or 200 (the ending date is by no means clear), but who fiercely contend that any datings older than A.D. 900 or even 1100 for Mississippian cultures (again using this term in the “old” or very broad sense) cannot possibly be valid. This dilemma may, perhaps, be escaped by restricting the term Mississippian to what has long been called “Middle Mississippian,” but this still leaves us with the question of what went on in the central parts of the eastern United States during the 800 or 1000 years between Hopewellian and “Middle Mississippian.” This dilemma has recently been pointed out by Caldwell (1958: 64) in respect to the Southern Cult horizon, which may be taken as coeval with “Middle Mississippian:”

Willey has recently pointed out that, in a general way, these incised designs on Santa Rosa pottery are reminiscent of Southern Cult motifs. The bird, the hand with symbol on or in it, and the sun are among the three most important features of Southern Cult symbolism. But Santa Rosa must belong to the first centuries A.D. while the cult is provisionally datable to more than 1000 years later.

Caldwell (1958: 58) also quotes Willey regarding a fourth element, i.e., that “the common Mississippian idea of effigy pottery forms occurred on the Florida Coast as early as Santa Rosa times . . .” To account for this supposed gap of 1000 years, Caldwell (1958: 59) advances the hypothesis that many basic “Mississippian” traits were already present in the Southeast at an earlier time as part of the “Gulf Tradition:”

Present opinion regarding the formation of Mississippian culture is that it arose in the central portion of the Valley sometime prior to 1000 A.D. To judge from the cultural mixture represented, it can be proposed that the Mississippian Tradition represents some kind of fusion of local elements of that area with other elements which had already appeared in the Gulf Tradition immediately southward (Willey and Phillips 1955). Temple mound and plaza, ceramic effigy vessels in animal, vegetable, and human forms, effigy rim adorned and painted vessels are all documented earlier in the Gulf Tradition, geographically between the Nuclear American area from which they are supposed to have been derived and the presumptive heartland of the Mississippian area of which they later became most characteristic. That Nuclear America was the ultimate source of these ideas seems reasonable, but we should also expect them to have

been in some degree modified by their residence in the Gulf Tradition before being reformulated as Mississippian.

Under the older conception of a generalized Mississippian Pattern or Culture we would have said that the basic traits of presumably Middle American or Nuclear American origin appeared at some time in the eastern United States, initiating this Pattern or Culture, and that "Middle Mississippian" developed out of it in the central sections of the Mississippi Valley. Now, if we follow Caldwell, these traits are said to appear first in the Southeast as part of the "Gulf Tradition," from where they moved into a "Mississippian Tradition" of much more limited scope—geographically and temporally—than the former Mississippian Pattern (or Culture). In other words, the cultural situation is about the same, but a different set of terms is used to describe it. Caldwell does not attempt a precise dating for the beginning of his "Mississippian Tradition," except to say that its formation began some time prior to A.D. 1000. He also thinks that the Southern Cult complex should date at A.D. 1200 or 1300. It is thus apparent from his own arguments that there are at least two cultural horizons or periods which bear the label of "Mississippian" in one way or another; one earlier than the Southern Cult, and a later one which has this Cult. A third might be added: Mississippian material extending into historic times, which either has no Southern Cult material or has only greatly attenuated expressions of it.

Returning to the Caddoan area, I can see no particular reason for Caldwell's placement of this entire block of archeological material in the Gulf Tradition rather than the Mississippian; if a choice had to be made, I would think the latter more logical. More important, we may ask whether or not the Caddoan block might also be subdivided into (A) a period preceding Southern Cult phenomena; (B) one with this Cult; and (C) one extending into historic times which either lacks Cult expressions or reveals them only in meager, attenuated form. It is my opinion that all the analysis of Caddoan archeological material to date *does* support three such subdivisions.

Griffin objects to Baerreis' analysis of the Spiro material into (A) a Spiro Ceremonial Complex which has certain "Mississippian" traits but not the specific elements of the Southern Cult; and (B) a Spiro Focus in which the Cult is a predominating feature. This subdivision is called "unsound and unsatisfactory" by Griffin, apparently on the grounds that some or most of the traits listed by Baerreis for the Spiro Ceremonial Complex can be found elsewhere in association with specific Cult traits.

This objection seems to me to be illogical. In the first place, Baerreis himself (1957: 34) was quite aware that the temporal isolation of the traits defining his "Spiro Ceremonial Complex" did not preclude their *also* occurring alongside of Cult traits after the Cult developed. Second, all students of this subject have realized the urgent need for a breakdown of post-Hopewellian archeological material, widely over the eastern United States, into traits which are of general occurrence in the "Mississippian" and "Gulf" traditions, and those which may be *specifically* assigned to a Southern Cult complex; and Baerreis is one of the few to attempt such a breakdown or finer distinction in a local situation. Third, Baerreis, like some other archeologists, was concerned with reconciling the presence or continuity of Hopewellian non-ceramic traits in a site like Spiro with a gap of some thousand years that is supposed to separate them. Fourth, there are other situations in the eastern United States which also point to at least two and probably three periods within the Mississippian and Gulf traditions after Hopewellian times. We have already mentioned Caldwell's thesis of 1958. Two years previously, Williams and Goggin (1956) made an exhaustive study of eastern United States prehistory in order to establish the temporal and cultural position of the Long Nosed God masks of copper and shell. They likewise arrived at the conclusion (see their Table 3) that there is evidence for two general periods, the first or earlier one containing the Long Nosed God masks but not the Southern Cult; and the later one containing the developed Cult. The two general periods were called "Early" and "Late" Mississippian. In this case, too, a third period could have been added, beginning well before historic times but extending into them, during which the Cult was absent or greatly attenuated. The "Spiro I" phase in Williams and Goggin's chart (Table 3) presumably corresponds with Baerreis' "Spiro Ceremonial Complex," preceding the "Spiro II" phase with its Southern Cult. Williams and Goggin (1956: 52-53) have also stated that

If the supposition that the Long Nosed God mask can act as a horizon marker is accepted, then it becomes a cultural phenomenon *with equivalent temporal import* for the archeology of eastern North America as the classic bird design on pottery of the Hopewellian manifestation, or the fine repoussé copper plates showing the human figure in rich ceremonial paraphernalia, characteristic of the highest development of the Southern Cult . . . (*italics mine*).

If the Long Nosed God motif is, indeed, comparable to the bird designs of Hopewell in "temporal import," it may not be simply a "horizon marker," implying a very short duration, but a marker for

a cultural period which endured for some centuries. This is because the Long Nosed God masks constitute only one trait—a very readily recognized one—which is only a small part of the cultural assemblages in which they have been found.

At any rate, from the time perspectives gained for all eastern United States culture periods through radiocarbon dating, longer life-spans for the post-Hopewellian periods should no longer be surprising or combatted as unreasonable: we have only to reflect for a moment on the many confident statements made during the 1930's and 1940's about the age of eastern United States cultures, with the Archaic "dated" at 500 B.C. to A.D. 500 (or later), Hopewell "dated" at A.D. 1000 or 1200, and so on!

The radiocarbon datings on post-Hopewellian cultures are, of course, very confusing at present. I don't know what can be done about it except to obtain many more datings with all due attention to exact associations with specific cultural assemblages. Some of these datings appear to support the "short" versions of Mississippian chronology, like those cited by Griffin in his paper. Others, like the measurements reaching into the centuries before Christ at the Spiro site, are impossibly old. A few, obtained recently, may be more reasonable if only because they cluster around an intermediate position. In *Radiocarbon Supplement* (Vol. 2, 1960: 37-38) there are four datings from sites in eastern Oklahoma, determined by the University of Michigan laboratory, all on charcoal. These are:

- Sample M-816, Craig Mound at Spiro site: 1170 ± 150 years ago
- Sample M-817, Hughes site: 1050 ± 150 years ago
- Sample M-818, Norman site: 1050 ± 150 years ago
- Sample M-819, Reed site: 1100 ± 150 years ago

To these may be added an age determination of 1100 ± 100 years ago at Level IV of the Belcher Mound in northwestern Louisiana (letter from C. H. Webb dated November 27, 1959). Belcher Level IV has nothing to do with the much later Belcher Focus; it is a component of the Haley Focus, which Webb and I have long regarded as somewhat later in time than the classic Spiro Focus with its spectacular Southern Cult material. The four other dates just mentioned may or may not apply specifically to the time of Southern Cult florescence in eastern Oklahoma; the published reports on these sites place them in the Gibson Aspect but focal assignments present difficulties, and the date of 1100 ± 100 B.P. for the Haley component at Belcher possibly indicates that all five dates are relatively late in the Gibson

Aspect. The Spiro Ceremonial Complex of Baerreis may then be earlier than the span of about A.D. 790 ± 150 to 910 ± 150 for these five dates and thus closer to the end of Hopewellian times.

Radiocarbon dates as early as 960 ± 250 B.P. for the Trappist Focus and 910 ± 200 B.P. for a grave with cult objects at Etowah have also been obtained (*Radiocarbon Supplement*, Vol. 1, 1959, sample M-670 on page 181 and Sample M-542 on page 188). Younger dates have been obtained on the same cultural horizons, but I cite these two as examples of dates which are usually discarded in favor of younger ones.

So far in this critique I have not questioned the assumption of others that the Southern Cult was a single, rapidly-spreading ceremonial phenomenon of comparatively short duration in the prehistory of the Eastern United States. However, I have long doubted that this was true. A thorough analysis of the whole Southern Cult concept is long overdue, not only to separate it from more generalized "Mississippian" traits, but to define different "chapters" of this Cult, each of which would show emphasis on different kinds of symbolism even though a few elements might be common to all. This is not the time or place to attempt such a study, nor am I close enough to the material any more to attempt it myself. Williams and Goggin (1956: Table 2) have itemized scores of culture traits at nine important Mississippian sites, but aside from removal of the Long Nosed God motif from the Southern Cult and placing it in an earlier period, they made no attempt at a new and more precise definition of the Cult itself. Their trait list should, however, provide an excellent springboard for such a further analysis. My guess is that when more complete datings are available, significant time differences for Cult expressions will emerge in such widely separated areas as Oklahoma, the central Mississippi and lower Ohio valleys, Wisconsin, Georgia, Florida, Alabama, etc.

Returning for a moment to the matter of shell-tempered pottery, Griffin states that "it is assumed by most Mississippi Valley archeologists that shell tempering, as a characteristic of Mississippian cultures, originated somewhere between Memphis and St. Louis and spread out from there." He admits that this assumption "has not yet been proved;" it is probably based on the common belief that a trait must have originated in the area where it reached its greatest popularity: always a possibility, of course, but never to be taken for granted.

Griffin has apparently overlooked the paper by Proctor (1957) on the Sam Site in Le Flore County, Oklahoma, the first detailed report on a component of the Fourche Maline complex (or culture, or focus).

Orr (1952) considered Fourche Maline as most likely belonging to an Early Woodland period, less likely to Middle Woodland (using Griffin's terms). Krieger (1953) thought that it could only belong to the Middle Woodland. Its pottery suggests some prototypes for Spiro Focus but otherwise it is rather certainly pre-Caddoan. Proctor (1957: 59) states that "Shell-tempered pottery which has been considered a marker for the Fulton Aspect [in this area] appears in varying degrees at all of the known Fourche Maline sites without altering the basic trait list. At the Sam Site it occurs in the lowest pottery level and . . . is roughly contemporaneous with all of the other types found at the site." Proctor considers the alternative that shell temper may in itself make Fourche Maline as late as Fulton Aspect, but nothing else in the culture would support this position. If, then, as seems most likely, Fourche Maline was pre-Spiro, the shell-tempered vessels listed by Griffin in Spiro Focus context are not unexpected. Where, then, did the shell tempering idea originate: in "Middle Mississippi," in Fourche Maline, or in some other area which might be revealed by better chronological control?

In summary, I hope I have made it clear that Griffin's factual data on the place of occurrence of various Mississippian traits is not being questioned. I am, however, concerned with how this and other material is to be interpreted in terms of the whole structure of Mississippian culture. It is amazing that so little organizational progress has been made since the excellent Burial Mound-Temple Mound scheme of Ford and Willey in 1941. Griffin's final paragraph shows his complete awareness of the same problems when he states that "We do not yet have the skill and the techniques to recognize and clearly differentiate the growing complexity of the ceremonial life of the Southeastern agricultural communities. . . . It is difficult now to pin-point those traits which are early and those which are clearly late." I think, then, that we could do with fewer reassurances that so many relatively late traits simply "originated in Middle Mississippian," and concentrate more on a general overhauling of post-Hopewellian chronology.

REFERENCES CITED

- Baerreis, David A.
1957. The Southern Cult and the Spiro Ceremonial Complex. *Bulletin of the Oklahoma Anthropological Society*, Vol. 5, pp. 23-38.
- Caldwell, Joseph R.
1958. Trend and Tradition in the Prehistory of the Eastern United States. *Memoirs of the American Anthropological Association*, No. 88.

Ford, James A., and Gordon R. Willey

1940. Crooks Site, A Marksville Period Burial Mound in La Salle Parish, Louisiana. Louisiana Geological Survey, Anthropological Study No. 3.

1941. An Interpretation of the Prehistory of the Eastern United States. *American Anthropologist*, Vol. 43, No. 3, pp. 325-363.

Griffin, James B.

1952. An Interpretation of the Place of Spiro in Southeastern Prehistory. In: Henry W. Hamilton. *The Spiro Mound*. *The Missouri Archaeologist*, Vol. 14, pp. 89-106.

Krieger, Alex D.

1953. Review: Kenneth G. Orr, *Survey of Caddoan Area Archaeology*. *American Antiquity*, Vol. 19, No. 2, pp. 184-187.

Newell, H. Perry, and Alex D. Krieger

1949. The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology*, No. 5.

Orr, Kenneth G.

1952. *Survey of Caddoan Area Archaeology*. In: James B. Griffin (editor), *Archeology of Eastern United States*, pp. 239-255.

Proctor, Charles

1957. The Sam Site, Lf-28, of Le Flore County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society*, Vol. 5, pp. 45-91.

Williams, Stephen, and John M. Goggin

1956. The Long Nosed God Mask in Eastern United States. *The Missouri Archaeologist*, Vol. 18, No. 3, pp. 1-72.

209 Lake Washington Blvd.
Seattle 22, Washington

Relationships Between the Caddoan Area and the Plains¹

ROBERT E. BELL

It is my purpose to discuss the interrelationships between the Caddoan Area and the Plains, focusing attention primarily upon Oklahoma and the states to the north, leaving the Texas side of the story to my associates. Since Oklahoma lies in a strategic position, being partly within the Caddoan Area and partly within the Southern Plains, it is only natural that I should become interested in the relationships between these two areas. I would like to emphasize, however, that many of the ideas suggested here are speculations based upon occasional hints or on familiarity with the archeological materials. Nevertheless, I think it worth while, perhaps an obligation, to occasionally evaluate what has been done, and to reconstruct from available data something that may help in building an archeological history. Later, after additional research, such ideas can be evaluated and accepted, modified, or rejected. With this introduction, then, I would like to comment upon Plains-Caddoan Area relationships as I see them at this time.

In this discussion of the Caddoan Area I am referring essentially to the time periods represented by the Gibson and Fulton aspects. The Caddoan area is the territory formerly occupied by these peoples. Although earlier occupations are apparently represented in all parts of this region, they do not become recognizable units until Gibson times. Moreover, the areas occupied by the Gibson and Fulton groups do not remain static and are not always identical.

Within eastern Oklahoma there are two nuclear areas: one centering along the Arkansas River and its tributaries, such as the Canadian, Grand, Poteau, and Illinois in east-central Oklahoma, and another centering along the Red River valley and its tributaries in southeastern

¹ This paper was presented at a symposium entitled "Relationships between the Caddoan Area and Neighboring Areas," which was a part of the program of the 23rd Annual Meeting of the Society for American Archaeology, held at the University of Oklahoma, Norman, Oklahoma, May 1-3, 1958.

Oklahoma. The rough, wooded country of the Ouachita Mountains functioned as a natural divide between these two nuclear areas and was apparently a more sparsely occupied frontier region.

As one moves westward across Oklahoma, the common archeological materials represent a relatively late prehistoric occupation reflecting a typical Plains gardening and bison-hunting economy. The Washita River Focus (Bell and Baerreis, 1951), which is widespread in central Oklahoma, would be a typical example. Farther to the west, the Custer Focus (Bell and Baerreis, 1951; Brighton, 1951; Gallaher, 1951) is found in the area around Clinton, and the Optima Focus (Watson, 1950; Bell and Baerreis, 1951) is found in the Oklahoma Panhandle. All of these foci share a large number of traits and must be related to one another in some way. The Optima Focus, by virtue of its proximity to the Southwest, has a number of features, one of which is architecture, which must be ultimately derived from that region. As a result of these influences, the Optima materials are the most divergent.

If one examines materials from a continuous series of sites, however, starting with the Washita River Focus in central Oklahoma and continuing westward up the river valleys to the Custer and Optima areas, there is a gradual transition from one locality to the other. My impression is one of an expansion of peoples moving into the Plains area, originating in the east and following the main river valleys westward ultimately to occupy their respective areas of the state. Differences which occur throughout these areas are a reflection of borrowed ideas, local specializations, or a taxonomic failure to consider the transitional intervening areas.

The Washita River Focus is perhaps best known, and several sites have been described in the literature (Schmitt, 1950; Bell and Baerreis, 1951; Schmitt and Toldan, 1953; Oakes, 1953; Lawton, 1958). There are many other sites represented by test pit material or surface collections that have not been published on as yet. The area of distribution and depth of occupation in the sites suggest that some lapse of time is represented. Moreover, the occasional sherd, projectile point, or stone artifact representing the Gibson period suggests an origin from the east during late Gibson times. This eastern origin is further supported by the lack of older, possibly ancestral, occupations in the central Oklahoma area. Closely related manifestations in other localities are the Henrietta Focus along Red River in north-central Texas (Krieger, 1946) and the Great Bend Aspect along the Arkansas River in central Kansas (Wedel, 1947). These three cultural complexes are

closely related to one another and constitute a broad grouping of late prehistoric peoples that occupied the Southern Plains.

The cultural identification of the Washita River peoples remains to be proven by further study and excavation. I believe, however, that all present evidence points to an identification as prehistoric Wichita.

The Wichita are an example of the Caddoan stock who are now residents of Oklahoma, located primarily in the region around Anadarko. Their history is not well known, but Harper (1953a, 1953b, 1953c) has been able to trace their movements throughout the last 250 years.

In 1834 the main villages were located at the mouth of Devil's Canyon in southwestern Oklahoma (Harper, 1953c). Prior to this time, their villages were located in the area around Spanish Fort on Red River, and they are known to have occupied this area during the latter part of the 18th century, from 1757 to perhaps 1820 (Harper, 1953b). During the period prior to 1757, the Wichita were to be found along the Arkansas River in Kay County, Oklahoma (Harper, 1953a). Contact materials from these sites suggest an occupation for at least the period from 1700 to 1750 (Steen, 1953). Wedel (1947) has suggested identification of the Paint Creek culture (Great Bend Aspect) with Quivira, or the historic Wichita location for the period around 1540. Prior to this date we must rely upon archeological evidence.

For historic times our present evidence suggests that the Wichita were living in the Great Bend area of the Arkansas around 1540. Apparently they gradually moved eastward, down the Arkansas River, to be found living in what is now Kay County, Oklahoma, as early as 1700. As a result of shifting trade interests and Osage pressures, they moved from their Arkansas River location in 1757 to settle near Spanish Fort on Red River. Although remaining in this area for an indefinite period of time, they were located in southwestern Oklahoma by 1834. By 1859 these villages were abandoned, and the tribe moved into the Wichita Mountains area and ultimately settled on a reservation in the vicinity of Anadarko, Oklahoma. Thus during a period of over 400 years the Wichita are known to have occupied the southern Plains area from the Great Bend area of the Arkansas River in Kansas on the north to the Red River valley on the south.

The archeological materials indicate that the Paint Creek (Great Bend), Washita River, and Henrietta peoples are closely related. With the identification of Paint Creek as Wichita, it seems reasonable to identify the Washita River and Henrietta foci as prehistoric Wichita. I therefore suggest that in late prehistoric times there was a movement

of peoples westward out of the Caddoan area, following the main river valleys, such as Red, Washita, Canadian, and Arkansas. These peoples occupied the Plains area and became well adjusted to a Plains semi-hunting and semi-gardening economy, such as that represented by the archeological manifestations known as Henrietta, Washita River, and Paint Creek. In historic times these peoples were represented by the Wichita or associated bands.

As to when this population began its westward movement out onto the Plains, we need to look back at the Caddoan Area once again. The Gibson period is not characterized by traits which we think of as typically Plains. The features which are so typical of the Washita River Focus are generally lacking. Nevertheless, some familiarity with and knowledge of the Plains is manifest in flint specimens at Spiro and other sites which were derived from quarries considerably westward beyond the traditional limits of the Caddoan Area. On the other hand, during the Fulton period, there is a number of traits which reflect Plains culture—the diamond-shaped beveled flint knife, bison bones and artifacts made of bison bone, such as the scapula hoe, and storage pits. There are also similarities in projectile points and other artifact typology. In short, the southern Plains cultures (Washita River, Henrietta, and Paint Creek) share more features with the Fulton Aspect than with the Gibson Aspect. Yet the occasional Gibson trait, such as potsherds and specific projectile point types, suggest a late Gibson association for at least some part of this Plains assemblage.

Thus it appears that a critical time period for Caddoan Area relationships with the Plains is the transitional period from Gibson to Fulton times. This is, however, a poorly understood phase of Caddoan Area prehistory. Yet it is perfectly clear that during this transitional period something happens within the Caddoan Area that is not understood. Bell and Baerreis (1951), in their summary of Oklahoma archeology, comment as follows:

. . . features of the Gibson Aspect are in marked contrast to the Fulton Aspect, which follows it. While the marked superiority in some technological processes, particularly ceramics, continues and perhaps is even surpassed, in general the Fulton Aspect is marked by a decrease in cultural complexity. The discovery of the factors responsible for this decline, at least for this transition, constitutes one of the most interesting problems of the Caddoan Area. The Fulton Aspect appears to be marked by the decline in importance of the older ceremonial centers and the gradual disappearance of both burial and temple mounds, with the latter persisting for a longer period. As a positive contribution to this problem, it may be noted that in Oklahoma there is a marked shrinkage in the Caddoan Area

during the Fulton Aspect period. Such cultures as the Neosho focus of Upper Mississippi affiliation appear in the northeastern portion of the state taking the place of an earlier Gibson Aspect occupation. Complexes in the east-central portion of the state, such as the Fort Coffee, can no longer be regarded as "pure" Caddoan units but show strong influences from the Plains area. . . . It would appear that during Fulton Aspect times the Caddoan Area on its northern frontier had been subjected to increasing external pressure which resulted in both the decrease in actual size occupied and the dilution of the culture through the acceptance of many foreign innovations.

Orr (1952: 251) also comments upon this transitional period.

"The great change between Gibson and Fulton is especially due to the disappearance of the Gibson burial complex and associated ceremonialism. At the same time new elements begin to come in mainly from the Plains area: triangular projectile points, scapula hoes, L-shaped pipes, perhaps derived from some unit like the Great Bend Aspect of central Kansas. However sharp the changes from Gibson to Fulton, they can be explained as a rapid change of ceremonialism and the introduction of a relatively few new items rather than by wholesale cultural replacement.

Suhm, Krieger, and Jelks (1954: 171) consider the Haley Focus as representing a late Gibson period occupation perhaps evolving directly into Fulton times. They comment as follows:

Elsewhere in the Caddoan Area, the changes from Gibson to Fulton Aspect units are on the whole quite radical, indicating not only a break in continuity but perhaps a period of depopulation. Thus the continuities from one Aspect to the other appear to have been centered about the great bend of Red River in the Haley focus, and after a time of lapse in the surrounding areas, new influences emanated from this center, establishing the Fulton Aspect units in the four states.

I would suggest, then, that the southern Plains groups, such as the Henrietta, Washita River, and Great Bend manifestations, are pre-historic representatives of the Wichita group who split off from the main Caddoan stock toward the end of Gibson times. The movement of these peoples out onto the Plains at this time would not only be compatible with their appearance on the southern Plains but would help to explain the transition from Gibson to Fulton times within the Caddoan Area. These people were obliged to adjust to a new way of life on the Plains, thus sacrificing some of their earlier Gibson traditions but replacing them with a Plains way of life which had repercussions within the Caddoan Area homeland during Fulton times. Manifestations such as the Sanders Focus (Krieger, 1946) may well

represent an example of one such Gibson group moving out into the Plains and reflecting this transitional adjustment. Manifestations such as the Turkey Bluff Focus (Lehmer, 1952) may represent a later group with Fulton-Plains blending.

The reasons behind this movement out onto the Plains are not especially clear at this time, although one or two possible factors can be suggested. One of these would be the developing population pressures brought to bear upon the northern limits of the Caddoan Area in northeastern Oklahoma. Perhaps other groups to the east were impinging upon the Caddoan Area and forcing an expansion westward. Another factor, and one which I consider perhaps more important, is the possible role occupied by the bison. Throughout the Gibson period, bison bones are rare, often completely lacking, and obviously unimportant to the economy. On the other hand, during Fulton times or its equivalent, the bison becomes more plentiful and more important. It would seem quite possible that the bison was of primary importance in attracting these peoples onto the Plains. The abundance of bison to the west and increasing competition and population pressures in the homelands area could well stimulate such a movement westward.

The approximate date for this westward expansion out of the Caddoan Area is not clear. The dating of the Gibson and Fulton aspects remains unsettled and controversial at this time. Suhm, Krieger, and Jelks (1954) suggest a range for the Gibson period from around A.D. 500 to 1200; for the Fulton period from around A.D. 1200 into historic times, although most of the Fulton foci lacks historic materials. Utilizing only the youngest of conflicting radiocarbon dates for two Gibson sites in Oklahoma, a span from A.D. 1150 to 1350 is suggested. Possible dates for the Southern Plains cultures (Schmitt, 1950; Suhm *et al.*, 1954) range from A.D. 1300 to 1600. Thus the period around A.D. 1300 appears as a critical time, and I would suggest that the transition from Gibson to Fulton times, as well as the accompanying westward movement onto the Plains, took place sometime between A.D. 1200 and 1400.*

Not only did the Wichita move westward out of the Caddoan Area at this time, but I would also suggest that the related Caddoan tribes, such as the Pawnee and Arikara, are derived from this locality. These

* We now have one radiocarbon date available from a house post at the Lacy site, which is an example of the Washita River Focus. This date of 800 ± 150 (Specimen M-820, Michigan Memorial Phoenix Project Radiocarbon Laboratory, University of Michigan), giving a range from A.D. 1009 to 1309, suggests that my estimates given above are perhaps a century too late (R. E. Bell, Feb. 1, 1961).

later groups were derived from the Caddoan nuclear area centering along the Arkansas River in eastern Oklahoma toward the end of Gibson times, roughly between A.D. 1200 and 1400.

As a summary working hypothesis. I would suggest that the Gibson Aspect within the Caddoan Area was terminated by a movement of Gibson peoples out onto the Plains, where they later became identified as the historic Wichita, Pawnee, and Arikara. This westward movement probably took place sometime between A.D. 1200 and 1400. The Pawnee and Arikara moved westward and northward ultimately to occupy the Central and Northern Plains, whereas the Wichita remained in the Southern Plains. This latter group maintained contact with the Caddo groups remaining in the homeland, and these peoples were responsible for the Fulton Aspect, which is prehistoric Caddo proper. Differences which exist between the Pawnee and Arikara in the Central and Northern Plains and the Wichita in the Southern Plains may in part be a reflection of different sources from within the Caddoan Area, the Pawnee-Arikara being derived from the nuclear area centering along the Arkansas River in eastern Oklahoma, and the Wichita being derived from the Red River valley in southeastern Oklahoma.

References Cited

- Bell, Robert E., and David A. Baerreis
 1951. A Survey of Oklahoma Archaeology. Bulletin of the Texas Archaeological and Paleontological Society, Vol. 22, pp. 7-100.
- Brighton, Harold D.
 1951. Archaeological Sites in Custer County, Oklahoma. Bulletin of the Texas Archaeological and Paleontological Society, Vol. 22, pp. 164-187.
- Gallaher, Art
 1951. The Goodman I Site, Custer County, Oklahoma. Bulletin of the Texas Archeological and Paleontological Society, Vol. 22, pp. 187-216.
- Harper, Elizabeth Ann
 1953a. The Taovayas Indians in Frontier Trade and Diplomacy, 1719 to 1768. The Chronicles of Oklahoma, Vol. 31, No. 3, pp. 268-289.
 1953b. The Taovayas Indians in Frontier Trade and Diplomacy, 1769-1779. The Southwestern Historical Quarterly, Vol. 57, No. 2, pp. 181-291.
 1953c. The Taovayas Indians in Frontier Trade and Diplomacy, 1779-1835. Panhandle-Plains Historical Review, Vol. 23, pp. 1-32.
- Krieger, Alex D.
 1946. Culture Complexes and Chronology in Northern Texas. The University of Texas Publications, No. 4640.
- Lawton, Sherman P.
 1958. The Max Thomas Site, Gd-4. Bulletin of the Oklahoma Anthropological Society, Vol. VI, pp. 83-88.

Lehmer, Donald J.

1952. The Turkey Bluff Focus of the Fulton Aspect. *American Antiquity*, Vol. 17, No. 4, pp. 313-318.

Oakes, John Underhill

1953. The Lacy Site, Garvin County, Oklahoma. *Bulletin of the Oklahoma Anthropological Society*, Vol. I, pp. 17-24.

Orr, Kenneth G.

1952. Survey of Caddoan Area Archaeology. In James B. Griffin (editor), *Archaeology of Eastern United States*, pp. 239-255.

Schmitt, Karl

1950. The Lee Site, Gv-3, of Garvin County, Oklahoma. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 21, pp. 69-89.

Schmitt, Karl, and Raymond Toldan

1953. The Brown Site, Gd-1, Grady County, Oklahoma. *Bulletin of the Texas Archeological Society*, Vol. 24, pp. 141-176.

Steen, Charlie R.

1953. Two Early Historic Sites on the Southern Plains. *Bulletin of the Texas Archeological Society*, Vol. 24, pp. 177-188.

Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks

1954. An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 25.

Watson, Virginia D.

1950. The Optima Focus of the Panhandle Aspect: Description and Analysis. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 21, pp. 7-68.

Wedel, Waldo R.

1947. Cultural Chronology in the Central Great Plains. *American Antiquity*, Vol. 12, No. 3, pp. 148-156.

University of Oklahoma
Norman, Oklahoma
May 1, 1958

Discussion

By David A. Baerreis

Robert E. Bell's stimulating paper provides us with a broad interpretation of southern Plains history which in part differs sharply with other studies of this area that rank among our early major contributions. Basically we are presented with a picture of steady movement westward of Caddoan peoples, derived from a Gibson Aspect horizon, and gradually modified in this western habitat. This split from the main Gibson stock is postulated as taking place at the end of Gibson times and culminating in the historic Wichita, Pawnee, and Arikara. Among the representatives of this group, as prehistoric Wichita, is the Henrietta Focus described by Alex D. Krieger in his 1946 monograph,

Culture Complexes and Chronology in Northern Texas. Krieger, however, states (and in italics in his report) that “. . . there is very little in common between the Plains-like Henrietta Focus and the cultures of the ‘Caddo area’ to the east” (p. 156). He further denies flatly archaeological support for the obvious linguistic linkage between these tribal groups in stating:

From archaeological studies, at least, there appears to be practically no support for a contention that Pawnee material culture can be traced to “the old Caddoan habitat” to the south or southeast. I cannot recall a single Pawnee trait which may be said to point specifically in this direction (p. 158).

We are perhaps dealing with a somewhat oversimplified position in both instances. A major gap in Caddoan research lies in the question of the origin of the complex and elaborate Gibson Aspect materials. What was the nature of the ancestral or formative culture from which it developed? Is there a basic complex which spread over this region from which both the eastern and western variants developed, and could this earlier, and probably simpler, complex have been the source of the more northerly Wichita, Pawnee, and Arikara prior to their assimilation of local Plains strains?

The University of Wisconsin
Madison, Wisconsin

By Marvin F. Kivett

As a non-Caddoan worker, I believe Dr. Bell's paper offers a possible solution to certain Central Plains problems. The paper also poses certain problems.

Workers in a particular area, failing to find a solution to their problems in their immediate region, tend to look to other areas for that solution. In Nebraska this was a satisfactory arrangement so long as field work lagged in nearby areas. However, with the acceleration of research in these adjoining areas during the past ten years, we no longer have totally unknown areas to which we can attribute our unsolved problems.

Strong in 1935 expressed his opinion that the Upper Republican culture, as known in Nebraska, probably represented a prehistoric stage in Pawnee development. He also regarded the materials designated as Lower Loup Focus as proto-historic Pawnee. The Nebraska Culture, with a geographical distribution largely limited to the eastern third of Nebraska, was regarded as contemporaneous with the

Upper Republican complex, with each definitely influencing the other. Strong also suggested relationships for the rectangular earthlodge with the prehistoric Caddoan culture of southwestern Arkansas.

Despite the relatively large amount of field research in the Central Plains since 1935, I believe that most workers in the area will agree that the picture has not greatly changed. The Nebraska area has not produced direct evidence of cultural continuity between the Upper Republican complex and the Lower Loup. It now seems somewhat more likely that this sequence can be demonstrated from sites like the Arzberger (Spaulding, 1956) from the Missouri River Valley of South Dakota. Sites to carry the Lower Loup complex into the historic Pawnee period may also be lacking in the Nebraska area. It is difficult to extend our Lower Loup sites much beyond 1700. On the other hand, sites of the historic Pawnee variety are not known to date before about 1775.

This, of course, does not mean the rejection of Bell's working hypothesis that the Gibson Aspect within the Caddoan area was terminated by a movement of Gibson peoples out onto the Plains, where they later became identified as the historic Wichita, Pawnee, and Arikara. Dr. Bell's suggested date for this movement of A.D. 1200 to 1400 does not seem entirely out of line. However, it seems that some movements into the Nebraska area may have taken place at an earlier period. Perhaps the Nebraska Culture and even the Over Focus of South Dakota should not be removed from consideration in this picture. In any event, it seems likely that a series of Caddoan area influences over a considerable period of time may have occurred in the Central Plains area.

REFERENCES CITED

Strong, W. D.

1935. An Introduction to Nebraska Archeology. Smithsonian Miscellaneous Collections, Vol. 93, No. 10.

Spaulding, Albert C.

1956. The Arzberger Site, Hughes County, South Dakota. Museum of Anthropology, University of Michigan, Occasional Contributions, No. 16.

Nebraska State Historical Society
Lincoln, Nebraska

By Robert L. Stephenson*

Dr. Bell has presented a plausible, simple hypothesis that well accounts for many of the known facts of Plains-Caddoan relationships. It is not the only hypothesis possible here, but it has some real advantages to recommend it. Not the least of these advantages is its simplic-

* Submitted with the permission of the Secretary of the Smithsonian Institution.

ity. Some may say it is too simple. I incline toward a simple explanation of cultural phenomena, though, whenever possible, and especially as a basic framework upon which to build. Another advantage is the flexibility within this hypothesis, making it readily adaptable to cultural movements in several directions at the same, or at varying, time periods.

Certainly something dramatic took place in the Caddoan area around the end of Gibson Aspect times, roughly in the period of A.D. 1100–1300. A shift of *some* of the bands or other socio-political units of Caddoans away from the homeland and into the Plains seems a reasonable explanation. It accounts for a partial depopulation of the Caddoan area and provides an origin in both time and space for the Caddoan speakers in the Plains after that time. It may also account for the decline in ceremonialism at the end of Gibson Aspect times.

Assuming that this hypothesis is substantially correct, we would seem to have Caddoan groups of three kinds to consider. (1) There would be the groups of major size and importance that moved out into the Plains, shifting about as Bell has indicated and eventually becoming completely Plains people. One of these major groups (or possibly more than one) became the Henrietta-Washita-Great Bend-Wichita peoples that Bell traces rather clearly. Another group (or groups) became the Lower Loup-Pawnee-Arikara peoples who moved farthest from the Caddoan homeland, into the central, and later, the northern Plains. (2) There would be the groups of minor size and importance that participated to a lesser extent in the Gibson Aspect break-up, stayed near the Caddoan homeland, and remained more Caddoan than Plains oriented. One of these minor groups became the Turkey Buff Focus, another became the Sanders Focus, still another the Wylie Focus, the latter (Wylie Focus) having some sort of intimate connection with the larger group that became the Henrietta Focus, as is suggested by Wylie Focus pottery. (3) There would also be the groups that remained in the Caddoan area and ultimately became the Fulton Aspect peoples. These latter would, of course, account for by far the majority of Caddoan peoples. Such shifting about and realignments would bring the Caddoan culture area into closer contact with the Plains culture area and help to account for the Plains traits noted in the Fulton Aspect Caddoan sites.

These cultural shifts may have taken place rather suddenly, even explosively. If, however, any considerable time elapsed between the earliest migrations and the latest, I should suggest that the Lower Loup-Pawnee-Arikara group would have been the earliest to move.

I would base this suggestion on an age-area concept and on the need for a maximum span of time for Middle Missouri cultural units (La-Roche, Fort Thompson, Stanley) to develop.

Bell suggests some possible reasons why some of these Caddoan groups left home to become Plainsmen. I don't feel that these are very strong reasons. Who would be the "other groups to the east" that would be impinging on the Caddoan area, and what is the evidence? The importance of bison may be stronger, but there is some evidence that woodland bison may well have been available to the Gibson Aspect Caddoans without their having to go to the Plains for them.

Another reason may be suggested, and that is the elaborate Gibson Aspect ceremonialism itself. A highly developed religious complex may have been one of the major causes, rather than a result, of some of the groups moving away from the homeland and of the later de-emphasis of ceremonialism within the Fulton Aspect. Church fights are nothing unusual in either primitive or civilized societies. If in a primitive society the excessive rituals and ceremonies with their accompanying heavy demands upon the people had failed to get the expected results, or if the ceremonial leaders had become too domineering, a revolt may well have been instigated. This would take the form of splinter groups moving out of the homeland area, on the one hand, and disruption of the long-established way of life of the groups that did not move away, on the other. Some of the latter would tend to de-emphasize the ceremonials without actually breaking away from the homeland. Others would maintain the old customs for a while, but gradually, as minority groups, they, too, would abandon the elaborate rituals. The splinter groups that moved away may well have completely and at once abandoned the entire complex of offending ceremonialism. Other splinter groups may have abandoned but parts of the complex.

This, of course, is difficult to demonstrate from archeological evidence, but it does provide an explanation for some of the archeologically and historically demonstrable facts. One way of getting at some of these things—of tracing Caddoan relationships with the Plains as well as with other areas—is by both intensive and extensive trait distribution studies. This is a resource that is yet to be exploited, except for the ceramic studies that have been carried on, and it is a potential source of answers to many of the Caddoan problems.

Smithsonian Institution
Missouri Basin Project
Lincoln, Nebraska

Relationships Between the Caddoan Area and Texas¹

EDWARD B. JELKS

This discussion will consider relations between the Caddoan Area and certain archeological complexes to the west, southwest, and south in Texas.

On the Archaic level there are three neighboring complexes which, because of their geographical proximity, might be expected to show some relationship with the Caddoan Area. These are the Trinity Aspect of north-central Texas, the Edwards Plateau Aspect of central and west-central Texas, and an unnamed Archaic manifestation of the southeastern Texas Gulf coast.

While Archaic components have been reported in the Caddoan Area, none of them has been properly excavated, and consequently they are known almost entirely from surface collections. Small campsites with no visible evidence of permanent structures are typical. Sites tend to be on the crests of hills overlooking stream valleys. Traits include milling stones, pitted stones, grooved and polished stone axes, gouges, and dart point types Gary, Yarbrough, Wells, Kent, and Ellis.

The Trinity Aspect is centered in the upper Trinity River area, two foci, Carrollton and Elam, having been recognized. Several distinctive types of dart points are associated with the Trinity Aspect, including three principal dart point types of the Caddoan Area—Gary, Ellis, and Yarbrough. Certain other types diagnostic of the Trinity Aspect (types Carrollton and Elam are the most distinctive) seem to be of local distribution, however, and are absent or extremely rare in Caddoan Area sites. Other traits of the two areas are not shared; consequently the only apparent evidence of inter-area contact lies in the sharing of the three dart point types.

¹ This paper was presented at a symposium entitled "Relationships between the Caddoan Area and Neighboring Areas," which was part of the program of the 23rd Annual Meeting of the Society for American Archaeology, held at the University of Oklahoma, Norman, Oklahoma, May 1-3, 1958.

The Edwards Plateau Aspect of central and west-central Texas features an impressive variety of chipped stone implements. Some Edwards Plateau dart point types have been reported from post-Archaic sites in the Caddoan area, and they may occur as trade items in Archaic sites there as well. Caddoan Area artifacts, including arrow points, knives, and ceramics of both the Gibson and Fulton Aspects, have been found in central Texas sites; but in all cases these trade items appear to have been associated with the later Central Texas Aspect rather than with the Edwards Plateau Aspect. Several of the sites involved contain components of both complexes, however, and although it does not appear too likely at this time, the possibility remains that there may have been active trade from the Caddoan Area into central Texas on the Archaic level.

Manifestations of an Archaic occupation south of the Caddoan Area along the Gulf coast were recognized by Joe Ben Wheat as a result of excavations at the Addicks Reservoir near Houston. Because of insufficient data the complex has not yet been clearly defined, but it is apparent that considerable mixture of types obtains, some from central Texas, some from the coast, and others from the Caddoan Area or related complexes in southwestern Louisiana.

In summary, it may be stated that, by and large, Archaic complexes in north-central, central, and southeastern Texas are quite distinct from the known complexes of the Caddoan Area. It is true that some inter-areal contacts are indicated by sharing of certain dart point types with north-central and southeastern Texas and by occasional trade items which occur in all the complexes concerned. But there is certainly no evidence to suggest intensive contacts between the Caddoan Area and any of these neighboring Archaic complexes. Unfortunately, the Archaic of the Caddoan Area is little known, and it is to be hoped that future research will clarify its present obscurity. Despite the incomplete data, however, it is clear that its affiliations lie for the most part with what may be broadly termed the Southeastern Archaic to the east.

Caddoan Area complexes of the Neo-American, or Neo-Indian, Stage, like those of the Archaic, are largely oriented toward the southeast. Nonetheless, there are also strong ties between some of the Caddoan foci and certain complexes to the west, southwest, and south. These complexes are the Henrietta Focus, the Central Texas Aspect, and the Galveston Bay Focus.

The Henrietta Focus of north-central Texas is known from a series of components which seem to represent temporary or semi-permanent

habitation sites. Traits include hoes made from bison scapulae and skulls; 4-edge beveled knives; small snub-nosed end-scrapers; a plain, shell-tempered pottery (*Nocona Plain*); and arrow point types Harrell, Young, Clifton, Fresno, Scallorn, and Perdiz. Trade items from the Caddoan Area (or possibly from some other related southeastern area) include celts and Alba arrow points.

The Central Texas Aspect, as its name implies, is located in the central portion of the state. Most components of this complex are small campsites with no evidence of permanent structures. Some of the more significant traits of the Central Texas Aspect are: a plain, bone-tempered pottery (*Doss Red Ware*); snub-nosed end-scrapers; 4-edge beveled knives; and arrow point types Scallorn, Eddy, Perdiz, Clifton, and Fresno. Trade material from the Caddoan Area occurs in small quantity at many sites. Potsherds of Sanders, Alto, and Frankston Focus types have been found in addition to Copena type knives and Alba and Bonham arrow points. All excavated and reported sites of the Central Texas Aspect lie along or west of the Balcones Escarpment and therefore are at least 100 miles removed from the Caddoan Area proper. Many sites have been recorded, however, in the strip of intervening territory between the Balcones Escarpment and the Caddoan Area, especially to the east and northeast of Waco. Surface collections from these sites frequently contain more or less equal quantities of Caddoan and Central Texas Aspect artifact types, and it is quite possible that very strong ties between central and eastern Texas may be revealed when some of these intermediate sites have been excavated and studied.

To the south of the Caddoan Area, on the Texas Gulf coast, are found archeological remains of what has been termed the Galveston Bay Focus. This complex is distinguished by a unique kind of pottery of Woodland shape, with conoidal or rounded base, some vessels being plain while others have simple incised designs around the rim. These pottery forms have been described by Joe Ben Wheat under the type names *Goose Creek Plain* and *Goose Creek Incised*. Chipped stone traits of the Galveston Bay Focus include 4-edge alternately beveled knives, small snub-nosed end-scrapers, and arrow point types Perdiz, Scallorn, Clifton, Fresno, and Alba. Like Henrietta Focus and Central Texas Aspect sites, components of the Galveston Bay Focus seem to represent temporary campsites with no permanent houses or other structures. An occasional sherd of Caddoan Area pottery occurs as trade material in components of the Galveston Bay Focus, both Gibson and Fulton Aspect types being represented. The

Alba arrow points, which could have derived either from the Caddoan Area or from southwestern Louisiana, appear to be indigenous rather than an indication of trade, however, since Alba is one of the dominant types in Galveston Bay Focus sites.

The three Neo-American complexes described above certainly are closely inter-related. All are characterized by temporary habitation sites with small midden accumulations, and specific artifact traits are shared between the three. All possess such generalized Plains Area traits as small snub-nosed end-scrapers, 4-edge alternately beveled knives, and triangular arrow points, and such specific traits as arrow point types Scallorn, Perdiz, Clifton, and Fresno. Yet each of the complexes has its own pottery, distinct from that of the others, as well as other peculiar, unshared traits. In order to make the picture complete, it should be pointed out that the Rockport Focus, which adjoins the Galveston Bay Focus on the west, also shares the same generalized Plains traits except for 4-edge alternately beveled knives and has the same arrow point types. But it has its own distinctive pottery and other unshared traits. The same assemblage of types, except arrow point type Scallorn, extends westward from central Texas into the Trans-Pecos area where, again, it occurs in association with traits peculiar to that region.

In view of this general situation, one would appear to be on reasonably firm ground in hypothecating the diffusion of certain distinctive traits, at a definite period in time, over a large portion of Texas. These traits are of a generalized Plains character and include 4-edge alternately beveled knives, snub-nosed end-scrapers, and triangular arrow points. Diffusion, rather than replacement of the incumbent populations by invaders, must have been responsible, since distinctive local traits survive in all sub-areas from the underlying Archaic complexes into the subsequent period. The regional differences in pottery types and other traits also suggest that local groups adopted the new traits and added them to their cultural inventories. This development, which swept over the entire central and much of the western portions of the state, extended from Red River to the Gulf coast and westward well beyond the Pecos River. Its impact was also felt along the western edge of the southeastern pine belt, but it did not extend farther to the east.

Turning finally to the Caddoan Area specifically, we find these same generalized Plains traits appearing in Caddoan contexts. The Sanders Focus, for example, has 4-edge alternately beveled knives and snub-nosed end-scrapers, as well as bison scapula hoes similar to

those of the Henrietta Focus. Snub-nosed end-scrapers are also reported from the Davis site, type site for the Alto Focus. Frankston Focus, of the later Fulton Aspect, has 4-edge alternately beveled knives, snub-nosed end-scrapers, and Perdiz arrow points, and most other foci of the Fulton Aspect include triangular arrow points among their traits. Plains accretions to the northern part of the Caddoan Area probably derived from Plains groups in Oklahoma, or possibly Kansas. But accretions to the Frankston Focus undoubtedly came from central Texas, since that is the nearest possible source not only for the generalized Plains traits, but also for the Perdiz arrow points which accompany them in the Frankston Focus. In addition, Frankston Focus sherds are commonly found as trade items in central Texas Aspect components. The Toyah Focus (the later of the two foci of the Central Texas Aspect) is thought to be ancestral to the historic Tonkawa while the Frankston Focus is believed to be the prehistoric equivalent of the Hasinai Caddo group. Four-edge beveled knives and snub-nosed end-scrapers are common to both complexes, and Perdiz is the dominant arrow point type of each. Of considerable interest, then, is the recently discovered resemblance between the kinship terminology of the Tonkawa and Hasinai Caddo groups of the post-contact period. Rudolph C. Troike, who made a detailed linguistic study of the two kinship systems, has pointed out that the Tonkawa kinship terminology is virtually identical to that of the Hasinai, although their languages are otherwise dissimilar. He also presents documentary and linguistic evidence to demonstrate rather conclusively that the adoption of the Hasinai terminology by the Tonkawa took place prior to the period of European contact. This suggests that the Tonkawa and Hasinai had more than a nodding acquaintanceship in prehistoric times, a conjecture which is supported by the archeology.

The development sequence in the Caddoan Area paralleled, in a general sort of way, that of the three neighboring sub-areas under consideration. In each case a rather distinctive local Archaic complex preceded a subsequent Neo-American complex, with carryovers of specific types showing that the Archaic populations were at least partially ancestral to the Neo-American ones. In the Caddoan Area and in the central Texas area two temporal divisions within the Neo-American stage have been recognized: the earlier Austin Focus and the later Toyah Focus in central Texas, and the Gibson Aspect followed by the Fulton Aspect in the Caddoan Area. Similar divisions may exist in the north-central and southeastern Texas sub-areas but, if so, they have not yet been recognized. In the Gibson Aspect and

also in the Austin Focus the earliest stemmed arrow points have expanded or rectangular stems, while later arrow points in both areas have contracting stems. Such parallel development may indicate that contacts between the areas were established at a relatively early date.

As was pointed out previously, there is an intermediate zone between central Texas and the Caddoan Area where amalgamations of traits from both areas are suspected. Farther north a similar situation exists, exemplified by the Wylie, Fort Coffee, and Turkey Bluff foci, each of which exhibits a more or less equal mixture of Plains and Caddoan Area traits. Recent salvage excavations at McGee Bend Reservoir, on the southern margin of the Caddoan Area, revealed several sites where Fulton Aspect material is mixed with artifacts similar to those of the Galveston Bay Focus. Thus there is a curved strip of territory skirting the western and southern edges of the Caddoan Area where Caddoan Area traits are combined with traits of complexes to the west and south.

In summary, it is clear that Caddoan Area peoples were influenced prehistorically by neighboring peoples to the west and south. The intensity and duration of the influences are not yet fully known, a defect which may be remedied by additional research. It is suggested that investigation of the "buffer" territory along the western and southern margins of the Caddoan Area may hold much of the key data for tracing these influences as well as for correlating the Caddoan Area complexes culturally and chronologically with neighboring complexes to the west and south. Strangely, little evidence of influences in the other direction—that is, from the Caddoan Area into the neighboring areas—has been detected. Intensive, comprehensive studies of all facets of the inter-areal relationships should do much to clarify the picture.

The University of Texas
Austin, Texas

Discussion

By T. N. Campbell

Jelks' paper on cultural relationships between the Caddoan area and adjoining areas in Texas is a straightforward, compact, clearly expressed statement of the status of current knowledge, the main problems that can be recognized today, and what is essential for further progress in this particular sector. I find little that I can disagree with,

either in general or in specific detail. My remarks will be somewhat random and of an amplifying nature.

Jelks ignores the evidence of Paleo-Indian occupation in the Caddoan area, which is obviously intentional and certainly reasonable in view of the tenuous nature of the evidence and the fact that this symposium is more concerned with the opposite end of the chronological column. However, it is of some interest to note that in local surface collections the most common early types of points are Clovis, Scottsbluff, Plainview, and Meserve. Other types are stated to be rare or absent. West and southwest of the Caddoan area Scottsbluff points appear to be notably rare, a distributional detail that may be of some significance in tracing movements of early hunting peoples in this part of North America.

For the Archaic stage in the Caddoan area, particularly in the southwestern quadrant, one can only deplore the lack of attention which its apparently numerous components have received. As in Mesoamerica and elsewhere, the later and more complicated cultures have been too attractive. This neglect of the Archaic is understandable but nevertheless regrettable. As Jelks points out, what is known of the Archaic in the Caddoan area indicates a local distinctiveness that contrasts with known Archaic units to the west and southwest in Texas. It appears to be oriented toward the Archaic of the southeastern United States, but it occupies a marginal position with respect to that region and should share more traits with adjacent areas to the west than Jelks is able to enumerate. It may be that the western margin of the Caddoan area was a more sharply drawn cultural boundary during the Archaic than it was in later times. It is also possible, of course, that the paucity of shared traits is more apparent than real, reflecting imperfect knowledge of Archaic complexes in both areas.

I fear that we cannot expect any early solution to problems connected with the Archaic stage of the Caddoan and adjoining areas in Texas. Ideally, for the Caddoan area specialist, the first order of business should be concentration on the nebulous East Texas Aspect, followed by definition of Archaic complexes immediately south and southwest of the Caddoan area. It is pertinent here to note that the projectile point typology developed and used in the Texas field greatly facilitates comparative studies of Archaic units.

Perhaps the most interesting problem in Jelks' paper is the proper interpretation of the so-called generalized Plains traits in western Caddoan complexes and in the late prehistoric and early historic cultures of northern, central, and southern Texas. The most common

and widespread artifacts named by Jelks are triangular arrowpoints, four-edged beveled knives, and small, well-made end-scrapers. These appear to be related to hunting, butchering, and processing hides, particularly of the bison. Jelks discusses these traits in terms of their occurrence in roughly the eastern half of Texas and merely points to their probable southern Plains derivation. Documenting the spread of this cluster of Plains traits is going to be difficult unless more cultural units are defined in the southern Plains area itself. Except for certain Paleo-Indian occupations and the relatively late Antelope Creek and Optima foci of the Texas and Oklahoma Panhandles, very little is known about the southern High Plains. Between the Canadian River of the upper Texas Panhandle and the Pecos River to the south virtually nothing is known of both the Archaic and later prehistoric stages. We must have more excavation in northwestern Texas, eastern New Mexico, and western Oklahoma before we can begin to talk intelligibly about the southwestward diffusion of specific Plains traits into the central, southern, and lower eastern parts of Texas. Jelks has phrased for us an interesting problem for further investigation.

The Plains traits in the western Caddo foci are to some extent illuminated by certain ethnographic details concerning the historic Caddo in Texas, particularly the Hasinai groups, who are linked with the Allen Focus as well as the preceding Frankston Focus of the Caddoan area. According to Spanish sources, groups of Hasinai frequently left their forested area to hunt bison in the grasslands of central Texas. One account states that the nearest bison were more than 40 leagues from Hasinai territory. This, of course, is after the Hasinai obtained horses from Europeans, but lengthy bison-hunting trips to the west were probably a very old cultural feature in the western portion of the Caddoan area. The records of the De Soto expedition refer to it. In this we have a specific local mechanism that helps to explain movement of cultural traits from the Caddoan area to central Texas and vice versa. For the most part these hunting trips must have been made into open areas or areas occupied by friendly tribes, and possibly there were sometimes joint bison-hunting expeditions that involved extended visits to friendly villages in central and north-central Texas. If so, this may help to explain the Wylie Focus and other mixed assemblages just west of the Caddoan area.

For the late prehistoric and early prehistoric periods, relationships between the Caddoan area and adjoining areas in Texas would be much clarified by additional detailed ethnohistorical studies. The unpublished archival records, both Spanish and French, have not been

exhausted; they have merely been sampled or skimmed, and principally by historians who are concerned primarily with relations between Europeans and Indians, or between one group of Europeans and their Indian satellites and another similar association. Focusing attention upon each particular Indian group, its movements, and its relationships with all neighboring groups throughout the early historical period will lead to the accumulation of a significant body of ethnohistorical data, useful for interpreting archeological situations and also useful for posing archeological problems. Kelley's studies of the Jumano Indians exemplify this point. Jelks refers to Troike's study of Caddo and Tonkawa kinship terms, which is another example of how archeological objectives in the Caddoan area may be furthered without benefit of excavation.

In conclusion, may I say that I heartily endorse Jelks' suggestion that the greatest need is for more excavation and publication in the "buffer" territory along the western and southern margins of the Caddo area. As so much of our excavation is now determined by the placement of river basin reservoirs, perhaps we should ask our representatives in Congress to be more scientifically selective about the location of Federal dams on the rivers of eastern Texas.

The University of Texas
Austin, Texas

Proceedings of the
Fifth Conference on Caddoan Archeology

Proceedings of the Fifth Conference on Caddoan Archeology

Edited by E. MOTT DAVIS

Contents

| | |
|--|-----|
| INTRODUCTION | 78 |
| Accomplishments of the Conference | 78 |
| Nature of These Proceedings | 79 |
| Participants | 79 |
| Note on Symbols and Maps | 80 |
| DISTINGUISHING THE CADDOAN AREA | 80 |
| Introduction | 80 |
| The Geographical Area | 83 |
| The Formal Taxonomic Division | 86 |
| The Culture-historical Development | 88 |
| Merits of the Name "Caddoan" | 89 |
| ARCHAIC AND EARLY CERAMIC COMPLEXES ANCESTRAL, OR RELATED, TO THE GIBSON ASPECT | 90 |
| East Texas Archaic | 90 |
| Grove Focus | 93 |
| Fourche Maline | 97 |
| Sandy Pottery | 99 |
| Yarbrough, Sanders-like, and Related Sites | 100 |
| Early Crenshaw | 108 |
| Snipes Site, and Further Discussion of Plain Ware | 109 |
| CORRELATION OF LOWER RED RIVER AND CADDOAN SEQUENCES | 111 |
| Alba Points | 114 |
| THE HISTORICAL DEVELOPMENT FROM ARCHAIC TO GIBSON ASPECT | 115 |
| HISTORIC SITES IN THE CADDOAN AREA | 122 |
| GIBSON ASPECT CHRONOLOGY | 130 |
| REFERENCES CITED | 142 |

Introduction

An informal conference of persons interested in problems of the Caddoan archeological area took place at the University of Oklahoma in Norman on April 30 and May 1, 1958. Moderator for this conference was Edward B. Jelks of the University of Texas. This was the Fifth Caddoan Conference.¹ It immediately preceded the 23rd Annual Meeting of the Society for American Archaeology, at which there was a formal symposium on relationships of the Caddoan area with neighboring areas, which appears earlier in this volume.

ACCOMPLISHMENTS OF THE CONFERENCE

Participants in the Conference were supplied in advance with an outline of the topics which it was proposed to discuss. This outline had been drawn up by E. B. Jelks and E. M. Davis as a result of correspondence with many of those who planned to attend. Inevitably, the discussion itself digressed, and the table of contents presented here varies in a number of respects from the original outline.

The conference participants included a number of workers whose interests are primarily in the problems of the Lower Mississippi Valley. As a result, the discussion kept moving into the question of relationships between the Mississippi Valley and the Caddoan area, and the correlation of their chronologies. In general, the Mississippi Valley specialists felt that the earliest Caddoan materials are approximately contemporary with the end of Coles Creek times in the Mississippi Valley, whereas the Caddoan specialists felt that Caddoan materials appear at the beginning of Coles Creek times, or perhaps earlier. This argument has been going on for a long time, and it was not resolved at this conference. Possibly a major result of the conference was that these two schools of thought had an opportunity to find out, after some years, what the other side was thinking.

The other major accomplishment of the conference was an examination of the Archaic antecedents of the Caddoan complexes in the area. A fundamental continuity of culture from the Archaic into the Caddoan cultures, reflected in the carrying over of many stone artifact traits, was emphasized by many of the discussants. The matter of possible transitional complexes—post-Archaic, pre-Caddoan ceramic cultures—was also reviewed in some detail.

¹ Preceding conferences are listed, with references, in the Proceedings of the Fourth Caddoan Conference (Davis, 1961: 2-3).

NATURE OF THESE PROCEEDINGS

The proceedings as recorded here are based on detailed notes taken during the sessions by Rudolph C. Troike, supplemented by more cursory notes by the editor. On the basis of these notes a first draft of the proceedings was written, and mimeographed copies were sent to all participants, who revised and amended the record of their remarks according to their own notes and memories. In a few instances statements were extensively rewritten or added in the course of this procedure, and in all such cases an asterisk has been placed after the participant's name at the beginning of the revised or added statement.

Three persons who were not able to attend the conference—R. K. Harris, W. W. Crook, Jr., and Stephen Williams—submitted statements which were entered into the record and are included here as part of the regular proceedings. Williams was sent a copy of the discussion of his statement, and his comments are included, marked with asterisks as already explained.

Parenthetically, it is worth noting that after wrestling with a good many conference records, it is the editor's experience that good notes, made by a competent person who is reasonably familiar with the problems and the taxonomy of the subject at hand, form a more practical and satisfactory basis for a record of this sort than does a precise stenographic transcription. The latter is more costly to prepare and far more troublesome to edit, because it is unconscionably long and is often less coherent and no more grammatical than good notes; furthermore, it contains little of a substantive nature that can not be caught equally well by a good note-taker.

The editor is grateful to Dr. Troike for his unusually complete record of the conference, to Mrs. Nancy P. Troike for her skill and speed at the typewriter, which made the lengthy record available in mimeographed form soon after the conference, and to the participants for their detailed attention to the editing of their remarks.

PARTICIPANTS

Those contributing to these proceedings, with their affiliations at the time of the conference, are:

David A. Baerreis, University of Wisconsin
Robert E. Bell, University of Oklahoma
Stephan F. Borhegyi, University of Oklahoma
T. N. Campbell, University of Texas
John L. Cotter, National Park Service

W. W. Crook, Jr., Dallas Archeological Society
 E. Mott Davis, University of Texas
 James A. Ford, American Museum of Natural History
 James B. Griffin, University of Michigan
 R. K. Harris, Dallas Archeological Society
 Edward B. Jelks, National Park Service
 Buddy C. Jones, East Texas Archeological Society
 Alex D. Krieger, Riverside Municipal Museum, California
 Charles R. McGimsey III, University of Arkansas
 Robert S. Neitzel, Marksville State Park, Louisiana
 Philip Phillips, Harvard University
 William H. Sears, Florida State Museum
 Robert L. Stephenson, Missouri Basin Project, Smithsonian Institution
 Rudolph C. Troike, University of Texas
 Clarence H. Webb, Shreveport, Louisiana
 Sam Whiteside, East Texas Archeological Society
 Stephen Williams, Harvard University

NOTE ON SYMBOLS AND MAPS

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.

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 the location of sites mentioned in the proceedings (Fig. 3).

Distinguishing the Caddoan Area

INTRODUCTION

Davis: The problem at hand is to compose a statement distinguishing "The Caddoan Area," whether this area is to be taken as a geographical area or an area of study. The initial purpose of such a statement is to serve as an introduction to the forthcoming symposium on the "Relationships Between the Caddoan Area and Neighboring Areas." When Dr. Bell asked me to arrange a Caddo session for the SAA meeting, he specified that the papers should not be overly technical; they should make sense to people not specializing in the Caddoan area. This being the case, it is appropriate to begin the symposium with

some statement as to what we mean when we say "Caddoan Area," so that the speakers at the symposium can assume a certain minimal knowledge on the part of the audience.

The problem of distinguishing the Caddoan Area can be attacked from three directions. I will first speak of each approach briefly and then return to them one by one, soliciting comments and suggestions.

A. "Caddoan Archeology" can refer to the archeology of a particular area, an area which, unfortunately, is not distinct geographically and for which no geographic or political term is available. To define a "Caddoan Area" in terms of geographical bounds is not fully satisfactory, because many archeological materials in the area—specifically, the Archaic and Paleo-Indian materials—are not usually thought of as Caddoan. Also, the area varies according to the period in question—and of course it may change as more work is done. Nevertheless, an area of operations for Caddoan archeologists can be roughly defined, and it was so defined twelve years ago at the first Caddoan symposium. I shall read that definition in the part of this paper devoted to discussion, and will comment on it and invite suggestions.

B. "Caddoan Archeology" can refer to a particular body of archeological materials, for which no formal taxonomic term other than "Caddoan" has been devised. In general, when people say "Caddoan" they mean the Gibson and Fulton aspects. In terms of the McKern system these two intimately related "aspects" would constitute a separate Caddoan "phase" of the Mississippi "pattern."

There is no need to haggle about whether this "Caddoan Phase" is or is not a purely formal, descriptive concept. No one thinks of it in those terms, but rather as something existing in time, a cultural development if you will. Nevertheless, as one stage in the process of analysis we need to view it in the formal sense to see that we have something which can also be treated historically.

What we want to know, then, is, What distinguishes Caddoan from other Mississippian? Of course there is an array of artifact types which are solely Caddoan (Barkman Engraved pottery, Talco points, and so on) but none of which is diagnostic of Caddoan as a whole at any particular time. Then there are some traits which are diagnostic of the aspects, Gibson or Fulton; these are Caddoan diagnostics at particular times, but are not diagnostic of Caddoan as a whole. And finally there are actual Caddoan diagnostics.

I will present a suggested list of diagnostic traits later in this presentation. The list is rather sketchy. I think it is well worth working out in detail some time.

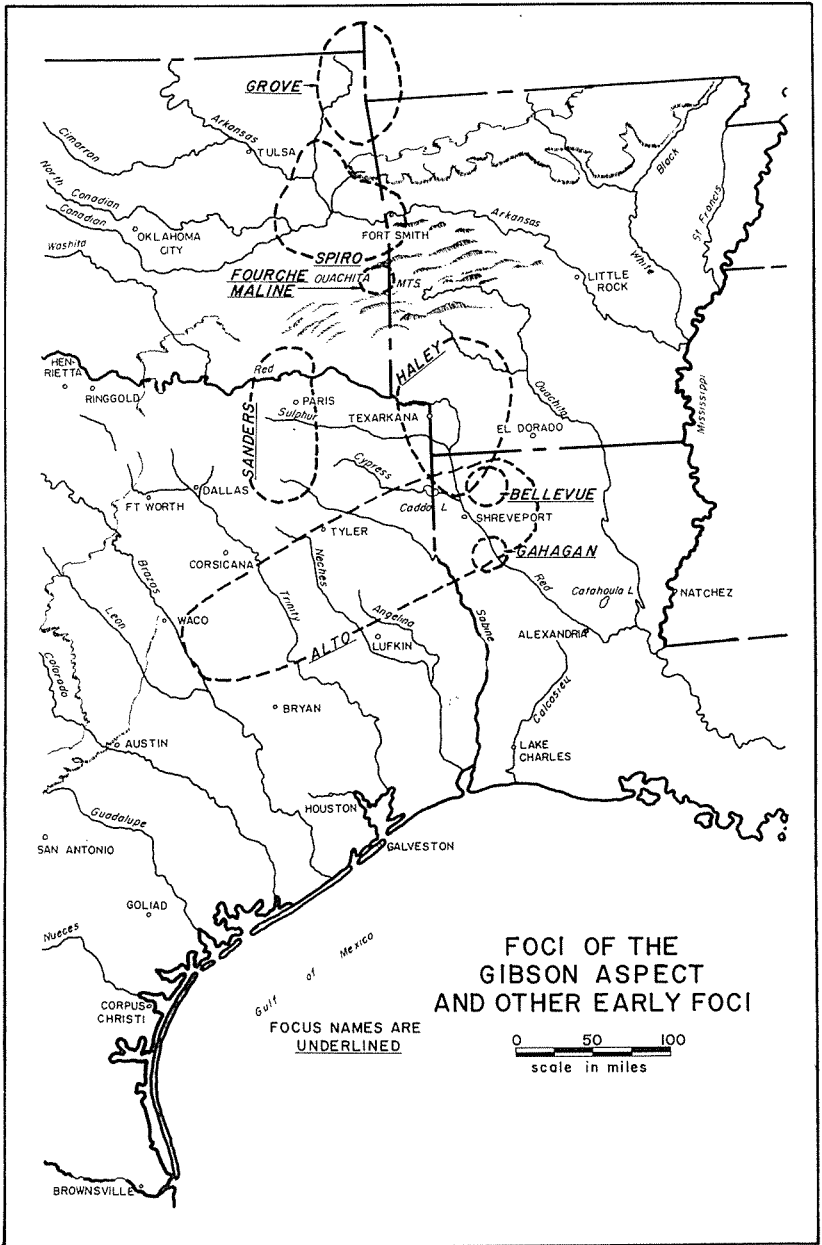


Fig. 1.

C. "Caddoan Archeology" can refer to a particular culture-historical sequence, distinct from other sequences in the way that any history is distinct from any other history, whether because of the presence of particular elements, or the arrangements of the elements, or both. Perhaps this is what we *really* mean by "The Caddoan Area." To do a complete job of distinguishing the area in these terms would be to tell the whole story of Caddoan prehistory. For our purposes it should suffice to mention a few trends and sequences which distinguish the Caddoan development from other developments, and I will present a few later on.

With the general situation in mind, we can look at the three aspects of the problem in detail. I solicit comments on these details.

THE GEOGRAPHICAL AREA

In his report on the First Caddoan Conference, Krieger (1947: 199) says, "[In the Conference] the area was taken to include the adjoining sectors of Oklahoma, Arkansas, Louisiana, and Texas, bordered (approximately) by the Arkansas River on the north, by a line about 100 miles inland from the Gulf of Mexico on the south, a line running from about Tulsa to Dallas to Waco on the west, and by Bayou Maçon in eastern Louisiana and Arkansas on the east. The western and eastern boundaries just mentioned apply to historic times, whereas earlier 'Caddoan' remains are confined to a much narrower belt stretching north and south along an axis formed by the Oklahoma-Arkansas and the Texas-Louisiana borders."

In the twelve years which have elapsed since this definition was drawn up, have we learned enough to be able to define the boundaries of the Caddoan area more accurately?

Krieger: The lower Ouachita River would now be a better eastern boundary than Bayou Maçon.

Davis: The Douglas, Greer, and Old River Landing Sites, which were discussed at last year's conference, are on the lower Arkansas east of the Ouachita. Last year there was a question whether the Caddoan pottery in them was of such a nature to merit their being called Caddoan sites. It seems to be a matter of definition.

Webb: Instead of saying that the Ouachita is the boundary, we should say the Ouachita and its immediate tributaries. For instance, there are some Caddoan materials on Bayou Bartholomew.

Baerreis: The reference to the Arkansas River as the northern boundary originally included its tributaries. Caddoan materials go up

the Grand River to the Kansas line. No survey work has been done up the river beyond the state line into Kansas, to determine how far the materials extend. A Caddoan mound group has been found near Miami in the northeastern corner of Oklahoma—the northernmost thus far located. The sites are very scattered along the Grand; it is not a dense occupation.

Krieger: * I would agree with the boundaries as stated in my original definition, with some modification. The Arkansas River is a suitable northern boundry except for an extension into the northeast corner of Oklahoma as mentioned by Baerreis. There are no Caddoan *occupation* sites as far west as the Dallas area, for although Hogge Bridge and other sites in that area do have some Caddoan pottery, the sherds agree so well with those of the Frankston and Sanders foci (and perhaps others) farther east, that it is probably all trade ware. The area between the Brazos and Trinity rivers is largely unstudied, but it can be said that the Chupek site near Waco has enough pottery of Alto Focus types, as well as Copena blades and Alba points, so that it looks like an outlying, western component of Alto Focus. It also has pottery in lesser amounts from other Caddoan foci. Near Bryan there is another site with Alto focus pottery, Copena blades, and Alba points which apparently does not have other admixtures and may also be regarded as a small outlying settlement far west of the main Alto Focus area.

Swanton thinks that De Soto found Caddoan people living as far west as the middle Trinity River in 1542. When La Salle built Fort St. Louis on Lavaca Bay in 1685, it is said that “Genis” ambassadors came toward the fort, but it is hard to say how far they may have traveled.

Baerreis: I hope the area is not going to be defined on the basis of Caddoan-*speaking* groups, since this would include the Pawnee, Arikara, and Wichita, and would make the area pretty big and meaningless archeologically.

Davis: Here the two connotations of “Caddoan”—linguistic and archeological—are causing difficulty. The use of what in the strictest sense is a linguistic term for an archeological area was discussed at the First Conference as being misleading. There has been some dissatisfaction with the term “Caddoan” for this reason, but no real problem. I am going to bring this subject up for brief discussion as a postscript to this presentation.

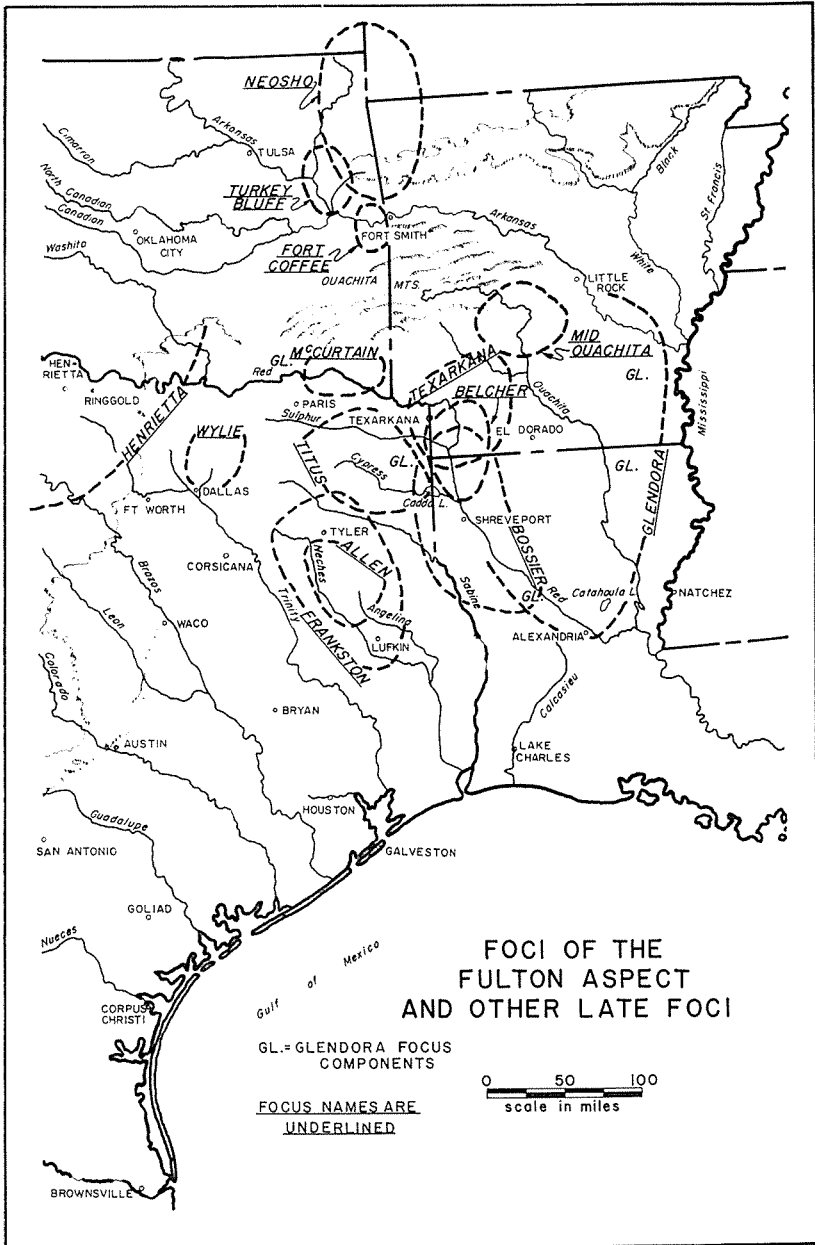


Fig. 2.

THE FORMAL TAXONOMIC DIVISION

Davis: It has been difficult for me to find distinguishing Caddoan traits, partly because of my inadequate knowledge of Mississippian archeology, and also because the problem has not been discussed in the literature. But here is the list I have come up with:

Pan-Caddoan traits:

1. Carinated bowls and variations on that shape.
2. Bone tempering.
3. Relative popularity of engraving.
4. Relative popularity of the interlocking scroll motif.
5. No painted design (a negative trait).
6. Houses with a central fireplace having a large post-mold underneath it, indicating the use of a temporary center post in erecting the house.

Baerreis: Narrow-necked spouts? *Webb:* Bottles with narrow necks.

Davis: These are early only, and do not characterize the whole tradition.

Ford: Polished pottery.

Krieger: The bottle form. *Davis:* Does this occur in Mississippian?

Krieger: The scroll motif occurs in the Southwest and Southeast.

Davis: I should emphasize that many of these traits are to be defined in terms of relative popularity. The scroll is *more popular* here than elsewhere; that is all.

Ford: Do you mean the scroll or the meander? *Davis:* I mean the scroll. It is not limited to any one vessel form.

Ford: Platform pipes. *Krieger:* *Distinctive* platform pipes, or better, just distinctive pipe forms.

(Speaker unidentified): Earth lodges? *Davis:* There are no earth lodges of the Plains type in the Caddoan area. The only distinctive Caddoan house type that I know of is the kind in which the center post was used in construction and then was removed, leaving a post-mold under the fireplace. Is this trait found anywhere else? [No one knew of other instances.]

Krieger: Large burial pits. *Jelks:* We are trying to find traits which distinguish this area from the Southeast, and the Southeast has large

burial pits. *Ford*: This points up the difficulty of finding hard and fast characteristics to define cultural units, such as was tried in the Midwestern System. Engraving is found in the Southeast, and the interlocking scroll is found in the Mississippi Valley and is all over the Southeast on the historic level.

Krieger: * We may as well admit that traits found *only* in Caddoan (not to mention *only* in Gibson or *only* in Fulton) are hard to come by, and we can only be confident of a number of *concentrations* or *emphases* such as engraving, excising of polished surfaces, paint in lines, certain vessel forms, graves, and so forth.

Baerreis: The Caddoan culture is an attenuated Southeastern culture. After these people moved into this area from the east, distinctive characters developed.

Jelks: Is bone temper in pottery a distinctive Caddoan trait? It is found at the Davis and Sanders sites. *Webb*: I am not sure whether it was found at Gahagan; perhaps some bone-tempered sherds were on the surface. It was present in about 3% frequency in the Belcher site. *Jelks*: Bone tempering is consistent in all Caddoan sites, in percentages from 3% to 30%.

[Ed. note: From the above discussion, other traits can be added to the list:

Relative popularity of: polished pottery, excising of polished surfaces, paint rubbed into engraved lines.

Distinctive pipe forms.]

Traits characterizing the Gibson Aspect:

1. Long-stemmed pipes.
2. Bottles with long tapering spouts.
3. Pottery types Hickory, Holly, and Crockett.
4. Fine-line engraving.
5. Large deep burial pits.
6. Alba points.

Discussion: Are the large deep burial pits all in the Gibson Aspect?

Krieger: They survived into the McCurtain Focus, hence should not be considered exclusive to the Gibson Aspect. *Davis*: * Then they are not diagnostic of Gibson Aspect, but are only most characteristic of Gibson Aspect.

Davis: What about the Alba points? *Krieger*: They are a Gibson

Aspect trait. *Davis*: Don't they occur farther east? *Discussion*: These are Alba-like. *Webb*: There are illustrations of Alba-like points from the Gordon site, a Coles Creek site. *Ford*: Alba points constitute an ordinary trait in late Coles Creek. At the Greenhouse site five were found, and later a boy found 75 in the backdirt.

Webb: * The Gibson Aspect Alba points are different from the Alba-like points farther east. I believe that rectangular-based Alba points, and Hayes points, are distinguishing traits of the Gibson Aspect.

Distinguishing traits, Fulton Aspect:

1. Wide-mouth vessels with high flaring rims.
2. Relative popularity of quadrated interlocking scroll motif.
3. Conical bowl pipes.
4. Spurred line scrolls.

Webb: Add "cross-hatched engraving as a background motif." *Ford*: Early Troyville has some cross-hatched incising, not engraving, but otherwise it isn't found outside the Caddoan area. *Jelks*: Within the Caddoan area, what is its distribution? *Webb*: Only in the Fulton Aspect, although Haley Focus may have some.

Webb: Possibly we should add the folded meander to the list.

THE CULTURE-HISTORICAL DEVELOPMENT

Davis: It is the culture-historical development in its entirety which sets off the Caddoan Area; specific, distinct features are hard to isolate. For instance, there is the possible early start of platform mounds and Southern Cult material in the Caddoan area, perhaps as early as A.D. 400. In the Gibson Aspect, there were large ceremonial centers with platform mounds, pit burials, and multiple interments. Changes from Gibson Aspect to Fulton Aspect involve the following: a shift in area eastward; a change in typical sites from the big ceremonial centers to large graveyards of individual burials; brushing of utility pottery becomes important; engraving becomes coarse; shell temper appears. There is little information on possible changes in settlement patterns, beyond the change in ceremonial centers.

Does anyone have corrections, additions, or other comments to make regarding this statement? I shall be using it as the basis for my remarks at the Symposium [No comments].

Of course it is more than just a matter of making that presentation. The whole problem of distinguishing the Caddoan Area, insofar as

it is a valid problem, is, in effect, the problem of the relation of the Caddoan Area to the Southeast as a whole. Was it an attenuated local development, as Baerreis suggested a little while ago? How isolated was it?

MERITS OF THE NAME "CADDOAN"

Davis: Now, as a postscript to this discussion, I should like to consider the use of the name, "Caddoan," for the archeological area. At the First Caddoan Conference, Mera objected to it because it is a linguistic term. Already in our discussion this morning, the two connotations—linguistic and archeological—have been confused once. At the First Caddoan Conference, it was proposed that a new term be found, and shortly thereafter Newkumet came up with the term "Habiukut," which Krieger (1947: 206) included in his report of the Conference. As far as I know this term has been used only once in print—by Orr in the *Cole Festschrift* (Orr, 1952: 239)—and then only half-heartedly. Jelks and I have been discussing terms, looking for a good one. We tried putting the four state names together, but *Okarklatex* didn't work very well, nor did any other combination. We tried the first letters alone, but could come up only with "Alto," and that is preempted. The name "Caddoan" may be perfectly all right, as long as the connotation is made explicit; but I note that authors are constantly putting it in quotation marks, as if it weren't quite acceptable. This seems an opportune time to discuss the matter briefly.

Phillips: Are we talking about an area or a culture? *Davis:* We are talking about a taxonomic unit. We have no single name in current usage to designate the geographical area involved; the area does not correspond to any modern political subdivision.

Webb: How about "Southern Caddo"?

Ford: Has anyone ever really been tripped up by the possible confusion in meanings?

Campbell: Why change now?

Baerreis: The name is already embedded in the literature.

Krieger: In Mexico, linguistic terms are used very commonly to designate the archeological complexes and developments found in certain areas, such as Mayan, Totonac, and Tarascan. These terms don't bother anybody. I see no objection to continuing the term "Caddoan Area." There is no need for confusion.

Troiike:* There are difficulties in Mexico rising from the use of linguistic terms. Even the leading Mexican archeologists are not uncommonly led astray in their thinking by an unconscious one-to-one correlation of the linguistic and the archeological concepts.

Krieger:* Yes, there are such difficulties in any terminology used. Terms never actually explain anything; they are conveniences or labels which themselves must be explained to the uninitiated. I don't think that "Caddoan" is any more difficult to understand or explain than "Mayan," "Tarascan," or any other similar term. Archeology suffers, not from the terms themselves, but from their common use *without definitions*.

Jelks: Are there any objections to the term "Caddoan" now? [No objections.] That seems to settle the matter.

Archaic and Early Ceramic Complexes Ancestral, or Related, to the Gibson Aspect

EAST TEXAS ARCHAIC

Krieger: Many sites in East Texas have no pottery, but do have Alba projectile points. There are also several hundred sites with Alba points and very little pottery—a poor plain ware. No tabulation of such sites has ever been made, but it needs to be done. There should be a survey of these sites. Small milling stones and nut stones are found in these sites; they run from the Archaic through the Caddoan sequence. Polished and grooved stone axes are found in the Archaic but do not continue into Gibson Aspect. Boatstones are found in these "transitional Archaic" plain pottery sites, but only rarely, and a few plummets are found in northeasternmost Texas. Most large projectile point types with definite notched stems continue into Gibson Aspect.

Ford: When did the changeover take place? When is the end of the East Texas Archaic? *Krieger*: When the major Caddoan traits appear. There aren't many transitional sites, though there are these lithic sites with a little plain pottery. And there is the Bellevue Focus near Shreveport. *Webb*: The Bellevue Focus is north, east, and southeast of Shreveport. Four sites have been excavated, and more surveyed. In one site there are no identifiable Marksville sherds. On each of the rest of the sites only two or three Marksville sherds are found. *Ford*: But even at Marksville, only 8% to 10% of the sherds are decorated. *Krieger*:

Similarly, in East Texas if you have just a handful of sherds from the surface of a site, the probability is that they will all be plain, and unidentifiable. Were there any Marksville sherds at Poverty Point? *Ford*: No. Only fiber tempered sherds. *Webb*:* There were also some Coles Creek sherds, probably intrusive (*Ford and Webb, 1956: 105-106*). There was Marksville material at the Jackson site adjoining Poverty Point.

Webb: The "East Texas Archaic" is not limited to that area alone; it extends also into Louisiana and Arkansas.¹ In Arkansas, the Mineral Springs, Ozan, and Washington sites have similar materials, and they are also found in northern Louisiana. You have to consider a larger region in order to find real differences. In northwestern Louisiana there are only a few lithic sites. When you get into the Bellevue Focus, the lithic materials are about the same as in the Archaic, with scrapers, nut stones, and so forth. Even in Bossier Focus, most projectile points are of large Archaic types.

Krieger: Here is a rough chart of the situation in East Texas:

5. Fulton
4. Gibson
3. Pottery
2. Arrowpoints
1. Archaic

The divisions are not sharp; this is really a site classification. "Arrowpoints" means Archaic-plus-arrowpoints. "Pottery" represents a stage, as yet not demonstrated, with small arrowpoints, Archaic materials, and plain sherds not now identifiable as to source, but possibly from Fourche Maline, Marksville, Hopewell, or some other source. Arrowpoints could have come into the area before pottery.

Jones: There is a difference in Archaic sites in East Texas, just as *Krieger* suggests. Some of the sites have arrowpoints. On minor streams along the upper Sabine, there is a definite break between sites. There are a few large points, small points, and plain sherds. Four variants of the Alba point occur.

Krieger: It is not known how much time is involved here. The origin of the pottery is a major problem.

¹ *Webb* has since proposed (1960: 47) the name "Red River Aspect" to cover this material. However, more recently it has been noted that there is already a Red River Aspect in Minnesota (*Wilford, 1955: 137-138*), so that either the old name must be retained or another new one adopted.—EMD

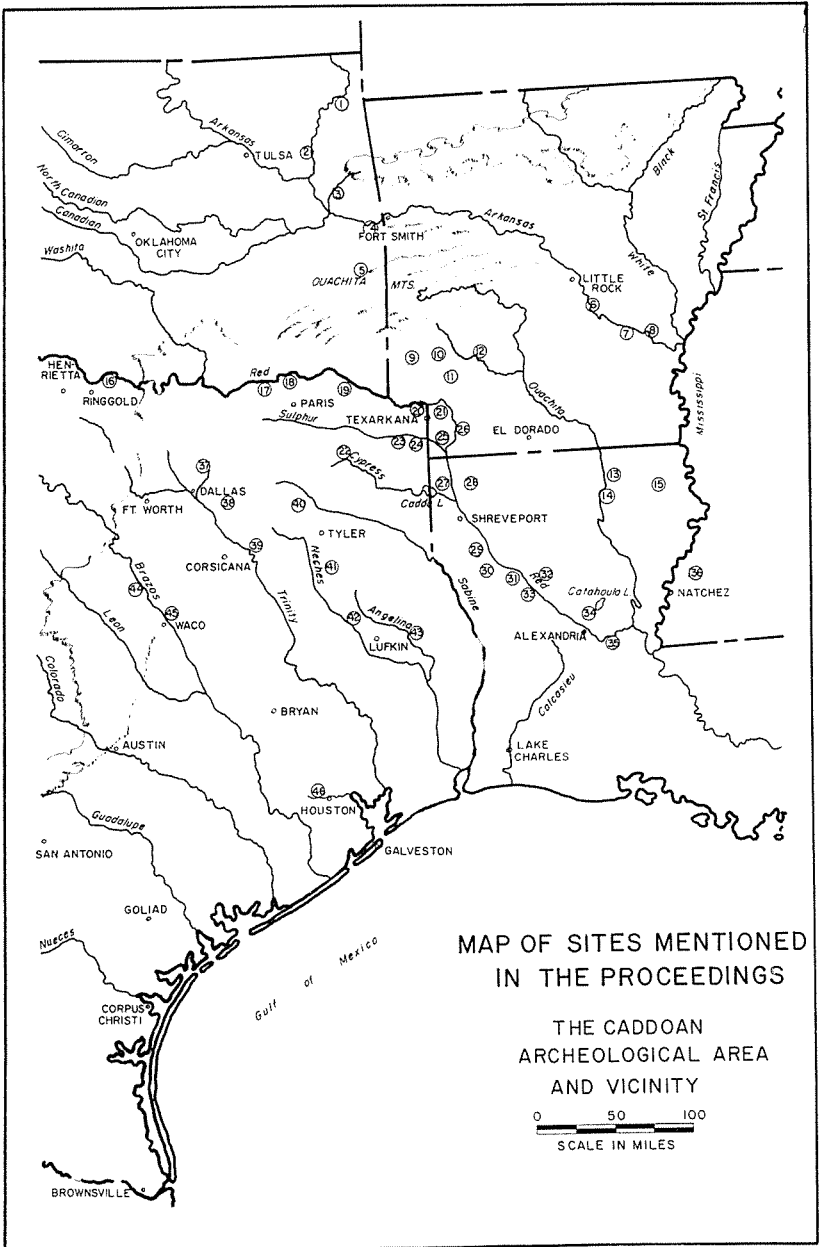


Fig. 3.

GROVE FOCUS

Baerreis: I would like to present the relationships of the Grove Focus as a point of departure. For the past year I have been re-analyzing the material from northeastern Oklahoma, obtained from a series of WPA digs and still unstudied here in the Museum. In 1951 Bell and I did a review, published in the Bulletin of the Texas Archeological Society, in which we showed the sequence in Northeastern Oklahoma thus

| | | |
|--------------------------|--------------------------|-------------------------|
| <i>Numerical</i> | 24—Sanson | Haley—25 |
| 1—Reed | 35—Greenhouse, Av-25 | Harlan—2 |
| 2—Harlan | 36—Gordon | Hatchel—20 |
| 3—Brackett, Vanderpool | 37—Hogge Bridge | Hogge Bridge—37 |
| 4—Spiro | 38—Talty, Blain, Miklas | Hunt—24 |
| 5—Scott | 39—Trinidad | Jim Allen—41 |
| 6—Greer | 40—Yarbrough | Kaufman—19 |
| 7—Douglas | 41—Jim Allen | Keith—22 |
| 8—Old River Landing | 42—Davis | Keno—13 |
| 9—Mineral Springs | 43—McGee Bend Reservoir, | Kirkham—12 |
| 10—Ozan | Wylie Price | Lawton—33 |
| 11—Washington | 44—Stansbury | Leary—20 |
| 12—Kirkham | 45—Chupek | Los Adais—30 |
| 13—Keno | 46—Addicks Reservoir | McGee Bend Reservoir—43 |
| 14—Glendora | <i>Alphabetical</i> | Miklas—38 |
| 15—Poverty Point | Addicks Reservoir—46 | Mineral Springs—9 |
| 16—Spanish Fort | Allen Plantation—31 | Mounds Plantation—27 |
| 17—Sanders | Av-25—35 | Old River Landing—8 |
| 18—Womack | Battle Mound—26 | Ozan—10 |
| 19—Kaufman | Belcher Mound—27 | Poverty Point—15 |
| 20—Leary, Hatchel | Bellevue—28 | Reed—1 |
| 21—Crenshaw | Blain—38 | Sanders—17 |
| 22—Hale, Keith | Brackett—3 | Sanson—34 |
| 23—Snipes | Chupek—45 | Scott—5 |
| 24—Hunt, Clements | Clements—24 | Smithport Landing—29 |
| 25—Haley | Crenshaw—21 | Snipes—23 |
| 26—Battle | Davis—42 | Spanish Fort—16 |
| 27—Belcher, Mounds | Douglas—7 | Spiro—4 |
| Plantation | Fish Hatchery—33 | Stansbury—44 |
| 28—Bellevue | Fredericks—32 | Talty—38 |
| 29—Smithport Landing | Gahagan—30 | Trinidad—39 |
| 30—Gahagen, Gem Island, | Gem Island—30 | Vanderpool—3 |
| Los Adais | Glendora—14 | Washington—11 |
| 31—Wilkinson, Allen | Gordon—36 | Wilkinson Place—31 |
| Plantation | Greenhouse—35 | Womack—18 |
| 32—Fredericks | Greer—6 | Wylie Price—43 |
| 33—Lawton, Fish Hatchery | Hale—22 | Yarbrough—40 |

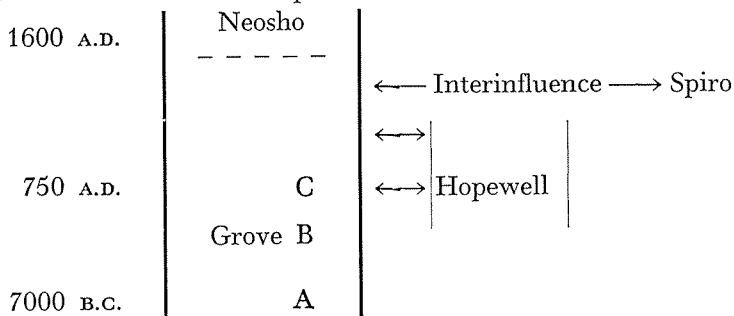
(Bell and Baerreis, 1951: 8):

Neosho
 Spiro
 Hopewellian
 Grove { C
 B
 A

This preliminary analysis had a typical non-ceramic assemblage—Grove A, B, and C—followed by Woodland, which is Hopewellian of the Central and Western type (Kansas City and Missouri Hopewell) and seems to cover some time span, like Middle and Late Hopewell as defined in the northern area. These Woodland materials occurred in stratified sites over Grove.

Also in this area are two other cultures: the expansion of the Spiro Focus into northeastern Oklahoma, and the Neosho Focus, which is similar to Fulton Aspect. We put Spiro between Neosho and Woodland, despite lack of stratigraphic evidence.

However, the chart above is conventional in form and distorts the evidence. Actually in northeastern Oklahoma we have a remarkable continuity of culture, not apparent from the chart. There is definite continuity between the Archaic and each of the other three cultures. The chart is an oversimplification; it implies at best that there was just a handing-down of traits from one successive culture to another. I would now chart the development thus:



The earliest Grove materials seem to date back to 7000 B.C. About the time of Grove C, Hopewellian materials enter and interact with Grove C. We may have to speak of a "Grove D," of sites with Hopewell sherds. This terminated with the appearance of Spiro. Some Archaic tradition survives and interacts with Spiro. About A.D. 1600 the appearance of Neosho (Upper Mississippi?) terminates the earlier interaction.

An ecological approach is fruitful here, for this is a varied area. The river terraces are good agricultural land. The region is also on the margin of the Ozark Plateau, and the rugged foothills present a contrast with the river terraces. The pattern of the Grove Focus was one of hunting small game and gathering, with a tendency to cling to the foothills where the game would be more plentiful, and to the small streams, to hunt and collect seeds. The Grove people could have retained this environment and livelihood even when the Hopewell people moved in and occupied the river terraces. The latter were farmers with milling stones and cache pits for grain storage. The Spiro people utilized the same habitat as the Hopewellians, so that when the Spiro people came in they must have disrupted the Hopewell people. Hopewell refugees could have fled to the hills and taken refuge in the shelters. This gives us the stratification of Woodland over Grove in the shelter sites.

The final complex occupying the marginal zone was the Neosho Focus. These people did some farming but emphasized hunting and gathering. They stayed in the foothills and small valleys; there is only one Neosho Focus site known on a river terrace.

The main point of this is that the heading "Transition from Archaic to Gibson Aspect" [originally used for this part of the Conference discussion] may be misleading. By the occupation of complementary ecological niches, the Archaic could have survived side by side with Gibson Aspect.

Krieger: Can you be sure that the very first pottery is Hopewellian?

Baerreis: The very first is "Early Woodland": this is partly a matter of definition. A few early Woodland sherds have a thick beveled lip; this is early Hopewell; it still comes from the north. Ceramics support the idea of interacting cultures in that we have also some hybrid types of dentate stamped pottery with shell temper. Some are probably trade pieces; others are degenerate hybrids.

These sites seem to tell a different story from what Krieger described for East Texas; and I think that the Fourche Maline Focus presents much the same situation. The initial pottery in the north is different from the situation in the south. Gibson Aspect in this area will probably show more Archaic traits than in the center of the Caddoan area proper, though whether their source is by borrowing is uncertain. All these Grove Focus sites are in the bend of the Neosho River. The Reed site is an example of a northern Spiro site, and there are other Spiro sites farther north, probably up into Kansas. Up here, Spiro sites are

very scattered. In Ottawa County are more sites, now flooded. No survey has been carried into Kansas.

Langtry and Gary dart points run through the entire sequence in northeastern Oklahoma, from Grove A through Neosho. This is also true of milling stones (which are characteristic of Hopewell here but not elsewhere; wooden mortars were probably used elsewhere). There is probably a substantial lithic assemblage for which this long duration holds true. Complexes coming into the area probably took up these traits.

Jelks: What about chipped stone in complexes in neighboring regions? Is there only a pottery tradition sweeping into this area?

Baerreis: The only site reported in detail is Wedel's Renner site near Kansas City, and the lithic assemblage there shows strong similarities to the Oklahoma material. No comparable information is available elsewhere. In the Kansas City Hopewellian complexes, pottery was proportionately scarce in relation to the lithic assemblage.

Grove C has small arrowpoints (which are not Caddoan points) and does not have pottery. Perhaps this means that the sites are not *pre*-pottery, but represent a time of interaction with a pottery focus, possibly Spiro.

Krieger: Do you think Grove C is contemporary with the Spiro sites? *Baerreis*: It is a real possibility.

Krieger: Are there small points in the Hopewellian sites? How thoroughly were the sites dug? *Baerreis*: The sites were dug thoroughly; there are 10,000 to 15,000 chipped stone implements from each site. There are 4,000 projectile points; but on the Hopewellian level there are only 10 to 12 small points, which could have been intrusive.

Krieger: Is this true of Hopewell in general? Are there small points in Hopewell? *Phillips*: There is no good information on Hopewellian villages; anything is possible. *Sears*: I don't know of any small points in Hopewellian Period sites in the Southeast. *Webb*: There are none in Bellevue. *Phillips*: I don't know of any in the Lower Mississippi—but we don't have proper data.

Phillips: Is Bellevue Focus like the situation in northeastern Oklahoma—that is, is it an attenuated Hopewellian? *Webb*: The pottery decoration fits the pattern of Marksville or Troyville Stamped, but the paste is not like that of the central Louisiana materials. *Phillips*: Otherwise the sites are a continuation of the East Texas Archaic?

Webb: Yes. *Phillips:* So the situation is like that in northeastern Oklahoma.

Webb: We have not found this Bellevue situation on other mounds in northwestern Louisiana. These Bellevue sites are low mounds, with cremations at the base or flexed burials on a low platform, one of the cremations containing 40 to 50 stone beads and three rolled copper beads, scattered around. At the Bellevue Mound we found 400 sherds, of which only 1% to 2% were decorated. At the site with the rolled copper beads, we found three Marksville Stamped sherds and one Marksville Incised sherd. Some of the rims are notched, transversely or obliquely.

Ford: North of Vicksburg, the early Baytown sites are small mounds with very little decorated pottery—less than the 8% at the mouth of the Red; the situation is similar to Bellevue.

FOURCHE MALINE

Bell: In WPA days, more than 20 sites were dug on the Poteau and its tributary, the Fourche Maline. The materials looked like Archaic and early Woodland. The analysis was done on the total lumped collection from 20 to 25 sites. Among the materials were worked bone, heavy projectile points, heavy stone implements, ground stone—celts, full-grooved axes, boatstones, plummets—some shell, and a thick heavy granular-tempered pottery.

When I came to Oklahoma and began work on these materials I wanted to see whether the Archaic-like materials could be differentiated from the pottery. Construction of the Wister Reservoir, now covering the area, enabled further excavation, and I selected the Scott site, with a five-foot deposit. The lower two feet had no pottery. From the upper three feet we defined Williams Plain pottery, a granular, clay-tempered type. The inventory from this one site is not large enough to enable full differentiation of the WPA collection into "Lower Fourche Maline" and "Upper Fourche Maline," except on a purely typological basis. More extensive analysis of the collections by sites may make it possible to work the whole thing out.

The WPA sites were completely excavated, not just sampled. If we can get reports on these sites we can perhaps work out a sequence. There doesn't seem to be much change in the overall complex when pottery comes in.

This Williams Plain pottery in late Fourche Maline seems to be an early form of ware found all over southeastern Oklahoma. It is just

about the same as the utility ware at Spiro, Harlan, Brackett, and other Gibson sites. Thus you have a carry-over into the Gibson Aspect. Now and then in a Fourche Maline site we find a Gibson-like pot, so that we may have an overlap or inter-change with early Gibson. In the known Fourche Maline area there are mound sites which have never been dug; if we can dig them, they may help us understand the relationship, between Fourche Maline and the Gibson Aspect.

There is some cremation in both Fourche Maline and Gibson Aspect sites. They also both have boatstones. But in general, the two—Fourche Maline and Gibson Aspect—have different flavors.

Fourche Maline-like material is found all the way south to McCurtain County, north to the Arkansas River, and east into Arkansas along the Petit Jean. Also, Williams Plain is very like the earliest Ozark Bluff Dweller pottery.

Another complex which is relevant to this problem is found at the Vanderpool site, in the Ft. Gibson reservoir area on the Grand River. It is really a series of connected sites along the river. Here I have collected a lot of crude heavy chipped implements, choppers, digging tools, scrapers, and rough core materials. It is a big assemblage. At first we thought it was Archaic, but when we dug we found Williams Plain pottery. This material has not been published. I have been referring to it as "pre-Gibson," but it is above the Archaic.

Fourche Maline and Vanderpool are two examples that I have found of the possible Archaic-Gibson transition. They are related to each other insofar as Williams Plain pottery is concerned.

Jelks: You mentioned the occurrence of pottery here. Where do arrowpoints come in? Do you have an "arrowpoint stage" like Krieger's?

Bell: That depends upon what you mean by "arrowpoints." If you mean the small pressure-chipped "bird points," they do not appear until after the pottery comes in. They do not occur at all in the Vanderpool site, unless perhaps on the surface.

Webb: Is there any bone tempering in Fourche Maline? *Bell:* Williams Plain has a little bone tempering, mixed in with the clay. I have segregated these sherds and studied their distribution, but it seems to be entirely random; I cannot find any stratigraphic evidence as yet.

Krieger: The Fourche Maline and Vanderpool pottery is not Hopewellian, is it? *Bell:* No. *Ford:* Do you find Hopewellian flake knives in these sites? *Bell:* No; the knives here are worked on both faces, and are square-ended or oval. The houses are square in outline, with a short trench passage entrance. There are usually six central roof sup-

ports. This is not the typical Gibson house pattern, but it is interesting because pre-Gibson houses are hard to find.

Krieger [referring back to his chart, p. 91]: I do not visualize the situation in East Texas as simply as this chart would imply. It is not a neat layer-cake situation. Baerreis' chart [p. 94] is a very good approach to the matter, and it may well be that the East Texas situation was similar to that in northeastern Oklahoma. Simple succession is not the proper model; we should not think of abrupt culture changes in unilinear sequence.

It looks as if Fourche Maline may represent a pre-Gibson ceramic complex having only large heavy projectile points, like the Woodland situation. It may be that as we move south, the arrowpoints come in without any pottery.

Ford: Note that the situation of an Archaic complex existing into recent times is found in Central Texas, where the Archaic lasted into historic times. Probably this circumstance occurred because the area is peripheral to the Mississippi Valley. Similarly, on the Atlantic Coast you find early stamped wares lasting into the historic period. You do not find persistences like this in the central area. We had wild savages on the peripheries.

SANDY POTTERY

Jelks: This question of whether arrowpoints or pottery appeared first is a knotty problem. In the Galveston Bay material excavated by Wheat at the Addicks Reservoir near Houston—outside the Caddoan area—there was a consistent sequence. At the bottom was an Archaic complex like that which underlies Caddoan in East Texas. Then above it you have the same complex plus sandy pottery; and shortly afterward, arrowpoints appear.

In the McGee Bend Reservoir on the Angelina River in east Texas we have been finding some very similar sandy ware mixed right in with Caddoan ceramics. This is the same as the sandy ware at the Davis site, which I determined by checking the original Davis site sherds. The vessels of the sandy-tempered ware (Goose Creek ware) on the coast are in this form [Fig. 4], very like the Woodland tradition.

Clay tempering appears later on the coast, and spreads down the coast to Corpus Christi, in the Rockport Focus, in which the vessels have incising on the rim and asphalt decoration. It is known that in

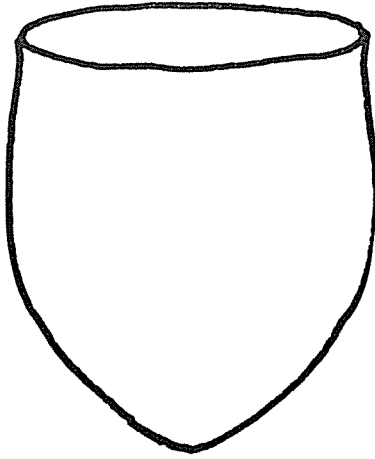


Fig. 4. Form of Sand-tempered Coastal Pottery.

this latter region this pottery was being made in historic times by the Karankawa, since it is found with points chipped from glass and European materials.

Wheat thought that at Addicks Reservoir this sand-tempered Goose Creek ware was contemporaneous in part with Tchefuncte, since he identified several sherds from one vessel as Tchefuncte, although Griffin disagreed with the identification. If Wheat is right, this sandy ware covers a long time span.

Krieger: The sandy pottery is better-made as time goes on. At first it is crude, and about a half-inch thick. Later, incised and punctate designs appear on the rim. It diffused as far down the coast as Corpus Christi. *Campbell*: Yes, essentially the same pottery is found around Corpus Christi.

Jelks: Archaic peoples adopted this ware. I don't know its source. *Ford*: It is found all over the place.

YARBROUGH, SANDERS-LIKE, AND RELATED SITES

Jelks: Along the upper Sabine we find small Archaic sites, and occasionally one will have a few sherds, and now and then an arrow-point, on the surface. Only one site, the Yarbrough site, has been excavated. The sherds are Caddoan—that is, the paste is Caddoan, with clay and occasionally bone tempering. Most of it is plain, with a little of it decorated—some are Canton Incised, some have simple engraving, some have scalloped lips. Essentially, this is a simplified version

of the Sanders Focus pottery from the Sanders site itself, which in turn is simpler than most Gibson Aspect material. There is no elaborate material in these sites, just a simple ware associated with typically Archaic material. The idea has been suggested that if there is a "Caddoan ceramic tradition," this might represent the earliest developmental stage.

Crook and Harris have made a study of similar materials in the same area and have submitted a statement on it.

[The following statement by Crook and Harris, who were unable to attend the Conference, was read into the record.]

*A Type of Pottery Site in North Central Texas
That May Be Pre-Gibson*

BY W. W. CROOK, JR., AND R. K. HARRIS

For the past few years we have been making a study of a type of pottery site which may pre-date the Gibson Aspect. Several of these sites have been found in the north-central part of Texas, in an area east of the Trinity River as far east as Wood and Lamar counties, and between Red River and Henderson counties. The purpose of this statement is to place in the record a description of four of these sites. Very few of these sites have been studied, as they are usually rather small sites. Whether we are professional or amateur, we are sometimes prone to overlook the smaller sites and study only the larger ones. We sometimes find that the larger sites contain the remains of two or more groups or foci and are somewhat mixed up, while the smaller sites seem to be the remains of one group and therefore pure sites of the focus represented.

The type of site here discussed is usually found on a low rise or terrace of a river or creek. The top of the rise or terrace is usually made up of several inches of fine blow sand which we have called the Pattillo Sand. This sand may vary from two or three inches to several feet thick depending on erosion from cultivation and blowing wind. These sites are usually located in the top few inches of the sand. They are non-mound sites and usually cover about two acres. Bone material is very scarce—if present at all—but mussel shell is sometimes present. No definite hearths have been found and charcoal is found only in small flecks. The smallness of charcoal pieces resembles the Archaic sites found in the area; however, definite hearths have been found in the Archaic sites in some cases. As these sites will re-

ceive more study in the future, hearths and charcoal samples may be found, and also house sites may be located and excavated. In fact, we now believe that we have located a house in one of these small sites—not discussed here—in the southern part of Dallas County.

The Trinidad Site (H3). This site is located in Henderson County on the plant property of The Texas Power and Light Company. It is located on the east side of the Trinity River and has been mostly destroyed by levee building and erosion, but it formerly covered about two acres of sandy land on a low terrace overlooking the river. The site was almost destroyed during a big overflow in 1943 when the river changed its course and left only a small part of the site undisturbed. This small part of the terrace was later destroyed to build a levee, but before this destruction of the last piece of the original terrace, the stratigraphy of the site was studied. At this point the terrace was composed of the following: From the surface down to a depth of eighteen inches was loose blow sand, below which was a red to yellow clay. The pottery site was located in the top eight or ten inches of the loose blow sand. About two inches above the top of the clay and extending down six or eight inches into the clay was located an Archaic site of the Carrollton Focus. Collections were made from both levels, but here we are concerned with the collection obtained from the pottery level in the top of the sand.

Five pottery sherds were found, of which four are plain and one is decorated with incised parallel straight lines. Four of the sherds are clay tempered and one is bone tempered.

Lithic artifacts found total 132 pieces and are of the following types:

| | |
|-------------------------------------|------------|
| Arrow points, Alba | 4 |
| Dart points, Gary | 73 |
| Dart points, Ellis | 2 |
| Copena points or knives | 3 |
| Drills (unshaped base) | 2 |
| Drills (shaped base; broken Gary) | 1 |
| Turtle-back scrapers | 11 |
| Flake scrapers | 4 |
| Knives (leaf-shaped) | 32 |
| Total: | <u>132</u> |
| Other artifacts found: | |
| Broken celt | 1 |
| Bead made from ironstone concretion | 1 |
| Scraper (mussel shell) | 2 |
| Hoe (mussel shell) | 1 |

The Miklas Site (27D2-1). This site is located on a small sand rise on the east side of King's Creek on the Miklas farm in Kaufman County about $2\frac{1}{2}$ miles southwest of the city of Kaufman. The site is in the top few inches of the blow sand and covers about two or three acres. During the past few years wind action has eroded the surface of this sand, exposing the site, which seems to be six to eight inches deep in the sand.

Forty-five pottery sherds have been found. Four of these sherds are from decorated vessels and forty-one are plain sherds. The decorated sherds are of the following types:

- 1 Weches Fingernail Impressed (about $\frac{1}{3}$ of the vessel)
- 1 Canton Incised
- 1 Sherd with parallel straight lines—engraved
- 1 Sherd with parallel straight lines—incised

The tempering material of seven of the sherds is bone and the other thirty-eight are clay tempered.

Lithic artifacts from the site are as follows:

| | |
|-----------------------------|------------|
| Arrow points, Alba | 10 |
| Arrow points, Bonham-Perdiz | 3 |
| Dart points, Gary | 85 |
| Dart points, Ellis | 1 |
| Drills (unshaped base) | 1 |
| Turtle-back scrapers | 14 |
| Knives (leaf-shaped) | 7 |
| Total: | <u>121</u> |

The Blain Site (27B8-1). This site is located on the west side of King's Creek on the Blain farm about six miles south-southwest of Terrell in Kaufman County. The site is on a low sandy terrace and covers about two acres. Erosion from cultivation and wind action has exposed the site in some places, while in others it is buried. In the deeper sand areas it seems to be six to eight inches in depth. In some of the washes, the sand has been eroded away and the red clay is exposed. The farm is no longer cultivated but is used as a stock farm and grass is covering the site. Near the center of the site is an area where the sand is from eight to ten inches deep and the site remains *in situ*. Excavation is planned in this area in the future.

At this site a total of 80 potsherds have been collected. Five of them are decorated and 75 are plain. Seventy-three of the sherds are clay

tempered and seven are bone tempered. The decorated sherds can be typed as follows:

- 1 Canton Incised
- 1 Free Punctates
- 3 Incised criss-crossed lines

Lithic artifacts collected can be typed as follows:

| | |
|------------------------|----|
| Arrow points, Alba | 3 |
| Arrow points, Clifton | 1 |
| Arrow points, Fresno | 1 |
| Dart points, Gary | 11 |
| Pogo or spear point | 1 |
| Drills (unshaped base) | 1 |
| Turtle-back scrapers | 3 |
| Knives (leaf-shaped) | 2 |
| Total: | 23 |

The Talty Site (27B5-7). This site is located on a small sand rise on the east side of Bachelor Creek in Kaufman County about three miles southwest of Terrell. Cultivation and wind action have eroded most of the site away; however, a small part of the site is still *in situ* near the top of the rise. The loose blow sand at this point seems to be about four or five inches deep. In area the site covers about two acres.

A total of six pottery sherds have been collected, of which five are plain and one is decorated. The decorated sherd has a single incised straight line. Three of the sherds are clay tempered and three are bone tempered.

Lithic artifacts collected are as follows:

| | |
|-----------------------------|----|
| Arrow points, Alba | 5 |
| Arrow points, Bonham-Perdiz | 3 |
| Dart points, Gary | 62 |
| Dart points, Ellis | 1 |
| Dart points, San Patrice | 1 |
| Turtle-back scrapers | 8 |
| Scrapers (broken Gary) | 2 |
| Knives (leaf-shaped) | 11 |
| Total: | 93 |

Comparisons and Conclusions. As the artifacts from all four of the above sites are nearly the same in regard to types and numbers of each type present, we will combine the artifacts from all sites and

then discuss the sites. Below will be found the combined totals for the sites.

| Pottery Sherds | |
|-----------------------------|------------|
| Weches Fingernail Impressed | 1 |
| Canton Incised | 2 |
| Incised straight lines | 3 |
| Incised criss-crossed lines | 3 |
| Engraved straight lines | 1 |
| Free punctates | 1 |
| Total Decorated: | <u>11</u> |
| Plain sherds | 125 |
| Total Sherds: | <u>136</u> |

| Tempering material: | |
|---------------------|-----|
| Clay | 118 |
| Bone | 18 |

| Lithic Artifacts | |
|---------------------|------------|
| Arrow points | 30 |
| Dart points | 239 |
| Pogo or Spear Point | 1 |
| Drills | 5 |
| Scrapers | 42 |
| Knives | 52 |
| Total: | <u>369</u> |

| Mussel Shell Artifacts | |
|------------------------|----------|
| Mussel shell scrapers | 2 |
| Mussel shell hoe | 1 |
| Total: | <u>3</u> |

| Pecked and Polished Artifacts | |
|--------------------------------|----------|
| Celt (broken) | 1 |
| Bead from ironstone concretion | 1 |
| Total: | <u>2</u> |

Total artifacts all four sites 510

1. A total of 136 pottery sherds has been collected. The tempering material of 18 sherds is bone and the other 118 are clay tempered.

This small percentage of bone temper seems to be somewhat like the situation in the Alto Focus. In color, the sherds from the above four sites and related sites resemble sherds from both the Alto and Sanders foci; they are probably more like Sanders Focus sherds in this respect. In terms of decoration, both Alto Focus and Sanders Focus sherds are present. The incised straight lines may represent the Davis Incised type of the Alto Focus; these sherds are small. The free punctates are very much like Alto; however, some free punctates occur at the Sanders site. Comparison may be made with a group of sherds in the collection of R. K. Harris, which were excavated from cache pits at the Sanders site. These pits had only sherds from the Sanders Focus, and the sherds probably represent Sanders utility vessels. On examination, one will find free punctates, a very sloppy Canton Incised, and some type of Pennington or Crockett Incised.

No pipestem fragments have been found at the above four sites, but from sites of this type in Lamar County, at the eastern edge of the area, several fragments of the stems of beautiful long-stemmed pipes like those from Crenshaw have been found. In a burial at the Crenshaw site, excavated by Mr. H. U. Girdley and photographed by Mr. M. P. Miroir, there were found a long-stemmed pipe, several arrow points very close to Alba, and a beautiful Copena point. Copena points were found at Gahagan (Webb and Dodd, 1939) and here we have three Copena points from the Trinidad Site described above. Some may say this is round-about evidence for association, but we believe it is no accident.

At the last Caddoan Conference, Jelks seemed to think that the Sanders Focus is older than has been supposed (Davis, 1961: 9). We agree with him and also wish to state that we think it is time for someone to make a study of the Sanders utility ware, as well as a study of some of the type sites we have described above.

2. Projectile points from the four sites are of two sorts, arrow points and dart points. The dart points far outnumber the arrow points: 239 dart points to 30 arrow points. Of the 30 arrow points, 22 are Alba, an Alto Focus type, and six are Bonham-Perdiz, a Sanders Focus type. We have used the term "Bonham-Perdiz" instead of just "Bonham" because it has been noticed at the Sanders site, at sites like the four above, and in shelter sites along the Brazos River where Sanders Focus pottery sherds are found, that Bonham and Perdiz points grade from one type to the other so that in a single site like Sanders it is hard to distinguish the two types.

Of the 239 dart points found in the four above sites, 231 are Gary

points. Publications on the Sanders Site show no dart points as belonging to the Sanders Focus. However, in the Sanders site cache pits mentioned above, which contained Sanders Focus sherds, 34 dart points were found: 31 Gary, 2 Ellis, one Pogo, and a drill made from a broken Gary point. The dart points at the Sanders site are not found in the areas where recent triangular arrow points are found, but rather with the Sanders Focus material.

3. Although no Cahokia or Harrell points were found in the above four sites, this type of point was found at Spiro, a few were found at Sanders, several were found at Gahagan mixed with Alba points, and several were found mixed with Bonham points in a grave containing two Sanders vessels at a site (probably of the type described above) in Collin County, Texas. The Harrell or Cahokia point may not be a very good time marker.

4. Above all, we need a more thorough study of the Sanders utility ware, a more thorough study of sites in north-central and northeastern Texas which have no mounds, which are seemingly built on an Archaic base, and which have basically plain pottery with some Alto and Sanders decorated ware.

5. Last, but not least, we are in need of more Carbon-14 dates from sites in Texas, Louisiana, Oklahoma, and Arkansas. Such dates should not be too hard to obtain.

[Crook also sent the following statement:]

Crook: In addition to Harris' and my statement, I would like to add a couple of thoughts to the discussion:

(1) Transition from Archaic to Gibson. Whether by conquest or peaceful cultural absorption, the arriving Gibson Aspect people apparently mingled with the Archaic people already present, retaining many of the Archaic traits for a while along with the new culture. According to my personal observation, this Archaic so involved was without exception the "East Texas Archaic" (or some other suitable name, so long as it possessed the Gary type dart point as the major dart point in numbers). True, there is an intermediate zone between East Texas and, for example, our Trinity Aspect, wherein a number of dart types of North Central or Central Texas are found—no doubt as contact material—but the Gary points predominate. The Wylie Focus is a perfect example. The "East Texas Archaic" is related to the general Mississippi Valley, etc., and possessed polished stone and other traits different from the Archaic in north-central Texas, possibly possessing

a cultural level better suited to take on the new Gibson traits. It may even have already been practicing agriculture of some kind; the Leary site of this "East Texas" group near Texarkana has yielded over 1,800 dart points, and it is difficult to imagine such a population center existing long without exhausting the game in the vicinity, unless some other food could support the group!

(2) "Sanders" Utility Pottery. "Sanders" still is 100% grave material from a ceremonial center possessing mounds. Absolutely undescribed and unestablished is its undoubted utility ware which, in outlying centers (non-ceremonial, without mounds and cult), as well as simple "contact" material in adjacent Archaic country, ought to be the main material found! At the Sanders site itself we have a lot of clay-tempered sherds, many plain, a number decorated, which are undoubtedly Gibson Aspect; they certainly would not accompany the side-notched triangular arrow points and shell-tempered pottery of the later occupation. Presumably they are Sanders utility ware. If so, many are very similar to Alto utility wares. Are these sherds specifically "Sanders," are they Alto trade sherds, or are they just general "Gibson utility" sherds in common with most other Gibson Aspect sites? And it is just such material as this that comprises the sherds in our outlying, marginal area sites; except that out here in north-central Texas, where we have no mounds and very little ceremonial burial pottery (though we do get some of both Sanders and Alto!), what do these sherds indicate? Do they represent trade or contact with Sanders Focus, or with Alto Focus, or are they just generalized Gibson Aspect utility sherds? I have a strong hunch that a study of Sanders utility ware will clarify a lot of vague occurrences and associations.

EARLY CRENSHAW

Webb: Early Crenshaw pottery has Coles Creek decoration with some Gibson Aspect characteristics, such as red-filming and pigment impressed into the lines. Ford and Dickinson said that the paste differed from Coles Creek ware elsewhere. The context is that of the Gibson Aspect: the multiple extended burials, the kind and placement of vessels and other artifacts with respect to the bodies, the placing of points in caches or groups, long stemmed pipes, carapace rattles, and colored sand on the floor of the grave—all this is pure Gibson Aspect. The whole situation argues for the contemporaneity of Coles Creek and Gibson Aspect.

Ford: I am challenged to a rebuttal. Where did these Gibson Aspect burial characteristics come from? *Webb:* I don't know; they just ap-

pear here all at once at this time, so that the traits must have been brought in. *Ford*: Might this actually be earlier than Gibson, and might not Gibson Aspect have derived these burial characteristics from this complex? *Webb*: In that case the Coles Creek people would have had to pick up the traits elsewhere and transmit them to Gibson. And in such case, where did the non-Coles Creek Gibson Aspect traits come from? Where did they pick them up? These Gibson Aspect traits are not found elsewhere with Coles Creek. It is easier to assume that the Coles Creek people picked up traits from the Gibson Aspect people.

Ford: True, but there is no evidence for trade between Coles Creek and Gibson Aspect. The wares at Crenshaw are late Coles Creek. I would still prefer to assign this complex to a pre-Gibson Aspect time.

Webb: What about the red filming and the pigment in the lines?

Ford: Red-slipping is an early trait in the Mississippi Valley (Larto Red), though it did not survive throughout the sequence. *Phillips*: There is a good deal of red-slipped French Fork Incised further up the Mississippi Valley in Mississippi. *Ford*: Pigment in the lines is a trait found all over Mesoamerica.

Phillips: Regarding this early Crenshaw material, do you find arrowpoints with the Coles Creek material? Is there not an interspersion of pre-Caddoan and Gibson burials? Lemley speaks of arrowpoints in "pre-Caddoan burials" there. I am not entirely clear which is which.

Webb: These matters are not at all clear.

SNIPES SITE, AND FURTHER DISCUSSION OF PLAIN WARE

Jelks [with specimens]: Here is some pottery from the Snipes site in the Texarkana Reservoir area on the Sulphur River. Would you call this Williams Plain? At this site we found 21 sherds (out of some 4,000) with incised lips and rims like Coles Creek Incised or Chase Incised.

Ford and Phillips: This plain pottery is much the same as Baytown Plain, the clay-tempered ware in the Mississippi Valley; you couldn't separate it if it were mixed in a collection from the Mississippi Valley, except for the sherds with bone temper. *Bell*: This is Williams Plain.

Jelks: There are no square bases at this site. There is Caddoan pottery. The site is very shallow, and the materials are all mixed, possibly due to plowing. Two graves went below the plow zone, and in the fill of these two were Caddoan sherds and also sherds of this Williams

Plain-Baytown Plain. This association could have been caused by gopher activity; it is not possible to validate primary association. Of this plain ware 30% is bone tempered. How is one to interpret it? As Webb has said, it seems to show a Caddoan trait which has relationships with the Mississippi area.

Ford: Might it not be that bone tempering was a western interpretation of the earlier northern Mississippian limestone tempering?

Krieger: Is there any bone tempering in the lower Red River Valley? Haag once told me so. *Phillips*: There is none below the middle Ouachita, and none on the Mississippi unless we have missed it.

Jelks: In some sites near Snipes there are some good Coles Creek vessels.

Phillips: This material is similar to late Coles Creek; there is some evidence that in the Coles Creek and Plaquemine phases the number of lines on the rim diminishes with time until only one remains, then none, or one on the lip. This is the "Baytown Plain with Coles Creek characteristics" of our 1951 survey report [*Phillips et al.*, 1951: 81].

Ford: It is also found at Greenhouse in the Mississippi Valley. Isn't it true that as the pottery complex diffused, the plain ware was accepted before the rest, so that the plain ware spread and was adopted more rapidly than the decorated ware? For instance, in Fourche Maline the plain ware was accepted before the Renner-like material. I think this Snipes pottery came from the Mississippi Valley.

Jelks: Is there any incising in Fourche Maline? *Bell*: Yes, on flower-pot vessels.

Ford: Possibly Fourche Maline material comes from the north. The complex may have been moving in from the Mississippi Valley all the way from Louisiana to Missouri. *Jelks*: But at the Snipes site there were so many Caddoan vessels that they must have been made there.

Baerreis: I doubt that Fourche Maline comes from the north. The burial complex is Southeastern shell-mound Archaic, with the shell and stone implements, the bone tools and the rest of the burial complex. There is definitely an early complex coming in here and it could have persisted for a long time. The plain pottery in the four-state area (Oklahoma-Arkansas-Louisiana-Texas) may be the earliest. I think early pottery in the north is grit-tempered and cord-roughened, or smoothed over cord-roughened. But this Williams Plain ware is not

like that; it is southern smooth-surfaced ware, and may well not have come from the north.

Jelks: Elsewhere in the Texarkana Reservoir area we found Pennington Punctated-Incised and other Alto Focus wares in tight association with this same Williams Plain ware.

Correlation of Lower Red River and Caddoan Sequences

Krieger: There are no Coles Creek components at all in Texas, Oklahoma, or Arkansas; within the Caddoan area they are found only in the Shreveport area. [Ford and Webb concur.] There is a mixture of Coles Creek with Gibson Aspect in northwest Louisiana, and a few Coles Creek trade sherds in northeast Texas; and at Spiro there are some French Fork Incised vessels, probably as a trade ware, from graves in the plowed fields, not from the mounds. At Crenshaw there is a Coles Creek component in the graves. In the report on the Crenshaw Mound, Lemley mis-identified as "Coles Creek" what was later named Davis Incised. Is the Smithport Landing site to be classed as Caddoan or Coles Creek?

Webb: Smithport Landing is mostly Alto Focus, with some Coles Creek pottery. There are no mounds; it is a village site. Mounds Plantation is Caddoan with a lot of Coles Creek; the Coles Creek materials are Coles Creek Incised or Chase Incised with thickened rim, subjacent triangles, lines with triangles between them; there are a few sherds of Beldeau Incised. There is a lot of Hardy Incised, which goes with Coles Creek, Plaquemine, Gibson, and Fulton; it is close kin to Coles Creek Incised, not derived from it. The two types, Coles Creek Incised and Hardy Incised, existed side by side for a long time.

Mounds Plantation also had a few Rhinehart Punctated sherds. One interesting deposit was in the side of a borrow pit there, probably pre-mound (originally there were a dozen mounds there, and a plaza); there were 400 sherds in the deposit. Most of them were plain, many were thick, and 30–40% were bone-tempered. There was some thin polished black ware, some Coles Creek Incised and Chase Incised. It looks like fairly early pottery, with some decorated sherds coming in. In many cases it was not possible to tell whether they were Davis Incised or a wide-line Coles Creek Incised.

Krieger: Was there Coles Creek pottery at Gahagan? *Webb*: In the field, but not in the mound. *Krieger*: That's the way it always is, for instance also at Crenshaw; it is impossible to tie in the Coles Creek

material under these circumstances. *Baerreis*: Not so at Spiro: no Coles Creek pottery came from the field; there it is from the same area as the burials and was surely associated with the burials; it is doubtless a matter of trade there.

Ford: We have gone over this matter many times before in the past years; but the situation is clear at the mouth of the Red River. Here, Caddoan trade materials first appear at the Plaquemine level. Were Coles Creek features perhaps preserved in the Caddo area? We need to show how the trade went both ways. The Greenhouse occupation began in mid-Troyville and continued on into Plaquemine.

Jelks: There were certainly relations between the Caddoan area and the Red River mouth. If Gibson Aspect began contemporaneously with Coles Creek, then at the Plaquemine level, Caddoan material should be of the Fulton Aspect. *Ford*: Call Gibson late Coles Creek. In late Coles Creek there are tapering vessels, but there are no true bottles with necks at the Red River mouth until Plaquemine. *Webb*: These are wide-mouth bottles like Haley Focus bottles. *Jelks*: Taking the list of Gibson Aspect traits drawn up earlier, what do you find in Coles Creek—Gibson Aspect traits or Fulton Aspect traits? *Ford*: In late Coles Creek we get no bottles at all; no long-stemmed pipes; no slender-necked pottery bottles; a little Hickory engraving. Fine-line engraving is Plaquemine; polished plainware is a mid-Coles Creek trait.

Webb: The Gordon site had Crockett Curvilinear Incised; and was a Coles Creek site. *Ford*: It comes at the end of Coles Creek and most of it is Plaquemine. *Phillips*: It is not claimed that there is any Coles Creek component there. *Webb*: There were a few Marksville or Troyville stamped sherds; the site continued late enough to get a few Natchez traits. *Ford*: It was originally my Coles Creek type site. *Phillips*:* That was before Plaquemine had been set off from Coles Creek.

Jelks: It seems to me that Plaquemine is closer to the Fulton Aspect. *Ford*: It is close to both Gibson and Fulton Aspects.

Krieger:* It would be remarkable for two groups living as much as 200 miles apart—at the Davis site and in the Mississippi Valley of Louisiana—to be manufacturing a long series of pottery types in approximately the same percentages or degrees of popularity. I can think of no *cultural* reason for doing so. There is, on the other hand, good evidence of trade between Gibson Aspect and Coles Creek, which to me is better evidence of contemporaneity than any agreements in bar-graphs of relative popularity.

Ford: In the Coles Creek area proper, we have no evidence before Plaquemine times that the Caddoan area existed.

Jelks: In that case, is there anything in Plaquemine to point to trade with Gibson Aspect, or are the Caddoan traits in Plaquemine sites more like those of the Fulton Aspect?

Webb: In Plaquemine, seven pottery types out of a total of sixteen are identical with Bossier Focus types. We are still arguing whether the Sanson site on Catahoula Lake is Caddoan or Plaquemine; the sherds are about 50–50. The Caddoan material is Bossier Focus—hence Fulton Aspect—except for small contracting-stem points which are more like Perdiz points than Bassett points. The rest of the material is Plaquemine, not Natchez. [Ford concurs.]

Baerreis: We must assume for the Caddoan culture a derivation from the Southeast. The Caddoan area is marginal in the Southeast and represents frontier groups moving out of the Southeast and into this area among an Archaic population. We must allow for a population increase in the frontier group, the development of ceremonial centers, and finally a period of expansion and its reflection in Plaquemine. It took time to develop the distinctive Caddoan complex, enough time to develop distinctive trade relationships.

Ford: The Gahagan site weakens this argument. There are Coles Creek sites to the north, but no evidence of trade relationships. Only one site shows Gahagan material in Coles Creek. *Baerreis:* It would be better for my hypothesis if Gahagan had never been found.

Webb: Bellevue-Marksville is the last period in northwestern Louisiana with no Caddoan material. All of the Coles Creek material in the north Louisiana contact zone occurs *with* Caddoan material. The Kirkham site in Arkansas has Coles Creek and Marksville sherds, and two Caddoan sherds. Marksville occurs in the Caddoan area without Caddoan materials. After that, all of the sites have Caddoan materials.

Ford: The term “Coles Creek” has been misused in the past. Coles Creek proper had a distinct area, not extending very far west. It runs from the mouth of Red River west to Alexandria, and up the Mississippi to below Vicksburg. It does not go above that.

Baerreis: You can have intrusion of one culture into another without mixture. A Chinatown in an American city would be an example. *Ford:* But the Chinese still buy food in cans like other Americans. And

in any case, you cannot have intrusion without mixture when the cultures are similar. *Baerreis*:* To be more precise, my point is that one can have a ghetto situation or a hostile military encampment where the amount of cultural exchange would be at a minimum. In such circumstances, archeological clues that would permit cross-dating would be very meager.

Webb: The Fredericks site is the only foreign site on Red River. Is it Marksville or Troyville? *Ford*: I don't know.

ALBA POINTS (Fig. 5)

Webb: What is an Alba point? Does the type encompass both Forms A and B?

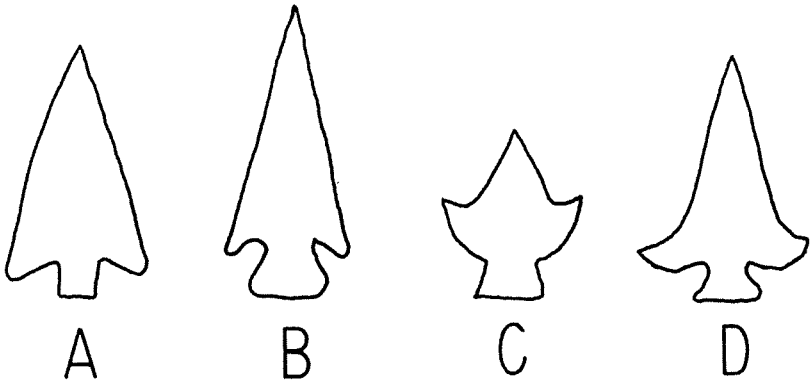


Fig. 5. Arrowpoint Forms.

Form A is a good Gibson Aspect diagnostic, found at Davis, Gahagan, and other places, but not found in central Louisiana. Form B is the "fir tree" type found in Coles Creek and Troyville. What Cotter called Alba points in his Gordon site report were like this B form, except for one. The B form is not too different from Scallorn in Central Texas. We have found many of them in Louisiana. Quimby found Form B in Plaquemine sites.

Bell: I think these two forms occur together in the same quiver of arrows at Spiro.

Ford: It might be possible to prove that one of these forms is earlier.

Bell: Some pointed ones occur at Spiro; Scallorn and Hayes points occur, but I am not certain whether the Hayes type occurs in the same clusters.

Jelks: The bulbous stem is not Scallorn.

Jones: What about Form C?

Webb: This is what we call the Friley point.

Jones: In Gregg County, northeast Texas, and vicinity, Form C occurs in what we call the Sandy Mound Archaic, but sometimes it seems to occur with Forms A and B. It is not found with Scallorn points. We do have Scallorn-like points—Form D—which are distinguishable from Form B; they show features of both B and C.

Webb: The Friley point is localized in northwest Louisiana. The Gem Island site has 40% of this type. Elsewhere they occur in not more than two to three per cent frequency.

Ford: I have not seen these points in central Louisiana. They do not go as far as the Ouachita, though the Alba and "Fir Tree" forms do. *Webb*: The Friley points barely go into Arkansas; but the "Fir Tree" Alba form does.

Jelks: I found Friley points at McGee Bend Reservoir, East Texas.

Webb: The sites in Louisiana where Friley points occur have Caddoan pottery, probably of the Fulton Aspect. There are no excavated occurrences.

Ford: Alba points are from the Huasteca. They reached the mouth of Red River in Troyville times.

The Historical Development from Archaic to Gibson Aspect

Jelks: Following our agenda, we can ask these questions:

Does Gibson Aspect represent: (a) descendants of Archaic peoples with new culture traits, (b) an invasion by a foreign ethnic group, or (c) a combination of both?

If (a), are the new traits a result of local development or diffusion? If (b), where did the foreigners come from and to what extent did they replace the local Archaic peoples?

Did the Gibson Aspect appear in the Caddoan area as a well-developed cultural entity? If not, what evidence is there for a developmental phase?

And finally, where and when did the transition from Archaic to Gibson begin?

Ford: Is there any information on physical anthropology bearing on these questions, or must we argue entirely on cultural grounds? *Jelks*: We have very little skeletal evidence.

Krieger: There is a lot of continuity from Archaic to Gibson Aspect. The full-grooved axe is striking in being one of the few exceptions. It is difficult, under these circumstances, to believe that the appearance of Gibson Aspect represents a sudden population movement into the area; diffusion seems a more likely possibility. Shell tempering, red filming, effigy wares, and appliqué certainly came from the east. But agriculture, platform mounds, and burial mounds are not so readily explained as to origin.

I have been misquoted as saying that the Davis site is the place where the first group out of Mexico settled, but this is not true; it is rather to be taken as *representative* of a cultural movement from Mexico. The majority of ties between the Southeast and Mesoamerica are with the Mesoamerican Late Formative—for instance in the matter of carinated polished bowls, pigment in lines, engraving, and so forth. There may be a connection with the ceramic styles at Teotihuacan. The Hayes point, with diamond-shaped stem and occasionally with serrated blade edges, is found in Haley Focus and occurs in identical form—even including the tiny protrusions on the base and blade—at Teotihuacan, where it was the most common type about A.D. 300–400, possibly A.D. 500.

Another Formative trait is the fundamental idea of a platform mound, without facing. When we begin the Mesoamerican Classic stage, we have stone facing.

The corncobs from the Davis site were identified by Volney Jones as being absolutely the same as ancient and modern Maya corn—not Mexican corn. The Davis site type of corn is found all over the eastern U. S., as far north as the St. Lawrence. We have no idea where it first became established in the U.S., or where the idea of platform mounds was first used.

In 1949 the estimate of the age of the Davis site was made on the basis of comparisons with the Mexican Formative, and it was given as A.D. 500 if not earlier. Then the radiocarbon date of A.D. 398 ± 175 [Sample C-153] came out. I find it hard to believe that that date could be very wrong. It is possible to have falsely recent dates by contamination of the material, or falsely early dates if non-organic carbon from the soil gets into the sample; but these Davis site samples were

clean charred corncobs, in excellent shape. The date, furthermore, does not disagree seriously with the radiocarbon dates Ford has in Troyville and Marksville. Troyville marks the appearance of temple mounds.

Phillips: Regarding the first appearance of temple mounds in the lower Red River area, I don't think Ford is right in placing them as early as Troyville; the earliest datable platform mounds are well within Coles Creek. *Sears*: I agree. *Phillips*: The evidence is not clear at Greenhouse. *Ford*: Yes, it is. The oldest refuse from Greenhouse comes from mounds which have sherds of Troyville and early Coles Creek types; I date these mounds as late Troyville. *Phillips*: Of course there is no sharp Troyville-Coles Creek division, and it depends on how you draw the line. But to make the mounds late Troyville, you have to move Coles Creek types into Troyville. *Ford*: It is a matter of percentage distribution.—For that matter, you have a suggestion of platform mounds in Hopewell and at Marksville.

Phillips: These are platforms, but not platform mounds. They are just piled-up shapeless flat-topped house mounds, gradually built up. You can call them temple mounds if you want, but they aren't. At the point in the history of the Greenhouse site where you can say "This is now a temple mound," you are already in Coles Creek.

Ford: I disagree with all this. The platform temple mounds started in late Troyville. It seems strange that, following your idea, people would have carefully lined up residences in anticipation of a future mound. *Phillips*: Let's hold the question suspended until a better site is at hand. *Ford*: What about Av-25? *Neitzel*: It is different from Greenhouse and from Mississippian. It is not amorphous. It is a real temple mound. There is a Plaquemine overlay. I think I can associate the mound with Troyville, but not as clearly as at Greenhouse. It may be Coles Creek.

Phillips: I think the temple mound and Coles Creek pottery appeared together in the lower Mississippi Valley.

Ford: Griffin started with the assumption that no temple mounds preceded the Mississippian, in his Mississippi Valley Survey.

Krieger: Let's look at the radiocarbon dates we have. [He wrote them on the board:]

| | “Coles Creek” | “Troyville” |
|------|---------------|-------------|
| A.D. | 1310 ± 250 | |
| | 1250 ± 100 | |
| | 1180 | |
| | 1150 | 1090 |
| | 970 | 1050 |
| | 870 | 960 |
| | 820 | 850 |
| | | 780 |
| | | 770 |
| | | 690 |
| | | 650 |
| | | 540 |
| | | 530 |
| | | 510 |
| | | 20 |

Here we have a wide spread of dates. Troyville has dates from A.D. 1090 all the way back to A.D. 20. We still don't know the time of entry of features such as temple mounds.

Sears: The Kolomoki site in Georgia, which has temple mounds, has two radiocarbon dates, one on either side of A.D. 1.

Ford: This illustrates the fallibility of radiocarbon dating.

Sears: Bullen has a Kolomoki period site, in Florida, with good datable material, and a date of A.D. 500.

Krieger: What I am trying to show, and this other evidence supports it, is that temple mounds are earlier than has been thought in the past.

Borhegyi: In Mesoamerica, temple mounds are already present in the Late Formative, as early as 1,000 B.C.

Krieger: * The Mississippi Pattern is very reminiscent of the Formative in Mexico.—The dates for Spiro run from 1800 to 2700 years ago, and although I can't believe that Spiro can possibly date that far back, neither can I believe that it is as recent as most eastern archeologists would like to have it, particularly in view of the Troyville and Coles Creek dates which I listed.

Phillips: I think the best date for Spiro is A.D. 1300; the Southern Cult appears to be a horizon in the Southeast, at about this date. *Sears:* There are two dates from the Etowah Valley in Georgia, for two suc-

cessive cultures, both with Cult material. The dates are in the A.D. 1300–1500 range. The material practically duplicates Spiro. *Krieger*: Falsely late dates are possible because of contamination of radiocarbon samples, but falsely early dates are unlikely. *Phillips*: The late date, A.D. 1300, is good because in the lower Valley whenever you find cult material—which is not very often—it is all Plaquemine or later in date. Since Plaquemine overlies Coles Creek, A.D. 1200–1300 is a good date for the beginning of Plaquemine. How can Middle Spiro be A.D. 500, and Middle Mississippi be A.D. 1300? *Krieger*: But how about the much earlier dates in Mesoamerica? *Phillips*: I don't derive the Southern Cult from Mesoamerica any more. *Ford*: In looking at the possibility of Mesoamerican origins, a big time lag is possible when you get out to the periphery like this, so that the differences in dates may not be surprising.

Krieger: People in the East think of Hopewell as being about the time of Christ, and go on from there. In the Valley the Mississippi pattern may be older than we think.

Phillips: If the Coles Creek dates are correct, then Plaquemine must begin about A.D. 1300. We can't assume the contemporaneity of Mississippian and Coles Creek.

[At this point, Baerreis, Bell, Krieger, and Webb had to leave for a committee meeting.] *Baerreis*: I suggest that the Recording Secretary note our departure, in order that the sudden silence of certain hitherto active participants in this discussion will not be taken to indicate acquiescence or capitulation.

Jelks: Let's get back to the question of *how* the transition from Archaic to Gibson Aspect may have taken place. In the first place, there is continuity from Archaic to Caddoan; the artifact types persist. [All agree on this.] The only interpretation that I can think of, despite the physical evidence, is that indigenous people were certainly involved in what came later, and that some of the stimuli must have come from Mexico. The Caddoan Area seems to be one area where certain Mexican traits got a foothold, however they may have reached this area. Some of the same traits are found also in the Mississippi Valley, but they are more characteristic here in the Caddoan area; and it may be interpreted that they made a beachhead here, grew, and moved on. [No disagreement.]

Ford: I once published a paper demonstrating that the bulk of Caddo

ceramic characteristics moved up from Florida to the Mississippi Valley and into the Caddo area.

Borhegyi: I have been toying with the idea of diffusion by sea from the Huastec coast. Why not think of the Huastecs coming up by boat, regular trading boats, to Galveston or New Orleans? *McGimsey*: Bill Sanders has worked on this idea; he suggested it several years ago in a seminar, and thinks the evidence points that way. *Borhegyi*: We know that in the circum-Caribbean area there were boat routes all over the place.

Jelks: But we can't speak of a time lag by boat.

Ford: There was a time lag already in the Huasteca, since there were unfaced mounds in Huastec III and IV. I think that polished pottery probably came by boat, also small arrow points, and probably religious ideas. The Mississippian people, with temple mounds and agriculture, moved up Red River, mixed with Archaic peoples, developed, set up trade with Huasteca, and picked up the Mexican-origin "Caddoan" traits and some Southwestern elements; and thus the Caddoan development occurred, which in turn affected Mississippi on a late time level. The combination of 75% Mississippian plus 25% Mexican produced the Caddoan tradition, which in turn affected the Southeast.

Jelks: On what horizon would you place this movement from the Mississippi Valley? Would you connect these people with early Crenshaw, Snipes, Fourche Maline, and so forth? *Ford*: Yes; it would be Late Coles Creek-early Plaquemine. This could have been a stagnant area for centuries, preserving ideas received earlier. It remained "hill-billy" until they got a new influence from the agricultural pattern of the Valley.

Jelks: So we have influence from Mexico and from the Mississippi Valley causing the change from Archaic to Gibson Aspect. Were there any other factors or influences?

Phillips: What about Cahokia influences, for instance at Gahagan? *Ford*: Might not the influences have gone the other way? *Phillips*: Possibly; but what about the Long-nosed God? It is widely distributed in the Southeast and in respect to that distribution Gahagan is marginal, so that it seems more likely that the influence went from east to west. *Sears*: Florida is marginal too, in this respect. *Borhegyi*: In Meso-america we have all kinds of long-nosed gods; pick your type.

Phillips: The "cloud-blower" pipe from Gahagan seems to be from the Tennessee-Cumberland area, not native to the Caddoan context.

Ford: Why don't we list the Caddoan traits in terms of the areas from which they came? Let's start with traits which probably came directly from Mexico.

Discussion: Carinated bowls

Polishing

Greque

Zig-zag (in the Alto Focus)

Little Hayes points, 25 mm. long

Engraved shells

Ford: I am not listing temple mounds because I think the Caddoan area got them second-hand, via the Mississippi Valley. The trait of extended burials with quantities of grave goods could be from Mexico.

Phillips: It is common in Hopewell. *Ford*: But does it occur in mounds there? *Sears*: In Illinois Hopewell there are graves which are like the Caddoan graves.

Ford: Now let's list the Caddoan traits which may be from the Mississippi Valley:

Rectangular temple mounds

Plaza orientation

Ceramic complex including: scroll design; quadration (from Marksville-Hopewell); roughening of design background and negative bringing out of design; spurred lines; incised curvilinear design (originally from Florida); concentric circles; distinction between rim and body design (from Hopewell); stamping; incised lines parallel to rim.

Effigies—but not all of them look like Mississippi Valley effigies.

Phillips: Rim effigies on bowls and some other effigies. Negative painting—rare in the Caddoan area.

Ford: Pipe forms from the Mississippi Valley went to the Caddoan area and thence to Mexico. In her study of Mesoamerican pipes, Muriel Porter should not have accepted Willey's and my time estimates made in 1941.

Borhegyi: Cremation probably entered Mexico and Mesoamerica along with pipes. Pipes—Caddoan forms—appear in Mexico about A.D. 1200. Parallel lines occur in Huastec wares.

Jelks: Note that in the case of some of the traits in this list—temple

mounds for instance—some of our four now-absent participants (Baerreis, Bell, Krieger, and Webb) would claim that they moved the other way: from the Caddoan area to the Mississippi Valley.

Krieger:* As far as I am concerned, I have *never* said or claimed that the temple mound idea moved *from* the Caddoan area *to* the Mississippi Valley; yet everyone seems to think that is one of my main ideas. Rather, I claim that all these assumptions about where, how, and when the temple mound idea diffused in the eastern states are highly personal, and no one actually knows the time or direction of its diffusion.

[This was the end of the first day of the conference. Cotter, Griffin, and Stephenson arrived in time to participate in the second day's discussion.]

Historic Sites in the Caddoan Area

[The following statement by Williams, who was not able to be present, was distributed by Phillips:]

A Proposal for the Revision of Terminology for the Historic Phases (Foci) in the Caddo Area

BY STEPHEN WILLIAMS

(This statement is given here as it was presented at the Conference, although both it and the manuscript cited as Williams, 1955, are being revised for publication.—S.W.)

1. Allen Phase (after Suhm, *et al.*, 1954: 219–221).
 - 1.1 Type Component: Jim Allen, Cherokee Co., Texas.
 - 1.2 Other Components: (see reference for list).
 - 1.3 Characteristic Traits: *Patton Engraved*, etc.
 - 1.4 Trade: European Items; *Avery* and *Simms Engraved*.
 - 1.5 Temporal Position: A.D. 1600–1835.
 - 1.6 Ethnic Identification: Hasinai Confederacy (Griffith, 1954).
 - 1.7 Discussion: Some components of this phase were probably still in existence in 1835, as the Kadohadacho joined with the Hasinai in Texas when they moved out of Louisiana at that date. The combined tribes began a westward movement toward the Brazos late in that decade.
2. Lawton Phase (new phase, extracted from old Glendora).
 - 2.1 Type Components: Fish Hatchery site, Natchitoches Parish, La.

- (Walker, 1935); Lawton, Natchitoches Parish, La., (Webb, 1945).
- 2.2 Other Components: Allen Plantation, Wilkinson Place, near Natchitoches, La. (Ford, 1936).
 - 2.3 Characteristic Traits: *Natchitoches Engraved*.
 - 2.4 Trade: European items; *Fatherland Incised*.
 - 2.5 Temporal Position: A.D. 1650–1805.
 - 2.6 Ethnic Identification: Natchitoches Confederacy including the Lower Natchitoches and Doustioni (Swanton, 1952: 205–207).
 - 2.7 Discussion: Components of this phase were subjected to considerable European contact from around 1700, with the French post of Natchitoches being established near them. Another Caddoan group, which is considered slightly divergent, the Adai, had a village near the modern town of Robeline, Natchitoches Parish, La., and they might be included in this phase. The Adai post has been located, but no description of the material has been published so far as I know.
3. Little River Phase (tentative name for new phase set up on historic documentation).
 - 3.1 Type Components: The five major historic villages of the Kadohadacho; three located in Bowie Co., Texas, one in Little River Co. and one in Hempstead Co., Ark.
 - 3.2 Other Components: The historic villages of the Petit Caddo and Yatasi in Caddo Parish, La.
 - 3.3 Characteristic Traits: No archeological materials available.
 - 3.4 Trade: Considerable European trade goods; probably also *Natchitoches Engraved*, and trade pottery from the Ouachita drainage.
 - 3.5 Temporal Position: A.D. 1542–1780.
 - 3.6 Ethnic Identification: The tribes of the Kadohadacho Confederacy including the Kadohadacho, Petit Caddo, Upper Natchitoches, Upper Nasoni, and Nanatsoho. Probably also the Yatasi.
 - 3.7 Discussion: La Harpe had a fort, the Nissonite Post, in this area in 1719. Following pressure from the Osage and a severe epidemic in 1777, the major members of the Kadohadacho Confederacy left their old location in the north and moved into the area around Caddo Lake, northwest of the modern town of Shreveport. The Yatasi village is shown on maps of the period 1816–1839 in southwestern Caddo Parish, just west of the 94th meridian and north of Boggy Bayou (Williams, 1955). None of

these sites is known archeologically. Other possible components of this phase will be discussed later. Query: Is this phase derived from the Texarkana Focus (phase)?

4. Glendora Phase (restricted usage of the old term).

4.1 Type Components: Glendora and Keno, Ouachita Valley, La. (Moore, 1909).

4.2 Other Components: Douglas and Greer, lower Arkansas valley, Arkansas (Moore, 1908).

4.3 Characteristic Traits: see above citations for details.

4.4 Trade: European items; *Fatherland* and *Natchez Incised*.

4.5 Temporal Position: 1600–1750.

4.6 Ethnic Identification: Cahinnio and Ouachita Caddo.

4.7 Discussion: The Cahinnio joined the Kadohadacho before 1780. This more restricted use of the term “Glendora” has been made in an attempt to bring the historic archeology more in line with the known ethnographic distribution of the various Caddoan tribes in eastern Texas, northwestern Louisiana, and southwestern Arkansas.

5. Some Unplaced Historic Components.

5.1 Hunt and Clements, Cass Co., Texas (Suhm, *et al.*, 1954: 225–227). These sites do not fit the historic location of any known Caddoan villages, as has been pointed out before. Until some components of the Little River Phase, to which they are geographically closest, are discovered and described, their phase assignment will have to be withheld.

5.2 Kaufman, Red River Co., Texas (Harris, 1953).

An historic McCurtain focus site. Ethnohistoric identification is uncertain, but it is probably Caddoan. Another possible Little River Phase component in the early historic period.

5.3 Womack, Lamar Co., Texas. (Suhm, *et al.*, 1954: 222). An historic site with more trade goods than Kaufman. A bit too far up the Red River to be one of the named and described major Kadohadacho villages from the documentary evidence, but quite likely a component of the Little River phase.

6. An Unplaced Ethnographic Tribe.

6.1 The Eyeish (Swanton, 1952: 314–315). A group probably related to the Adai. Located on Ayish Bayou, a tributary of the Angelina River. Had a Spanish mission among them from 1716 to 1773. Were on the route from the French post at Natchitoches

to the Spanish Post at Nacogdoches. Not known archeologically so far as I know.

7. Query: What does historic Wichita archeology look like? Could it be confused with the material formerly called "Glendora Focus"?

Bell: Williams is certainly to be commended for his work in this field.

Krieger: Williams uses the term "phase" in place of what is usually called "focus" in the Caddoan area. I see no reason to use the term "phase." *Jelks*: We will use "focus."

Williams:* I have used the term "phase" since I feel strongly that the term "focus" is too closely associated with the rest of the McKern system, which I feel has outlived its usefulness in the eastern United States and in the Caddoan area especially (cf. my review of Webb's Belcher site report [Williams, 1960]), and I prefer the terminology espoused by Willey and Phillips (1958).

Webb: If the Europeans had not appeared for another 200 years, so that this material had had more time to develop, it would have appeared to us as another aspect. It is as different from the Fulton Aspect as Fulton Aspect is from Gibson Aspect, but as it is now we can't separate it from Fulton Aspect. This applies to the Glendora Focus in particular, because on the Red River the trait of mound building, which continues from the Gibson Aspect through the Texarkana and Belcher Foci of the Fulton Aspect, drops out in the Glendora Focus. Also shell tempering has become important and the pottery is quite different.

Davis: I notice Williams has a query (his paragraph 7) about the nature of the historic Wichita materials, and whether they might be confused with Glendora materials.

Bell: They could not be confused with Glendora Focus. *Jelks*: I agree. For instance, at Spanish Fort, an established Wichita site, and Stansbury, which also is a Wichita (Tawakoni) site. *Stephenson*: At Stansbury there were a very few non-distinctive Frankston Focus sherds, and a half-dozen Doss Redware sherds. There was no Glendora Focus material.

Phillips: Williams wanted me to relay some queries. What was found at Los Adais, near Robeline, La.? *Davis*: Fred West discussed this at last year's conference. *Webb*: There are only a few sherds, nothing definitive.

Webb: I note that Williams does not place the Eyeish archeologically. *Jelks*: We have a historic burial at the Wylie Price site in the McGee Bend Reservoir, in the Eyeish country. There were some glass beads, and three pots the likes of which I have never seen before.

Webb: What is the basis of Williams' statement that the Eyeish were related to the Adai? I know of no data. *Campbell*: There is no information to relate these two groups. The Caddo regarded the Eyeish as being very different. The Eyeish may have been hillbillies surviving from earlier times.

Williams: * The Eyeish were listed as *unplaced*. Swanton was the major source for my statement of *probable* relationship to the Adai. There is admittedly little evidence of any definite nature.

Phillips: Another query from Williams: Can Mid-Ouachita Focus be divided into prehistoric and historic foci? *Webb*: Not on present evidence, but possibly it can be done after more work. If historic Mid-Ouachita is distinguished, it will be Glendora Focus; they are so much alike.

Phillips: Williams asks, What about the "restricted Glendora" sites such as Douglas and Greer? [No comments.] Might the Womack site be Wichita, plus Natchitoches Engraved as trade ware? *Krieger*: The Natchitoches Engraved pottery at Womack is good Natchitoches Engraved, and is one of the main traits there. Another is Avery Engraved. A lot of shell temper was used. It is not much like the Wichita sites in Kansas, Oklahoma, and farther west in Texas. There were glazed wares from the Southwest, dated as late 17th-early 18th century in the Rio Grande valley.

Jelks: I note the statement that the Womack site could not have been Kadohadacho. King Harris, from documentary evidence, feels that it was. *Williams*: * Actually, I did not state that the Womack site could not be Kadohadacho. There is no specific documentary evidence that I am aware of for one of the known Kadohadacho villages being in this western location. (See the Nicholas King map of 1806 in Swanton, 1942: 76, and detailed discussion in Williams, 1955). In fact, I have noted it as a *possible* Little River phase component, together with the rest of the members of the Kadohadacho Confederacy. *Webb*: The historic evidence is that the Caddo were moving downstream; but they could have had a major center as far west as Womack in early historic times. *Stephenson*: Do you mean that the Caddo were undergoing a contraction in geographical area? *Webb*: Yes, and an amalgamation.

They were all together before they moved to Texas; the Kadohadacho, Yatasi, Natchitoches, etc., all joined together.

Williams: * The specific details of this southern movement of the major villages of the Kadohadacho outlined in paragraph 3.7 of my proposal will be found in my discussion of the Kadohadacho and related tribes (Williams, 1955; revised version, in press, 1961).

Krieger: Regarding Williams' treatment of the Kaufman site: There is no doubt, to me, that it is a McCurtain Focus component which extends into the historic era. It is certainly Caddoan; the pottery is very consistent. *Baerreis:* How firm is the association of the trade goods with the pots? *Krieger:* Two or three graves are completely different, but they are not involved in this question. The trade goods were in the same graves with the McCurtain Focus pottery, in good association.

Griffin: Is there any possibility that the historic material might have been let down from a different level? *Krieger:* Harris excavated the graves as they were exposed by the river. The information appears to be all right. *Baerreis:* The reason I asked about this matter is that McCurtain Focus sites in Oklahoma have no bones in the graves; only the tooth enamel survives; and one can find the graves only by the soil lines, tooth enamel, and vessel clusters. Most sites have later intrusive Creek and Choctaw burials with well-preserved bones and historic materials. In Oklahoma it is possible to separate the McCurtain Focus components, but it is easy to have mixture of components and one has to be very careful in digging out graves, due to their superposition.

Krieger: There is no systematic excavation in any McCurtain Focus site in Texas.

At the Hunt and Clements cemetery sites in Cass County, Texas, as many as 100 graves were torn out by amateurs. Jackson excavated a number of graves in 1932. In one grave he found a badly rusted knife blade which he thought may have been intrusive, and in four or five graves he found glass beads at the neck. It was a messed-up situation, but he did the best he could, and the associations seem all right. There is some Avery Engraved pottery here.

At the Jim Allen site the situation was similar. It had been badly disturbed. Woolsey, in 1935, did the best he could to record some information, and he dug a few undisturbed graves. The pottery complex seems to be distinctive; it is a historic continuation from prehistoric Frankston Focus pottery, and it can be distinguished from the latter by changes in vessel forms, projectile points, and other traits. There are

five examples of shell-tempered Avery Engraved pottery associated with European trade goods here. If you found these Avery Engraved vessels in Red River County, where the Kaufman site is, you would not be able to separate them from local pieces.

In short, the McCurtain Focus appears to extend into historic times.

Baerreis: It is certainly possible that you are right about that; but it looks as if we have a good deal to learn about McCurtain Focus. There is so much material that is poorly controlled. Some of the McCurtain Focus mounds are larger than one would expect to have been constructed in relatively late times. Also you get deep burial shafts in the big mounds, stone earspools, and other things which look more like late Gibson Aspect than Fulton Aspect. It may be that we are working with multi-component sites, and that there are several phases to McCurtain Focus, which can be worked out with careful analysis.

Krieger: * One big problem here is to determine what is meant by "Historic Times." When European trade goods are found in an archeological site, we tend to explain and date them in terms of an expedition or trading post or mission in the immediate vicinity, but this is not the only possible explanation. The Indians themselves could, of course, have carried these objects respectable distances themselves, either going after them or using them as trade objects from tribe to tribe. In most of the Caddoan region it is not only difficult to determine just where the first expeditions went, but when European goods could have entered the region from far away. In my 1946 publication [Krieger, 1946], I mentioned that by the time La Salle reached the Ceniz (or Tejas) in central East Texas in 1686, he found these people already receiving Spanish objects from New Mexico by Indian trade, specifically through the Jumanos; that this sort of contact had probably been going on at least a century or two before that, as shown by changes in native pottery styles in both the Caddoan region and the Rio Grande Valley in northern New Mexico; and that it was conceivable that Spanish trade material had been brought into the Caddoan region from missions or mining towns in northern Mexico as well as New Mexico, long in advance of the Spanish in person. Later, I learned that in the lower Rio Grande Valley, in present Tamaulipas, the Spanish town of Cerralvo had been founded in 1583 as the first capital of the original province of Nuevo Leon, and that Spanish miners had already been at Cerralvo for some years before that.

The point is that, with the Jumanos traveling back and forth between the Tejas on the one hand, and the settlements of northern

Mexico and New Mexico on the other, a few European objects *could* have appeared in the Caddoan region from late in the 16th century onward. The first Spanish mission was founded in East Texas in 1691; the French post at Natchitoches, Louisiana, in 1714; and there were enough Europeans in the region by then so that the whole 18th century can safely be called "Historic." The De Soto expedition of 1541–43 comes to mind, of course, as the first *entrada* of Europeans in this region. However, this expedition was not equipped for Indian trade in the first place and the chances are about nil that the archeologist can ever find anything to identify with it. These circumstances pose an interesting question for the archeologist: Can he assume that the mere physical presence of Europeans marks the beginning of "Historic Times" even if he cannot find any material evidence of it; or conversely, can he assume that "Historic Times" begin with the presence of European trade items even if Europeans themselves did not appear until long afterward? Or must he have evidence of intimate contact locally? Incidentally, it is very doubtful if glass beads or metal objects from the Spanish can be distinguished from those of the French, but some of the English beads are quite distinctive.

It may be well to point out here the striking scarcity of European objects in historic Caddoan sites when we consider how many Indians and whites were involved over a period of two centuries or more. In any one site, something like twenty beads and two bits of iron may be all that can be found to represent perhaps a century of contact; and this being true, there must be scores of sites actually occupied during the same "historic period" from which the archeologist cannot recover a single European object.

*Williams:** I would like to reinforce further Krieger's statement about the scarcity of trade goods on the historic level. Although I have listed considerable trade goods as a trait of the Little River phase (paragraph 3.4 of my proposal) on the basis of early accounts of gift lists to the Kadohadacho in the eighteenth century in which many pounds of glass beads and metal objects are included (Swanton, 1942: 199–202), it is a fact that *none* of this material has been found archeologically.

Stephenson: The scarcity of trade goods is also true in the Missouri Valley in North and South Dakota. In big historic village sites, occupied for a century, you may get only a tiny amount of trade goods. In Nebraska and Kansas, on the other hand, there are historic sites with a great deal of trade material. *Whiteside:** Doesn't this reflect differ-

ences in trading patterns? The fur trade was not important in the Caddoan Area.

Webb: McCurtain Focus and Belcher Focus are typologically quite similar. They share the same pottery types and both have a carry-over of Gibson Aspect traits. No trade material has been found in the five or six Belcher Focus sites that have been examined. But from the upper level of the Belcher mound we have recently obtained a radiocarbon date of 200 ± 100 years before the present. *Baerreis*: A.D. 1658 is very late for such material.

Gibson Aspect Chronology

Krieger: Here is a historical resumé of how the present classification was worked up. C. B. Moore was the first to work in the Caddoan Area. Then Harrington worked in 1920 for the Heye Foundation. After that, little was done until Webb began working around Shreveport. Then there was some work by the University of Texas, and finally the WPA digs at the Davis, Yarbrough, Hatchel and Spiro sites, and in central Arkansas. Most of this work has never been published. Phillips worked in the Arkansas plateau, but that is not published. Contrast this situation with a comparable area, the Four-Corners area in the Southwest, where there have been innumerable expeditions. Those people once thought they knew the history of the Puebloans; but now, almost every time a major site is dug they have to revise some of their opinions. By contrast, the amount of work in the Caddoan Area is very small. We have a large area, with complicated problems, a time span as long as the Puebloan span, and very few workers. It stands to reason that every new piece of work will produce new information.

[Krieger put the following chart on the blackboard:]

| | | | | | | | |
|--------|---|---------|---------|-----------|-----------|-----------|---------|
| | (| Allen | | | | Glendora | |
| Fulton | (| | | | | | |
| Aspect | (| Bossier | Titus | Frankston | Texarkana | McCurtain | Belcher |
| | (| | Haley | | | Sanders | |
| Gibson | (| | | | | | |
| Aspect | (| Alto | Gahagan | | | Spiro | |

The above chart is the simplified preliminary scheme which was set up in 1943. Until 1941 a great quantity of WPA materials poured in and I could only spend a little while on the Caddoan material. I had met Webb and learned what he had been doing. Baerreis showed me the Spiro material in Norman. The WPA excavations at the Davis site provided the information on the Alto Focus. The Gahagan site was

described by Moore and by Webb and Dodd. The Sanders site was dug by Jackson. We had some material that I first called "Shelby" (now Bossier) Focus in central East Texas. Around Texarkana we had WPA excavations at the Hatchel site. Moore had illustrated materials to be found on the lower Arkansas and Ouachita rivers and several sites on Red River. All in all there were four or five properly excavated sites, a lot of surface collections, and a number of cemeteries excavated by Jackson, Woolsey, and amateurs, though many had been badly looted. After several years of working over this body of information, Webb and I agreed on the above outline of the Caddoan culture units, divided into two general aspects which were also time units.

As I said, this is a complex area in which relatively little work has been done, and every new job will produce new information and force revision of the old. The content of some foci has been modified and a few new ones have been added: Fort Coffee and Turkey Bluff in Oklahoma, by Orr and Lehmer respectively; and Mid-Ouachita in Arkansas by Webb and myself. Each of us working in the area has studied more material, testing this scheme to see how well it holds up and how it can be improved.

In Alto Focus there is no shell temper in 97,000 sherds. There is no brushing, no red filming, no effigy ware. At Gahagan, the few vessels and many associated artifacts are practically identical to Alto Focus—Copena knives, long-stemmed pipes, and so forth. At Spiro, one finds the same items. Webb and I suspected a long time ago that these three complexes were on the same time level, and they still seem to be.

On the other hand, the Southern Cult material at Spiro is not found at the Davis site except for one small piece of kaolin carved into a human head with "forked-eye" motif. The ceremonial material from Gahagan is not like that from Spiro. Hammered copper is found at Gahagan, but it is not like what is found at the Southern Cult centers. The Gahagan ceremonial material is quite distinctive, although it does have grooved stone earspools like Spiro.

The Sanders site had some Southern Cult material, plain and polished pottery, red filming, and no brushing.

At the Haley site we have ceremonial material not comparable to the Southern Cult, effigies, red filming, brushing, handles, and applique. Moore found two Sanders vessels at the Haley site, and a Haley Engraved bottle was found at the Sanders site.

Thus we get definite relationships from site to site, but differences also, justifying the setting up of separate foci. These Gibson Aspect foci provide a distinct contrast to those of the Fulton Aspect.

We have been reasonably satisfied with these foci as taxonomic units; but dating them is another matter. The typological relationships are supplemented by little good stratigraphic evidence.

The Hatchel mound was one site with good stratigraphic superposition: a temple mound with Haley Focus material, later covered with a Texarkana Focus mantle. The Belcher mound had four superimposed strata: Haley Focus at the bottom, one stratum of Bossier, and then two Belcher Focus strata at the top.

At Spiro, the WPA did not get clear stratigraphic information, although the information was probably there. When Orr analyzed the material, he had a difficult problem: the information was not in good shape, notes had been lost, and so forth. Orr set up a grave sequence based on the depth of the graves from the top of the mound. This is not the proper basis on which to set up a sequence in a site like Spiro. For instance, at Gahagan, Haley, and Crenshaw, which are similar sites, there were very deep graves—at Haley they were 16 to 17 feet deep—as well as cases of later graves dug down through the earlier ones. Thus establishing a grave sequence on the basis of depth in this sort of site is not very trustworthy.

At the Crenshaw site, Lemley and Dickinson described two cultures which they called "Caddo" and "pre-Caddo." The "pre-Caddo" represented the Coles Creek culture. Some years later, Webb and I looked over the material and realized that the "Caddo" material seemed to belong to three different complexes. Also not all of what they called Coles Creek really belonged to that complex. It would be very valuable if someone would re-analyze the Crenshaw material. There are probably four occupations there. If the materials were re-analyzed grave by grave we could probably relate them to Coles Creek, Haley, Texarkana, and Belcher Foci. For that matter, a great deal of the material which has been dug elsewhere could stand re-analysis, grave by grave. Our initial scheme still seems to work, but it stands to reason that an initial classification must eventually be revised.

Jelks: In an earlier discussion, evidence was presented regarding ceramic materials earlier than Gibson Aspect, from the southern end to the northern end of the Caddoan Area. So we might put something on the chart—a question mark—earlier than Gibson Aspect.

Griffin: There is the question of the relevance of certain Fourche Maline elements to this problem. *Jelks*: And also the Yarbrough and related sites, and the Alto-like sites on the Neches. There is no fancy pottery in these sites; they are just small sites with simple pottery.

Webb:* We originally thought that the Bossier Focus fit between Haley and Belcher Focus. Now there seems to be some overlap. For example, Belcher Focus is quite limited in Louisiana, probably having come down the Red River into a large area of Bossier sites; late Bossier sites may well be *contemporaneous* with Belcher, even conceivably lasting to historic times. Early Bossier may overlap late Haley, although the available evidence at that end is nebulous as yet.

Bossier Focus is *most* interesting. It is widespread—from the Ouachita River near Camden, Arkansas, across to East Texas, where it was originally called “Shelby Focus.” There is some regional variation in the percentage of pottery types, but in general the sites are similar. Our knowledge is mainly from surface collections. I have reworked surface collections from a number of sites in northern Louisiana, grouping the sites depending on the relative totals of six distinctive Bossier pottery types. These types are Maddox Engraved, Belcher Ridged, Sinner Linear Punctated, Pease Brushed-Incised, and two brushed wares—Karnack Brushed-Incised and Maddox Brushed, the latter apparently identical with Plaquemine Brushed. Twenty sites, with 100–1000 decorated sherds each, seem to fall into three groups. In *Early Bossier*, with 12 to 27% of the sherds being of definite Bossier types, there is a significant percentage of unmistakable Alto (6–14%) and Coles Creek (1–8%) sherds, and a very little Haley Focus pottery. There are a few Marksville and Troyville sherds. In *Middle Bossier*, Coles Creek and Alto Focus pottery disappears almost entirely and Plaquemine types appear. About 50% of the pottery is of distinct Bossier types. In *Late Bossier*, the distinct Bossier types constitute about 75% of the pottery; and this is fully developed Bossier Focus. Belcher Focus types begin to appear. A little shell tempering appears—less than 1%.

At the Belcher Mound site, there were four distinct levels. The Pre-Mound level is Haley-Alto; this is a common combination in northwestern Louisiana. We have recently obtained a radiocarbon date on this level from the Humble Laboratory, 1100 ± 100 years before the present [Sample 0-320]. The second level is Bossier Focus. The third and fourth levels are pure Belcher Focus, including “Southern Cult” items, the most striking of which is a serpent-eagle design engraved on shell. From the third (Belcher Focus) level we now have a radiocarbon date of 200 ± 100 years before the present [Sample No. 0-322]. Thus there is a long time-spread of 900 years, much of which may represent the period of Bossier development.

The Mineral Springs site in Arkansas, first reported by Harrington,

was formerly thought to be Spiro Focus. Now we have dug two additional deep burials. They seem to relate to the Alto, Haley, and Early Bossier and Texarkana Foci. A similar relationship between Gibson and Fulton probably applies at Crenshaw also.

One of the Mineral Springs burials that we dug, at Mound B, had almost pure Alto types: Hickory Fine Engraved, Crockett Curvilinear Incised, bowls with stepped designs; but there was also a vessel of Sinner Linear Punctated, which we have hitherto called a Bossier Focus type. There were long-stemmed pipes, greenstone celts, and a serrated kind of Alba projectile point, in this burial.

The other burial had pottery which we have called late Haley, Texarkana, Bossier, and early Belcher Focus. These vessel types include Haley Complicated Incised, Haley Engraved on a bottle, three or four bowls of Barkman or Glassell Engraved, two bowls of Hodges Engraved, several of Pease Brushed-Incised, two of Maddox Engraved, and one of Sinner Linear Punctated, all in one burial, with long-stemmed pipes and a cluster of Hayes points.

This new information certainly confuses our ideas on chronology. It seems to play hob with our standard sequence. We must have thorough excavation of some of these sites, so that we will not be dependent on burial wares alone; the burial wares have thrown us off too often and we need more extensive excavation to tie them in with everyday wares. In all likelihood the trouble is not that we have the wrong ideas on sequence, but that the types have longer duration in time than we have thought in the past.

Jones: What about the other types in some of these seemingly mixed situations? *Webb:* One gets Hardy Incised and pottery with zoned punctates (Rhinehart, Dupree) in the Bossier sites. These materials can't be related to any one focus in particular. Fingernail-punctated material—Wilkinson Punctated—is common in Early Bossier, less so in Middle Bossier, and is absent in Late Bossier. Brushed ware increases as one comes up in time.

Jelks: Perhaps it will help give direction to the discussion if we set up a chart on the board comparing various ideas on chronology.

[Jelks drew three columns, labeled "Webb," "Krieger," and "Radiocarbon;" and at the left, two headings, "Fulton" above and "Gibson" below. As soon as he began listing radiocarbon dates, the discussion centered around them and proceeded from there. The other columns were never filled.]

Discussion: Radiocarbon dates [Jelks at the board]:
Fulton Aspect: Belcher Focus, A.D. 1750 ± 100 (Belcher Mound)

Gibson Aspect: Alto-Haley, A.D. 858 ± 100 (Belcher Mound)

Spiro, 442 B.C.—A.D. 158 ± 500 (Spiro Site)

A.D. 1318 ± 250 to 1478 ± 250 (Spiro Site)

Alto Focus, A.D. 396 ± 175 (Davis Site)

Griffin and Ford: A.D. 858 is too early for Alto-Haley.

Griffin: Let me explain the situation regarding the Spiro dates, which were obtained at the Michigan laboratory.

442 B.C., 72 B.C., A.D. 158 These were all from the same specimen, a cedar log from the central chamber.

A.D. 1318 ± 250 This is from another log; the test was made later, when the laboratory was more mature. I think this is the most reliable date.

A.D. 1478 ± 250 This is from shell material collected at Spiro, and is less reliable.

We got dates of 2400 B.P. at the Angel site in Indiana. This dating, like that on the Davis site corn, was done by the carbon-black method, and is therefore less reliable.

Bell: From the Harlan site we have two dates, A.D. 678 ± 300 , and A.D. 1238 ± 200 . One is from charcoal in a house in the village. One is from the mound structure, charcoal from the middle of three floors. I cannot believe that the occupation took up a time span of this length. The nature of the debris and of the site speak for a very short occupation.

Krieger (to *Griffin*): The B.C. dates for Spiro are, of course, not possible. But I don't see how the radiochemist can explain them. How can dates come out falsely old—especially falsely old to the extent which you claim. *Griffin*: I don't know, but I believe it is happening. About all we can do is to wait and let more evidence straighten the matter out. *Ford*: The “plus-or-minuses” are very liberal here, and often overlap. We are taking these dates and probabilities much too seriously. After all, there is one chance in three that a specimen is older or younger than the stated error. *Bell*: Agreed; we lack enough consistent dates from any one site for confidence. We must have more runs from specific sites. *Ford*: Both of your Harlan site dates are too early anyhow!

Phillips: Earlier, *Krieger* put consistent dates on the board for Coles Creek and Troyville. The latest date was A.D. 1300. If you put Plaquemine on top of these Lower Mississippi Valley radiocarbon dates,

it is post-1300. The Southern Cult material in the Lower Valley is always in Plaquemine or later. There cannot be much time lag between Spiro, with its Cult material, and sites with Cult material in the Mississippi Valley; and that is why I like the 1300 date for Spiro.

Jelks: You want to correlate the entire Caddo sequence with Plaquemine. Types do change with time, even if by small increments; and the Caddoan types do change. I understand there are no recognizable differences within Plaquemine, in contrast to those in Caddoan. *Ford*: There are percentage differences with Plaquemine, as Cotter has shown. They are minor, however, and they are changes from site to site rather than in a direct stratigraphic sequence. And they are minor compared to the changes in the Caddoan Area. *Krieger*: * You people assume that the Southern Cult was everywhere the same. The Spiro Cult was very different from the later Cult expressions in Tennessee and Georgia, for example.

Webb: What was the date of the end of Marksville-Troyville? *Ford*: A.D. 700. *Webb*: This is a good beginning date for the Caddoan sequence; I have no objection to dating Caddoan beginnings at A.D. 700–800. There seem to be five sequential periods in the Caddoan sequence, at least four of them demonstrable by stratigraphy, and the total history could well have lasted 1200 years, especially since Bossier has as much change within it alone as Plaquemine does, in such matters as paste characteristics.

Webb. * These five sequential periods of Caddoan culture development along Red River and its tributaries are as diagrammed here [Fig. 6]. In the diagram, vertical arrows indicate stratigraphic demonstration in the sites indicated in parentheses. The only developmental step which is suggested by cultural content and collateral relationships but not proved by excavations is the suspected early Gibson-late Gibson situation (Coles Creek-Alto-Gahagan earlier than Haley-Sanders). Horizontal arrows indicate trade or traits held in common to demonstrate contemporaneity; this is only indicated when a significant number of traits are involved.

The transitional position of Bossier is indicated not only by the stratigraphic control in the excavations listed, but by the surface collection study previously reported; also by the carry-over of Bossier pottery types, from Haley sites and burials at one extreme to Belcher at the other extreme.

Coles Creek is included in the diagram because of the presence of Coles Creek pottery or characteristic Coles Creek sherds at Crenshaw

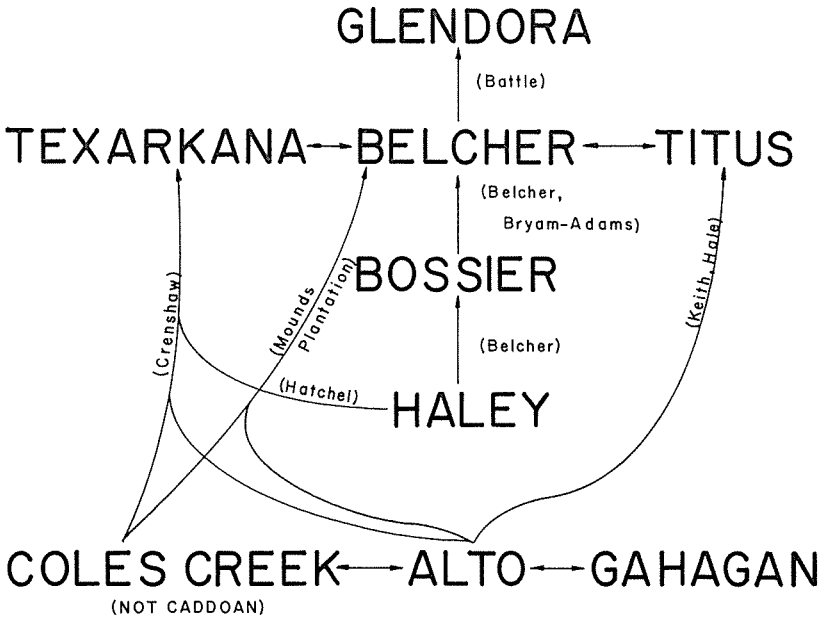


Fig. 6. Periods of Caddoan Culture Development.

and Mounds Plantation, in stratigraphic relationship with Caddoan pottery.

This Caddoan sequence could have begun at the end of Marksville-Troyville, whenever that date may be. There is no good date for the end of Gibson Aspect; there is no sharp break between the Gibson and Fulton aspects in northwestern Louisiana.

Jelks: At what point does Fulton Aspect become recognizable?
Webb: There is not enough information; it certainly is recognizable by Belcher-Texarkana-Titus times.

Ford: In the Alto Focus we have evidence of Marksville-Troyville and Coles Creek influence. *Webb:* Agreed. *Ford:* But in the Valley, there is no evidence of reverse influence—no evidence of Caddoan influence before the Plaquemine. An alternative suggestion, then, is that in the Caddoan area an explosive cultural situation was being developed similar to what happened to the Mississippi Pattern at the time of its formulation. While the Mississippian and Mexican traits were mixing in the Caddoan Area, cultural development could have been rapid, while in the Valley at the same time things could have been relatively static.

Plaquemine probably lasted 200 years. It began about A.D. 1300–1400, and has Natchez over it.

Webb: If you have pottery with incurving rims, a line on the lip, and subjacent triangles, would you accept it as Coles Creek? *Ford*: It depends on the paste. *Webb*: The paste varies from one site to another, and from one area to another, as seen at Crenshaw. *Phillips*: The line on the lip continued into Plaquemine and never did entirely die out.

[Krieger put on the board the same list of dates as earlier plus this additional column:]

| | |
|-----------------|--------------|
| | “Marksville” |
| A.D. 1050 ± 100 | |
| 900 ± 100 | |
| 792 ± 250 | |

Krieger: These dates seem to indicate that Troyville is older than Marksville. On the other hand, Hopewell dates and the Hopewell-Marksville relationship support the Marksville-Troyville sequence. *Ford*: I think that Marksville is about A.D. 300–500, later than northern Hopewell. *Phillips and Griffin*: It is not much later.

Krieger: The trouble is that if you accept the Midwestern Hopewell radiocarbon dates from about 400 B.C. to just after A.D. 1, then according to what is being argued here you have a thousand years to account for before Mississippian begins. You have to account for this great time interval. You must account for everything after Marksville-Hopewell and before Middle Mississippi. Why could not Troyville and temple mounds begin as early as A.D. 500? The carbon-14 dates we have here [on the chart] are reasonable and consistent.

Ford: This postulates a great wall between the Lower Mississippi and the Midwest.

Griffin: The Middle Mississippi goes back to A.D. 800–900. *Webb*’s date of 700–800 for the beginning of Gibson Aspect seems a little early. Gahagan is probably somewhat later than this. *Webb*: I agree that Gahagan correlates with Early Mississippi.

Krieger: You still have to account for everything after Marksville and before Middle Mississippi. If you call Plaquemine early Mississippi, as some of you do, you are leaving too great a gap. *Griffin*: I disagree; Plaquemine is late Mississippi. *Krieger*: * Then what is early Mississippi?

Phillips: I think a close time correlation is shown here between

Alto Focus and Spiro. No one has suggested anything wrong with the A.D. 1300 date for Spiro. How does one reconcile this with the claims of earlier dating for Alto and other Gibson Aspect foci?

Krieger: You cannot solve these problems in the Caddoan Area until you decide on the date of the origin of Mississippian. *Phillips*: I disagree; I don't even think that Plaquemine should be called Mississippian. I think Plaquemine derives from Coles Creek, and that Mississippian comes down from the north. *Ford*: We are having terminological trouble here. Names change their meanings, and the term "Mississippian" has changed its meaning. I don't think *Krieger* is taking this into account. *Krieger*: * How many others are aware of this change?

Jelks: You say there are Coles Creek influences showing at the Davis site, but not the other way. But if you equate Davis with Plaquemine, why don't you have two-way trade? Why don't you have Davis site traits showing in Plaquemine, and Plaquemine traits at the Davis site? *Ford*: You do.

Griffin: I think there were some things at the Davis site which are not part of the Alto Focus.

Ford: Davis Incised is Coles Creek derived.

Webb (to *Cotter*): At the Gordon site, Crockett and Maddox pottery were found in a pre-mound level. Does this represent Coles Creek or Plaquemine?

Cotter: *That was eight or nine years ago. I have left this area and now have trouble understanding this typology tangle. The Gordon site was originally thought of as the type site for Coles Creek. The oldest level we could find was Coles Creek, with circular houses. Only a few inches above this was the evidence of rectangular Plaquemine houses. The only clear separation was in the house types. The sherds were so mixed that it was only through typology that I could separate them. The most important information here was on how a continuum of people lived, and what, if anything, changes in house type and pottery decoration might mean.

It seems to me that we have neglected a basic economic study of these sites. If we start on a broader footing we can see how trade, ecology, and design types interrelate. Begin with the economic picture, and then the rest will make a more connected pattern.

Krieger: We must decide what the Mississippi Pattern is before the

Caddo problem can be solved. Griffin has correlated both "early" and "late" Mississippi only with Temple Mound II. I think Temple Mound I is the beginning of the Mississippi. If not, you must do something terminologically with the complexes in Louisiana which you do not call either Woodland or Mississippi.

Phillips: The "Temple Mound" terminology has outlived its usefulness. Why does the Coles Creek-Plaquemine continuity have to be "Mississippi" or "Woodland" or anything else but Coles Creek-Plaquemine? We should not start by formulating the basic patterns in the area and then try to fit everything into them.

Krieger: In your book with Willey [Willey and Phillips, 1958] you now call "Mississippi" what formerly was "Middle Mississippi."

Phillips: Right. *Krieger*: The four-stage Burial Mound-Temple Mound terminology was a good idea in 1941, is still useful now, and should not be dropped. *Ford*: The Mississippi culture proper did not develop until about A.D. 1200-1300. Like the Caddoan, it was a sudden recombination of traits from various sources. *Krieger*: Then you have temple mounds all over the place which are not Mississippi. *Phillips and Ford*: Certainly; there is no need to equate temple mounds one-for-one with Mississippi. *Krieger*: But you should make it clear what you are talking about; we must be sure we are talking the same language. If you say that Temple Mound II equals Mississippi, then there are Temple-Mound-I's all over the place with no designation. *Cotter*: Poverty Point, a temple mound, and Hopewell, a burial mound, have no chronological relationship. We are starting in mid-air until we first go into the economic patterns. [Phillips, Griffin, Cotter, and Ford in additional comments to one another seem to feel that this discussion is a relatively futile argument over terms.]

Stephenson: Isn't Krieger simply trying to get a name for each of these situations? A name, for instance, for Temple Mound I? *Krieger*: In the literature, including Griffin's *Archeology of Eastern United States* [Griffin, 1952], everything in the East is being divided into either Woodland or Mississippi. *Ford*: No, not any longer. That was Cole's and Deuel's pioneering attempt, and was all right years ago, but not any longer. We have long since given up such neat divisions of all eastern archeology. It's a mixed-up mess now, but we like it. [Phillips concurs.]

Krieger: What are you going to call this Coles Creek-Plaquemine continuity? *Ford*: Call it the Gulf Tradition if you like, as Willey did.

Jelks: How does this discussion relate to the Caddoan Area?

Krieger: Gibson Aspect and Fulton Aspect have temple mounds. The A.D. 510 radiocarbon date in our list applies to Temple Mound I in Troyville and to the introduction of temple mounds in the United States. Gibson Aspect is Temple Mound I; Fulton Aspect is Temple Mound II. *Ford:* This is not right; the Temple Mound I and II classification was not a chronological device.

Baerreis: We are still arguing the same old questions as years ago. We are neglecting some of our tools. Krieger showed us the use of vessel shapes for comparisons. Ford did similarly with design elements, but did not extend his detailed comparisons into the Caddoan Area. We need to find other horizon markers, such as ear-spool types, to tie in different areas such as the Lower Mississippi and the Caddoan Area. A particular bottle shape may turn out to be a good time marker. Although there are not many trade objects, the people were copying one another's vessel forms, as Krieger showed between the Southeast and Southwest.

Webb: Ford said that bottles were late in the Mississippi Valley. What did the Caddo use bottles for? Not to haul water. Possibly they had some ceremonial use, since they make up such a large proportion of Caddo graves. This might give us an idea as to why bottles are late in the Mississippi Valley; perhaps there was a particular ceremonial tradition which did not penetrate central Louisiana until Plaquemine times. There must be some reason why other Caddo vessel forms appear in central Louisiana before bottles do.

*Krieger:** Archeologists are making a mistake when they regard diffusion as an automatic process. There seems to be ample evidence here that diffusion of many traits between the Caddo and lower Mississippi Valley, in both directions, was delayed or blocked by ethnic, cultural, or psychological attitudes—whatever we should call them—during a substantial part of the time we are considering. Such “blocks” would appear to have been stronger during Troyville and Coles Creek than during Plaquemine times. The so-called “trade” relationships might also be regarded as occasional intermarriages which can, of course, occur between tribes who do not care particularly for one another. In any case, these factors might be considered in future research.

[This was the end of the final discussion of the Conference. The

Symposium on Relationship of the Caddoan Area with Neighboring Areas, which is presented earlier in this volume, took place the following day.]

References Cited

- Bell, Robert E., and David A. Baerreis
 1951. A Survey of Oklahoma Archeology. Bulletin of the Texas Archeological and Paleontological Society, Vol. 22, pp. 7-100.
- Davis, E. Mott, editor
 1961. Proceedings of the Fourth Conference on Caddoan Archeology. Bulletin of the Texas Archaeological Society, Vol. 30 (for 1959), pp. 1-33.
- Ford, James A.
 1936. Analysis of Indian Village Site Collections from Louisiana and Mississippi. Anthropological Study No. 2, Department of Conservation, Louisiana Geological Survey.
- Ford, James A., and Clarence H. Webb
 1956. Poverty Point, a Late Archaic Site in Louisiana. Anthropological Papers of the American Museum of Natural History, Vol. 26, Part 1.
- Griffin, James B., editor
 1952. Archeology of Eastern United States. University of Chicago Press, Chicago.
- Griffith, William Joyce
 1954. The Hasinai Indians of East Texas as Seen by Europeans, 1687-1772. Philological and Documentary Studies, Vol. 2, No. 3, pp. 41-168. Middle American Research Institute, Tulane University.
- Harris, R. K.
 1953. The Sam Kaufman Site, Red River County, Texas. Bulletin of the Texas Archeological Society, Vol. 24, pp. 43-68.
- Krieger, Alex D.
 1946. Culture Complexes and Chronology in Northern Texas. University of Texas Publication No. 4640.
 1947. The First Symposium on the Caddoan Archaeological Area. American Antiquity, Vol. 12, No. 2, pp. 198-207.
- Moore, Clarence B.
 1908. Certain Mounds of Arkansas and Mississippi. Journal of the Academy of Natural Sciences of Philadelphia, Vol. 13, Part 4, pp. 481-557.
 1909. Antiquities of the Ouachita Valley. *Ibid.*, Vol. 14, pp. 1-170.
- Orr, Kenneth G.
 1952. Survey of Caddoan Area Archeology. In Griffin, 1952, pp. 239-255.
- Phillips, Philip, James A. Ford, and James B. Griffin
 1951. Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940-1947. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 25.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
 1954. An Introductory Handbook of Texas Archeology. Bulletin of the Texas Archeological Society, Vol. 25.

Swanton, John R.

- 1942. Source Material on the History and Ethnology of the Caddo Indians. Bureau of American Ethnology. Bulletin 132.
- 1952. The Indian Tribes of North America. Bureau of American Ethnology, Bulletin 145.

Walker, W. M.

- 1935. A Caddo Burial Site at Natchitoches, Louisiana. Smithsonian Miscellaneous Collections, Vol. 94, No. 14.

Webb, Clarence H.

- 1945. A Second Historic Caddo Site at Natchitoches, Louisiana. Bulletin of the Texas Archeological and Paleontological Society, Vol. 16, pp. 52-83.
- 1960. A Review of Northeast Texas Archeology. Bulletin of the Texas Archeological Society, Vol. 29 (for 1958), pp. 35-62.

Webb, Clarence H., and Monroe Dodd, Jr.

- 1939. Further Excavations at the Gahagan Mound; Connections with a Florida Culture. Bulletin of the Texas Archeological and Paleontological Society, Vol. 11, pp. 92-128.

Wilford, Lloyd A.

- 1955. A Revised Classification of the Prehistoric Cultures of Minnesota. American Antiquity, Vol. 21, No. 2, pp. 130-142.

Wiley, Gordon R., and Philip Phillips

- 1958. Method and Theory in American Archaeology. University of Chicago Press, Chicago.

Williams, Stephen

- 1955. The Aboriginal Location of the Kadohadacho and Related Indian Tribes. Report prepared for the Indian Claims Commission.
- 1960. Review of Clarence H. Webb, *The Belcher Mound*. American Journal of Archaeology, Vol. 64, pp. 304-305.

The University of Texas
Austin, Texas

Caddoan Radiocarbon Dates

Compiled and edited by

T. N. CAMPBELL

At present there are 21 published radiocarbon dates from Caddoan archeological sites, nearly all being dates from components or sites attributed to the Gibson Aspect. Nine different sites are involved, seven in Oklahoma (Spiro, Brackett, Harlan, Hughes, Norman, Reed, and McCarter), one in Louisiana (Belcher), and one in Texas (Davis). For individual sites the number of datings is usually small—one date each from Brackett, Reed, McCarter, and Davis, and two dates each from Belcher, Harlan, Hughes, and Norman. There are, however, nine dates from Spiro, but five of these are not currently accepted as reliable. As the literature on these radiocarbon dates is scattered, it is believed that a list of the dates and citation of the pertinent literature will be useful to workers in the Caddoan and adjoining areas.

The age determinations given below are presented site by site, the order of sites and dates for each being based on successively older datings. 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) datings 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) publications that interpret and evaluate the dates.

BELCHER SITE, CADDO PARISH, LOUISIANA

O-322 (Humble)

Sample Provenience: Charcoal from House 7, Primary Mound A. Belcher III, Belcher Focus, Fulton Aspect.

Dating: 200 ± 100 years ago, or A.D. 1758 ± 100.

TABLE 1

Summary List of Caddoan Radiocarbon Dates

| <i>Sites</i> | <i>Dates</i> | |
|--------------------------------|------------------|-----------------|
| | <i>Years Ago</i> | <i>Calendar</i> |
| <i>Belcher Site, Louisiana</i> | | |
| O-322 (Fulton Aspect) | 200 ± 100 | A.D. 1758 ± 100 |
| O-320 (Gibson Aspect) | 1100 ± 100 | A.D. 858 ± 100 |
| <i>Spiro Site, Oklahoma</i> | | |
| M-309 (Gibson Aspect) | 480 ± 200 | A.D. 1479 ± 200 |
| O-596 (Gibson Aspect) | 500 ± 100 | A.D. 1458 ± 100 |
| M-54 (Gibson Aspect) | 640 ± 250 | A.D. 1316 ± 250 |
| M-816 (Gibson Aspect) | 1170 ± 150 | A.D. 790 ± 150 |
| M-14 (Gibson Aspect) | 1800 ± 400 | A.D. 156 ± 400 |
| Series of five dates | 2030 ± 500 | 74 ± 500 B.C. |
| | 2400 ± 400 | 444 ± 400 B.C. |
| | 2500 ± 400 | 544 ± 400 B.C. |
| | 2700 ± 400 | 744 ± 400 B.C. |
| <i>Brackett Site, Oklahoma</i> | | |
| O-606 (Gibson Aspect) | 700 ± 100 | A.D. 1258 ± 100 |
| <i>Harlan Site, Oklahoma</i> | | |
| M-65 (Gibson Aspect) | 720 ± 200 | A.D. 1238 ± 200 |
| M-64 (Gibson Aspect) | 1280 ± 300 | A.D. 678 ± 300 |
| <i>Hughes Site, Oklahoma</i> | | |
| O-594 (Gibson Aspect) | 875 ± 100 | A.D. 1083 ± 100 |
| M-817 (Gibson Aspect) | 1050 ± 150 | A.D. 910 ± 150 |
| <i>Norman Site, Oklahoma</i> | | |
| O-595 (Gibson Aspect) | 1000 ± 100 | A.D. 958 ± 100 |
| M-818 (Gibson Aspect) | 1050 ± 150 | A.D. 910 ± 150 |
| <i>Reed Site, Oklahoma</i> | | |
| M-819 (Gibson Aspect) | 1100 ± 150 | A.D. 860 ± 150 |
| <i>McCarter Site, Oklahoma</i> | | |
| No number (Gibson Aspect?) | 1160 ± 100 | A.D. 798 ± 100 |
| <i>Davis Site, Texas</i> | | |
| C-153 (Gibson Aspect) | 1553 ± 175 | A.D. 398 ± 175 |

References:

Published date lists: None; announced by Webb, 1959.

Archeological evaluations: Davis, 1961; Webb, 1959, 1961.

O-320 (Humble)

Sample Provenience: Charcoal from House 4, pre-mound level beneath Mound B. Belcher I, Gibson Aspect.

Dating: 1100 ± 100 years ago, or A.D. 858 ± 100.

References:

Published date lists: None; announced by Webb, 1959.

Archeological evaluations: Davis, 1961; Krieger, 1961; Webb, 1959, 1961.

SPIRO SITE, LEFLORE COUNTY, OKLAHOMA

M-309 (Michigan)

Sample Provenience: Conch shell believed to have come from the large cache of marine shells found in Craig Mound. Spiro Focus, Gibson Aspect.

Dating: 480 ± 200 years ago, or A.D. 1479 ± 200 .

References:

Published date lists: Bell, 1961; Crane and Griffin, 1959.

Archeological evaluations: Bell, 1957; Davis, 1961.

O-596 (Humble)

Sample Provenience: Fragments of juniper wood from central tomb of Craig Mound. Same wood as Sample M-54 (Michigan). Spiro Focus, Gibson Aspect.

Dating: 500 ± 100 years ago, or A.D. 1458 ± 100 .

References:

Published date lists: Bell, 1958, 1961.

Archeological evaluations: Davis, 1961.

M-54 (Michigan)

Sample Provenience: Fragments of juniper wood from central tomb of Craig Mound. Same wood as Sample O-596 (Humble). Spiro Focus, Gibson Aspect.

Dating: 640 ± 250 years ago, or A.D. 1316 ± 250 .

References:

Published date lists: Bell, 1961; Crane, 1956.

Archeological evaluations: Bell, 1955, 1957; Crane and Griffin, 1959 (see M-309); Davis, 1961.

M-816 (Michigan)

Sample Provenience: Charcoal from burned area in basal part of Craig Mound, located in the "saddle section" just north of the central ceremonial chamber. Believed to represent Early or Middle Spiro of Orr's sequence. Spiro Focus, Gibson Aspect.

Dating: 1170 ± 150 years ago, or A.D. 790 ± 150 .

References:

Published date lists: Bell, 1959, 1961; Crane and Griffin, 1960.

Archeological evaluations: Davis, 1961; Krieger, 1961.

M-14 (Michigan)

Sample Provenience: Juniper wood from central tomb of the Craig Mound. Spiro Focus, Gibson Aspect.

Datings: Series of five dates.

1800 ± 400 years ago, or A.D. 156 ± 400

2030 ± 500 years ago, or 74 ± 500 B.C.

2400 ± 400 years ago, or 444 ± 400 B.C.

2500 ± 400 years ago, or 544 ± 400 B.C.

2700 ± 400 years ago, or 744 ± 400 B.C.

These dates, according to Crane and Griffin (1959), are now regarded as "absurdly high." They were obtained by the carbon-black method; later age determinations by gas counter were consistently lower (see other datings from Spiro Site).

References:

Published date lists: Bell, 1961; Crane, 1956.

Archeological evaluations: Bell, 1955, 1957; Crane and Griffin, 1959 (see M-309); Davis, 1961; Suhm *et al.*, 1954.

BRACKETT SITE, CHEROKEE COUNTY, OKLAHOMA

O-606 (Humble)

Sample Provenience: Charcoal fragments from Test Pit 4. Gibson Aspect.

Dating: 700 ± 100 years ago, or A.D. 1258 ± 100.

References:

Published date lists: Bell, 1958, 1961.

HARLAN SITE, CHEROKEE COUNTY, OKLAHOMA

M-65 (Michigan)

Sample Provenience: Charcoal from House No. 3, Test Area 4. Gibson Aspect.

Dating: 720 ± 200 years ago, or A.D. 1238 ± 200.

References:

Published date lists: Bell, 1958, 1961; Crane and Griffin, 1958.

Archeological evaluation: Bell, 1956b.

M-64 (Michigan)

Sample Provenience: Charcoal from house, Unit 4, Level 4. Gibson Aspect.

Dating: 1280 ± 300 years ago, or A.D. 678 ± 300.

References:

Published date lists: Bell, 1958, 1961; Crane and Griffin, 1958.

Archeological evaluations: Bell, 1956a, 1956b.

HUGHES SITE, MUSKOGEE COUNTY, OKLAHOMA

O-594 (Humble)

Sample Provenience: Charcoal fragments from floor of House No. 8.
Gibson Aspect.

Dating: 875 \pm 100 years ago, or A.D. 1083 \pm 100.

References:

Published date lists: Bell, 1958, 1961.

M-817 (Michigan)

Sample Provenience: Charcoal from post in House No. 3. Gibson Aspect.

Dating: 1050 \pm 150 years ago, or A.D. 910 \pm 150.

References:

Published date lists: Bell, 1959, 1961; Crane and Griffin, 1960.

Archeological evaluation: Krieger, 1961.

NORMAN SITE, WAGONER COUNTY, OKLAHOMA

O-595 (Humble)

Sample Provenience: Charcoal fragments from House No. 3-1. Gibson Aspect.

Dating: 1000 \pm 100 years ago, or A.D. 958 \pm 100.

References:

Published date lists: Bell, 1958, 1961.

M-818 (Michigan)

Sample Provenience: Charcoal from Mound Unit 1A, second substage below surface. Gibson Aspect.

Dating: 1050 \pm 150 years ago, or A.D. 910 \pm 150.

References:

Published date lists: Bell, 1959, 1961; Crane and Griffin, 1960.

Archeological evaluation: Krieger, 1961.

REED SITE, DELAWARE COUNTY, OKLAHOMA

M-819 (Michigan)

Sample Provenience: Charcoal from northern side of south house, about 14 inches below surface. Gibson Aspect.

Dating: 1100 \pm 150 years ago, or A.D. 860 \pm 150.

References:

Published date lists: Bell, 1959, 1961; Crane and Griffin, 1960.

Archeological evaluation: Krieger, 1961.

McCARTER SITE, MUSKOGEE COUNTY, OKLAHOMA

O-398 (*Humble*)

Sample Provenience: Log found above the Archaic occupation and immediately below topsoil containing potsherds attributed to Gibson Aspect. May be late Archaic or early Gibson Aspect.

Dating: 1160 ± 100 years ago, or A.D. 798 ± 100 .

References:

Published date lists: Bell, 1961.

Archeological evaluations: Bell, 1961; Shaeffer, 1958.

DAVIS SITE, CHEROKEE COUNTY, TEXAS

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. Phase 1 of Alto Focus occupation, Gibson Aspect.

Dating: 1553 ± 175 years ago, or A.D. 398 ± 175 .

References:

Published date lists: Campbell, 1961; Griffin, 1952; Johnson, 1951; Libby, 1951, 1955.

Archeological evaluations: Davis, 1961; Griffin, 1952; Krieger, 1951, 1952; Suhm *et al.*, 1954; Willey and Phillips, 1958.

References Cited

Bell, Robert E.

- 1955. Radiocarbon Dates for Wood Specimens from the Spiro Mound, Oklahoma. Oklahoma Anthropological Society Newsletter, Vol. 4, No. 1, p. 2.
- 1956a. Radiocarbon Date from the Harlan Site, Cherokee County, Oklahoma. Oklahoma Anthropological Society Newsletter, Vol. 5, No. 3, p. 6.
- 1956b. Radiocarbon Dates from the Harlan Site, Cherokee County, Oklahoma. Oklahoma Anthropological Society Newsletter, Vol. 6, No. 6, p. 2.
- 1957. Radiocarbon Date from the Spiro (Craig) Mound. Oklahoma Anthropological Society Newsletter, Vol. 6, No. 6, pp. 5-6.
- 1958. Radiocarbon Dates from Oklahoma. Oklahoma Anthropological Society Newsletter, Vol. 7, No. 3, pp. 3-4.
- 1959. Radiocarbon Dates from Oklahoma Sites. Oklahoma Anthropological Society Newsletter, Vol. 8, No. 4, p. 2.
- 1961. Radiocarbon Dates from Archaeological Sites in Oklahoma. Bulletin of the Oklahoma Anthropological Society, Vol. 9, pp. 77-80.

Campbell, T. N.

- 1961. A List of Radiocarbon Dates from Archeological Sites in Texas. Bulletin of the Texas Archeological Society, Vol. 30 (for 1959), pp. 311-320.

Crane, H. R.

- 1956. University of Michigan Radiocarbon Dates I. Science, Vol. 124, No. 3224, pp. 664-672.

- Crane, H. R., and James B. Griffin
1958. University of Michigan Radiocarbon Dates III. *Science*, Vol. 128, No. 3332, pp. 1117-1123.
1959. University of Michigan Radiocarbon Dates IV. *American Journal of Science Radiocarbon Supplement*, Vol. 1, pp. 173-198.
1960. University of Michigan Radiocarbon Dates V. *American Journal of Science Radiocarbon Supplement*, Vol. 2, pp. 31-48.
- Davis, E. Mott
1961. Proceedings of the Fifth Conference on Caddoan Archeology. *Bulletin of the Texas Archeological Society*, Vol. 31 (for 1960).
- Griffin, James B.
1952. Radiocarbon Dates for the Eastern United States. In: James B. Griffin (editor), *Archeology of Eastern United States*, pp. 365-370. University of Chicago Press. Chicago.
- Johnson, Frederick (editor)
1951. Radiocarbon Dating. *Memoirs of the Society for American Archaeology*, No. 8.
- Krieger, Alex D.
1951. A Radiocarbon Date on the Davis Site in East Texas. *American Antiquity*, Vol. 17, No. 2, pp. 144-145.
1952. Review: James A. Ford, Greenhouse: A Troyville-Coles Creek Period Site in Avoyelles Parish, Louisiana. *American Antiquity*, Vol. 18, No. 2, pp. 175-179.
1961. Discussion of: James B. Griffin, Relations between the Caddoan Area and the Mississippi Valley. *Bulletin of the Texas Archeological Society*, Vol. 31 (for 1960).
- Libby, W. F.
1951. Radiocarbon Dates, II. *Science*, Vol. 114, No. 2960, pp. 291-296.
1955. Radiocarbon Dating. Second edition. University of Chicago Press. Chicago.
- Shaeffer, James B.
1958. Summer Activities of the Highway Salvage Project. *Oklahoma Anthropological Society Newsletter*, Vol. 7, No. 4, p. 7.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
1954. An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 25.
- Webb, Clarence H.
1959. The Belcher Mound: A Stratified Caddoan Site in Caddo Parish, Louisiana. *Memoirs of the Society for American Archaeology*, No. 16.
1961. Relationships between the Caddoan and Central Louisiana Sequences. *Bulletin of the Texas Archeological Society*, Vol. 31 (for 1960).
- Wiley, Gordon R., and Philip Phillips
1958. Method and Theory in American Archaeology. University of Chicago Press, Chicago.

The University of Texas
Austin, Texas

An Archeological Reconnaissance Behind the Diablo Dam, Coahuila, Mexico

WALTER W. TAYLOR AND FRANCISCO GONZALEZ RUL

In the winter of 1958, as part of a coordinated effort by Mexican and United States agencies, the archeological reconnaissance to be reported here was conducted along the Rio Grande and its tributary canyons, in the State of Coahuila, Mexico. The area of investigation was that which will be flooded by the proposed Diablo International Dam, now re-named the Friendship International Dam, to be constructed immediately below the point at which the Devils River enters the Rio Grande (Fig. 1). The reservoir thus created is to have an extension of some 75 miles (125 km.) along the main river and a flood-pool elevation of 1140.4 feet (347 m.) above sea level. Our task was to assess the archeological resources of this area and to make recommendations for a program of salvage which would preserve the important cultural and historical heritage about to be physically destroyed by the rising waters. We were also directed to take note of remains which might lie above the flood-pool but which will be in danger of the vandalism inevitably to follow the opening of this heretofore virtually inaccessible and quite unexplored region.

Early in January, the authors of the present report were commissioned by the National Institute of Anthropology and History of Mexico: Taylor as Director charged with the planning and direction of the work and with coordinating investigations on our side with those on the United States side, and Rul as Inspector charged with the actual field operations and the later study and analysis of the collections. The following report, then, is a composite one: the empirical data and analysis coming largely from Rul and the synthesis from both of us.¹

¹ The substantive details of this report have been abstracted from the thesis submitted by co-author Rul in partial fulfillment of the requirements for his professional degree in archaeology from the Escuela Nacional de Antropología e Historia. We wish to thank the authorities of the Instituto Nacional de Antropología e Historia for permission to publish these data. For a brief, preliminary account of this work, see Taylor, 1958: 87-89.

Soon after being commissioned, Taylor went to Del Rio, Texas, to meet with those in charge of operations on the United States side. In addition to making plans and preparations, it was possible to make a brief aerial flight over the region of our future work. This short trip and a subsequent longer one were a revelation as to the value of aerial survey: such preliminary flights can save many a harsh day of foot travel, much time and, prosaically, much money. It is amazing what sites can be located using topographic maps and a pilot who will fly "low and slow." A comparably broad over-view of human occupation and its relation to the natural landscape can be had in no other way.²

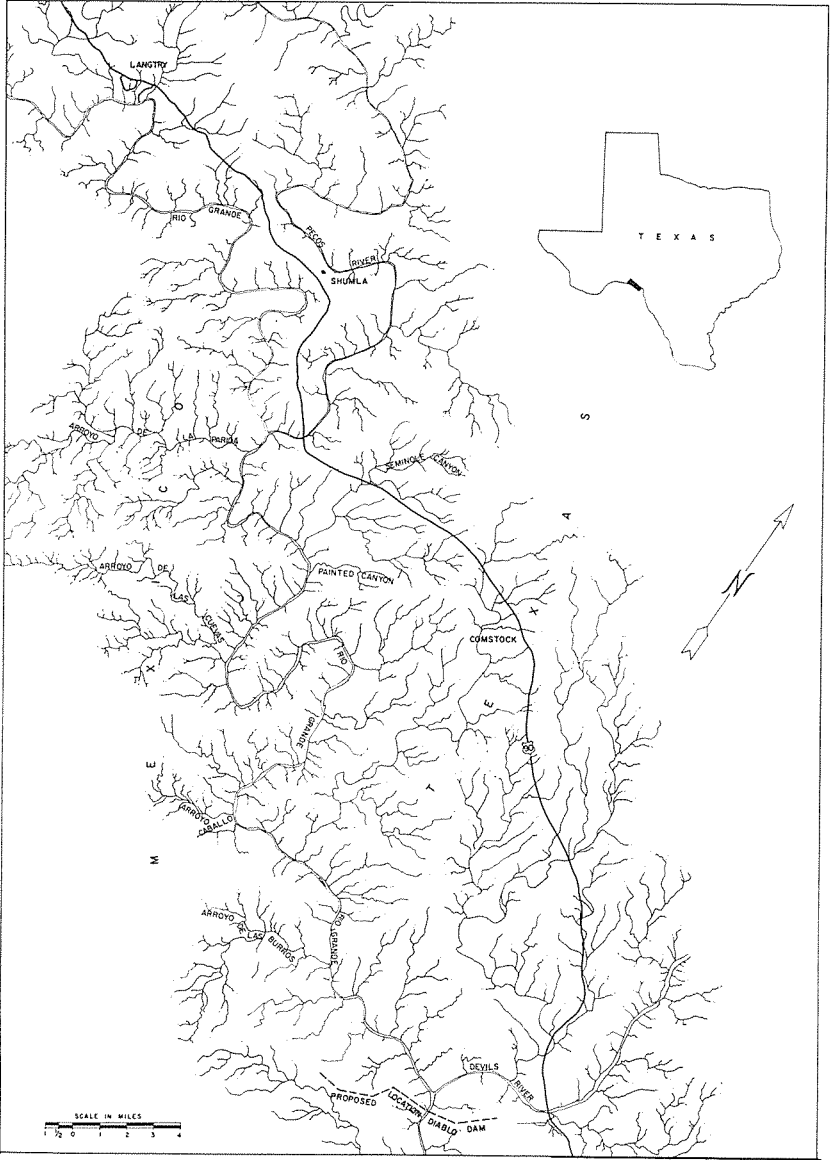
By the end of January, both of us were in Coahuila, and fieldwork started on 3 February. Taylor worked for 11 days and then returned to Mexico City. Rul continued alone, except for a hired assistant, until 26 March, at which time Taylor returned in order to visit the more important sites preparatory to making final recommendations for excavation and other salvage. All work terminated on 30 March.³

In the area of our survey, the Rio Grande and its tributaries flow through nearly horizontal beds of Cretaceous limestone. The greater volume of water and the perennial nature of the stream have caused the Rio Grande to entrench itself more rapidly than its intermittent tributaries. The result has been that the tributaries break into the main canyon at elevations considerably above the present stream, forming, below their hanging mouths, an almost unbroken line of cliffs which isolate the Rio Grande and its flood plain from the tributary canyon systems and from the uplands from which they emerge. Only perennial streams and a few broad, shallow arroyos enter the Rio Grande at water level. But on the Mexican side, there are no perennial streams and but few arroyos of sufficient size to have kept pace with the entrenchment of the main stream. These geological facts have had important effects upon aboriginal life in this region.

Available water supply has probably also been an important factor

² We wish to thank Edward B. Jelks, of the U. S. National Park Service, for help and advice in regard to these aerial survey flights and for other courtesies in regard to the coordination of our two projects (Graham and Davis, 1958: 8).

³ We wish to thank John Allen Graham and his parents, Mr. and Mrs. Thomas Graham, of Del Rio, Texas, for their many kindnesses and their considerable help in furthering our work. We also wish to thank Sr. don Valeriano Diego, and his sons, owner and heirs, respectively, of the Rancho Santa Rosa on which our work was largely concentrated, for their most generous hospitality during our stay on their lands. We also wish to thank Sr. don Juan Quiroz, owner of the Rancho La Chuparrosa, for his kind permission to work on his lands and to use the facilities of the ranch itself.



GENERAL AREA OF PROPOSED DIABLO RESERVOIR
COAHUILA, MEXICO — TEXAS, U.S.A.

Fig. 1.

in the aboriginal occupation. For both the Mexican and United States sides, the Rio Grande itself is a constant, its waters being equally available or, perhaps better, unavailable because of the line of unscalable cliffs. Although exact statement is impossible, it is probable that there is equality also in the number of *tinajas*, natural potholes in the bedrock, in which rainwater collects and endures sometimes from year to year. However, when it comes to "live" water, either in the form of perennial streams or springs, the difference is great and easily stated: there is no live water on the Mexican side. On the United States side, in contrast, there are two perennial tributaries (the Pecos and the Devils River), a considerable number of small springs along these two water courses, and two extremely large springs which provide great quantities of localized but never-failing water at Comstock and Del Rio, Texas.

Climatologically, the area is semiarid, having an annual rainfall averaging about 15 inches (405 mm.) which falls mostly in the summer. Apart from the flood plain of the Rio Grande, which supports a dense growth of cottonwood, willow, cane, and grass, the vegetation is sparse and has been designated by Bray (1905) as that of "the sotol country." Animal life, while probably never either varied or abundant, was evidently enough in the past to provide a modicum of food and basic materials to the aborigines. Of course, both flora and fauna have changed through the years, and paleobotanical and paleoclimatological studies have demonstrated that from the times of the earliest human occupation the climate and biota have deteriorated, making the present conditions probably the least hospitable of any (Johnson, 1960: 169-70; W. W. Taylor, 1956: 224).

However, it should be pointed out most emphatically that, for people accustomed to subsist largely upon coarse plant foods, the region, far from being an area of scarcity, is really one of considerable abundance. If we look upon the situation objectively, and not from our own ethno-dietary point of view, and if we remember that human tastes are matters of custom derived at least in part from necessity and availability, then we must admit that arid lands such as these are not wastes with respect to human subsistence. They often can be made to provide a living, such as it may seem to us, that is abundant and sometimes a lot easier to come by than that in the more humid regions where we might choose to live. In other words, if one has grown up eating desert food, the desert has a lot of it to offer. One is reminded of the old cowboy story about the hungry hired hand who said after his first meal at the ranch: "That sure was good food, m'am . . . what there was of it. I mean there was a lot of it, m'am . . . such as it was."

Sites

Our survey recorded 68 numbered sites and five general localities in which no habitations were found but from which artifacts were collected. These sites are grouped and quantified in Table 1.

TABLE 1

| | <i>Number</i> | <i>Percentage</i> |
|--|---------------|-------------------|
| Open sites (rock middens or "mezcaleros") | 16 | 24 |
| Rockshelters | | |
| Large | 4 | 6 |
| Medium | 12 | 18 |
| Small | 10 | 15 |
| Small and without sign of human occupation | 11 | 16 |
| Unclassified | 14 | 21 |
| Pictograph site | 1 | .. |
| Totals | 68 | 100 |

In regard to size, it should be stated that the designations "large," "medium," and "small" cannot be equated with the same designations in the report on the United States side (Graham and Davis, 1958: 39-74); our large and medium sites are not nearly as big as the ones so designated on the other side. For example, on the Mexican side the widths at the mouths of the "large" sites range from 81 to 113 feet, while on the other side they run from 170 to 500; depths range from 26 to 97 feet on the Mexican side, from 40 to 140 on the other. On the other hand, the small ones are of about equal size. Compared to the United States side, there is little vandalism evident in the sites, although there has been enough to destroy the value of several.

The distribution of utilized rockshelters shows marked localization, 68% clustering around the mouth of the Pecos River, that is, between Parida Canyon and the river-bend lying south-southwest and upstream of the town of Shumla, Texas. It is true that, because of the location of the flood-pool contour at this point, our intensive survey did not extend farther upstream. But aerial flights and local information told us that there were inconsequentially few sites above that point, and evidently no large ones. Of the twenty-two sites downstream from Parida Canyon, exactly one-half are open sites (rock middens), and only three of the other eleven (which are all small rockshelters) appear to have been occupied consistently enough to contain any appreciable depth of cultural deposit.

It is obvious that this distribution is due, in a large part, to the differential occurrence of rockshelters brought about by strictly geologi-

cal causes, specifically the greater dissection and the more massive character of the limestone in the upstream sector and the more open, rolling character of the downstream sector. However, these cannot be the only factors. For one thing, of the rockshelters available outside the mouth-of-the-Pecos area, a considerable number were not occupied. Furthermore, in the downstream sector, the open sites, although more abundant than in the Pecos River sector, are neither numerous enough nor large enough to indicate an occupation even approaching the intensity of that around the mouth of the Pecos. Finally, accessibility to the perennial waters of the Rio Grande cannot be considered a differentiating factor because, except for the relatively easy descent immediately opposite the mouth of the Pecos, the rest of the mouth-of-the-Pecos sector has no easier descents than the peripheral sectors; in fact, the reverse is probably true. It seems obvious to us, therefore, that the occupation of the Mexican side was conditioned by three factors: 1) availability of rockshelters, 2) relative accessibility to the United States side of the Rio Grande, and 3) the fact that the Pecos River drainage was the center of occupational gravity for the entire region.

Compared to that of the United States, the Mexican side has fewer rockshelters. This is undoubtedly a geologic matter and one for which, at the moment, we have not been able to find any satisfactory explanation. The culturally significant facts, however, are that not all the Mexican shelters were occupied and that the total amount of cultural refuse is very much less there than on the United States side. To us, this indicates either a less intensive or a briefer occupation, or both. This problem of relative length of occupation is, of course, very difficult to attack at present because the chronological facts and the cultural relationships between the deposits on the two sides are unknown. Our guess at the moment is that the occupations of the two sides were roughly contemporaneous and of equal duration and that any difference in amount of cultural deposits is a matter of the numbers of people involved, i. e., the "intensity" of occupation.

While there are more shelters and more occupied shelters on the United States side, there appears to be a greater number of open sites on the Mexican side, if one takes into consideration the amount of terrain surveyed and the total number of sites encountered. If we weight the Mexican open-site frequency according to the proportion of all United States sites represented by all Mexican sites, we find that the weighted ratio is approximately 40/34 in favor of the Mexican side. In view of other information, this seems to be significant and to fit into the general pattern of occupation, as will be discussed below.

Another difference between the two sides is in the amount of parietal art. In our work, we encountered only one pictograph site, although three habitation sites contained a few traces of paint on their walls. On the other hand, the United States side produced 49 sites with pictographs, 19 of which, if we interpret the report correctly, were strictly pictographic and non-occupation (Graham and Davis, 1958: 77-81). Furthermore, the typical "Pecos River style" of rock painting was not found by us on the Mexican side, although H. C. Taylor (1948: 79) reported some Pecos River style pictographs at sites to the west of the area of our investigation. The few discernible pictures we did find are monochrome (red) and very crude: one figure represents a man holding what is probably a bow and arrow, another may show a detached rack of deer antlers (trophy?).

Collections

During the course of our survey, 184 artifacts (see Table 2) were collected from the surfaces of the sites, the "localities," and the general countryside traversed. Observations on a number of other cultural traits were recorded. No excavation was done.

TABLE 2

| | | |
|---|-----|-----|
| <i>Chipped Stone Artifacts</i> | | 179 |
| Choppers, large, monofacial, limestone | 3 | |
| Choppers, small, bifacial, limestone, chert | 3 | |
| "Hand axes" (?), small, bifacial, chert | 6 | |
| Scrapers, elongated, retouched | 28 | |
| Scrapers, rounded, retouched | 58 | |
| Knives, flake, retouched | 2 | |
| Knives, bifacial, large, triangular | 3 | |
| Clear Fork gouges | 3 | |
| Perforator | 1 | |
| Total | 107 | |
| Projectile points | | |
| Almagre (?) | 4 | |
| Abasolo (?) | 5 | |
| Channeled (?) | 1 | |
| Catan | 4 | |
| Darl (?) | 1 | |
| Desmuke (?) | 1 | |
| Ensor | 2 | |
| Fairland (?) | 6 | |
| Frio | 3 | |
| Gary | 1 | |

| | | |
|---------------------|---|----|
| Langtry | 4 | |
| Lerma | 1 | |
| Matamoros | 2 | |
| Paisano | 3 | |
| Palmillas (?) | 8 | |
| Pandale (?) | 4 | |
| Pandora (?) | 5 | |
| Shumla | 7 | |
| Tortugas | 3 | |
| Yarbrough | 1 | |
| Bassett (?) | 1 | |
| Fresno | 1 | |
| Livermore (?) | 2 | |
| Perdiz (?) | 2 | |
| Total | | 72 |

Ground and/or Polished Stone Artifacts

- Limestone bars
- Amulet (?), highly polished black stone, bar form
- Manos (two of igneous rock non-native to area)
- Metates

Non-movable "Stone" Artifacts

- Bedrock mortar holes (in 14 sites)
- Pictographs (in 4 sites)
- Grooves (often misnamed "sharpening grooves") (in 1 site)

Non-lithic Artifacts

| | |
|---|---|
| Bone awl, proximal end cannon bone of deer (?) | 1 |
| Bone awl, distal end cannon bone of deer (?) | 1 |
| Bone awl, cannon bone deer (?), fragmentary point | 1 |
| Fiber matting, twilled 2/2, small fragment | 1 |
| Fire drill, hardwood, fragmentary | 1 |
| Total | 5 |

Without going into more detail than the material warrants or space permits, there is little use in providing individual descriptions or proveniences for these specimens.⁴ Nor would there be value in quantifying such artifacts as the limestone bars, manos, or metates, because only a few were collected and no record was kept of the many others that were present, but left behind, on the surfaces of the sites. However, in regard to certain of these artifacts, it seems important to say a few words.

The classification of projectile points has been made according to the data contained in *An Introductory Handbook of Texas Archeology* (Suhm, Krieger, and Jelks, 1954). However, because Rul, who made

⁴ These data may be obtained from the Dirección de Monumentos Prehispanicos, Instituto Nacional de Antropología e Historia, Córdoba 45, México 7, D. F., México.

the identifications, has not worked in Texas archaeology and had no comparative collections to aid him, both of us feel some doubt as to certain of these identifications. Where doubt exists, a query has been placed following the type name. Furthermore, it has been Taylor's contention for a long time that elaborate cross-cultural and chronological inferences drawn from the simple and generalized forms subsumed under types such as Almagre, Abasolo, Catan, Gary, Lerma, Matamoros, and Tortugas are very dubious *in the absence of other supporting evidence*. It seems safer to regard such types as being descriptive, rather than having cultural or temporal implications, until corroborative evidence is adduced, discussed, and accepted.

Although complete quantitative data have not been published in the report on the United States side, it seems to us, from our own data and from personal communication with members of the other team, that many fewer (both proportionately and absolutely) of the small, late projectile points commonly attributed to use on arrows were found on the Mexican side. Of the larger "dart" points about whose identification we are reasonably certain, the number of types is evenly divided in the Mexican collection between those which are early (Frio, Langtry, Shumla) and those which are probably somewhat more recent (Ensor, Paisano, Yarbrough). These types are characteristic of the Pecos River Focus,⁵ with the exception of Paisano and Yarbrough whose centers of distribution are in the Big Bend and East Texas respectively—although Yarbrough is also found in late Edwards Plateau sites. Paisano is characteristic of the Chisos Focus which is said to overlap, but be generally later than, the Pecos River Focus (Kelley, Campbell, Lehmer, 1940: 162; Suhm, Krieger, Jelks, 1954: 57). Both Ensor and Frio are common in sites of the Edwards Plateau Aspect, while Langtry and Shumla are present but rare there. In other words, with the exception of Yarbrough, all of the solidly identified points are native to both the Edwards Plateau and the Trans-Pecos regions. This fact throws some doubt upon the validity of any distant relationships which might be claimed for some of the less certain types. On the other hand, both Shumla and Langtry points are said to have been found in the area around the Falcon Dam, where some of the less certainly identified types have also been identified (Aveleyra, 1951:

⁵ There is not the space here, nor is it appropriate in this survey report, to discuss the many points raised by Epstein (1960: 136-144, *inter alia*) in regard to the validity of the Pecos River Focus and the Chisos Focus concepts. We believe that he has made some cogent points but, since any meaningful discussion of these points would involve a much wider perspective and many more data than are directly pertinent to our present report, we feel that such discussion should await a more complete and broader publication than is our purpose here.

48-50). In addition, McNeish (1958: 193) has suggested a cultural and chronological connection between his Tamaulipas material and that of the Pecos River Focus based on like projectile point similarities. There may be something in all of this, but at the present we feel it better to be skeptical until more, and more certain and supported evidence is to hand.

Examples of the type called "limestone bar" were remarkably common in the sites of our survey, particularly those along the Rio Grande. These are arroyo-worn bars and small, thin, flat, oblong plates with well rounded and smoothed edges. They show no signs of having been worked into shape. Certain of them do, however, show signs of having been utilized: fine scratches, rubbed spots, high polish in restricted areas. The flat ones are very similar in form to the painted pebbles of the Pecos River Focus, and it is entirely possible that some of our examples at one time bore painted markings. At present, however, none of our specimens retains any paint. Whatever their use and function, their presence in the sites is not natural: they were selected for shape and brought there by human action. Finally, it should be noted that identical stones have been found in other sites in Coahuila and in the United States (Pearce and Jackson, 1933: 83; Taylor, personal records of Coahuila sites; Epstein, 1960: 99-100).

The absence from both the Mexican and United States sites of the notched snub-nosed end scrapers made on a small flake is noteworthy. Two unnotched specimens of this type (?) were found on the United States side (Graham and Davis, 1958: 21) but none at all on the Mexican. While this particular quantitative representation is quite certainly a matter of chance, nevertheless, when other distributional data are taken into account, it appears that the region of our survey may be the peripheral edge of a distribution which centers in Mexico further to the south. Personal communication (Beatriz Braniff, 1961) indicates that there is a heavy concentration of these notched end scrapers in the State of San Luis Potosi. Aveleyra (1956: 75, 84, 172) found 11 in sites of the Laguna District, southwestern Coahuila, and W. W. Taylor's excavations (personal notes) at Cuatro Cienegas, central Coahuila, produced two sites. In other words, there is the suggestion of a negative gradient for these artifacts from south to north through the arid country of east-central Mexico.

Summary and Conclusions

There can be no doubt that the aboriginal culture in the area of our survey was closely related, possibly identical, with that on the United

States side. An analysis of present information about the latter region certainly indicates that the center of population was in the vicinity of the mouth of the Pecos River (see maps in: Graham and Davis, 1958). The same can be said of the Mexican side. At the same time, there can be no doubt about the existence, particularly during the days of the Pecos River Focus, of a marked differential in the intensity of occupation on the two sides of the Rio Grande. This may have been, at least in part, a reflection of differing natural resources, particular living water. But that could not have been the whole story. The Mexican area was not occupied as intensively as it could have been, and the center of population there seems to have been more strongly influenced by accessibility to/from the other side of the Rio Grande than by any other factor or set of factors.

Without excavation, of course, the character of the Mexican occupation cannot be known precisely. But for one thing, the scarcity of pictographs, suggesting relatively less leisure and a more purposeful way of life and/or possibly less concern with religious matters, may indicate that the people occupied the Mexican side for some special purpose of an occasional and temporary nature. This purposive pattern of occupation may have been due to pressures having cultural, rather than natural, causes. Water certainly could not have been a determining factor, although it most probably was a contributing one. Periodic scarcity of foodstuffs, either plant or animal, or seasonal forays for special foods would be more likely, but our present information, from either side, is not capable of supporting inferences on this subject.

Two hypotheses, among not a few possible ones, present themselves as leads for future testing. The first is that the occupation of the Mexican side was just an expectable and somewhat less intensive but permanent expansion stemming from pressures in a homeland where food resources were finite and seasonal and where population was increasing. In this event, we would expect to find the cultural inventories of each side virtually identical—and this would include quantitative and proportional attributes as well as trait lists and type specifications. The second hypothesis is that the Mexican side was used for intermittent and purposive occupation by people with more permanent homes elsewhere. In this event, there should be differences in cultural inventories, the interpretation of which might expectably lead us to an understanding of the purpose(s) of these temporary visitations.

Thus it becomes very apparent that any reasonably full understanding of the historical facts and cultural implications of human life

in the area bordering the Rio Grande in Texas and Coahuila is dependent upon investigations on both sides of the river, not merely on one side. To study one and not the other would produce an only partial, and therefore warped, picture, if we are interested in more than taxonomic conclusions. The fact that the cultural remains on the two sides are alike does not mean that one is a mere repetition of the other. Each carries significance for the other, and each is therefore incomplete without the other. It is true that the cultural expressions are "similar," but we want to know *how similar and in what ways*. And, if possible, we want to know *why*.

References Cited

- Aveleyra Arroyo de Anda, Luis
 1951. Reconocimiento Arqueológico en la Zona de la Presa Internacional Falcón, Tamaulipas y Texas. *Revista Mexicana de Estudios Antropológicos*, Tomo 12, pp. 31-59.
- Aveleyra Arroyo de Anda, Luis, Manuel Maldonado-Koerdell, y Pablo Martínez del Río
 1956. Cueva de la Candelaria. Volumen I. *Memorias del Instituto Nacional de Antropología e Historia*.
- Bray, W. L.
 1905. Vegetation of the Sotol Country in Texas. *The University of Texas Bulletin*, No. 60, Science Series No. 6.
- Epstein, Jeremiah F.
 1960. Centipede and Damp Caves: Excavations in Val Verde County, Texas, 1958. Mimeographed report submitted to the National Park Service by the Texas Archeological Salvage Project, The University of Texas.
- Graham, John Allen, and William A. Davis
 1958. Appraisal of the Archeological Resources of Diablo Reservoir, Val Verde County, Texas. Mimeographed report prepared by: Archeological Salvage Program Field Office, National Park Service, Austin, Texas.
- Johnson, LeRoy, Jr.
 1960. Preliminary Pollen Analysis of Damp and Centipede Rock Shelters. In: Epstein, 1960, pp. 167-171.
- Kelley, J. C., T. N. Campbell, and D. J. Lehmer
 1940. The Association of Archaeological Materials with Geological Deposits in the Big Bend Region of Texas. *West Texas Historical and Scientific Society Publication No. 10*.
- MacNeish, R. S.
 1958. Preliminary Archaeological Investigations in the Sierra de Tamaulipas, Mexico. *Transactions of the American Philosophical Society*, Vol. 48, Pt. 6.
- Pearce, J. E., and A. T. Jackson
 1933. A Prehistoric Rock Shelter in Val Verde County, Texas. *The University of Texas Bulletin*, No. 3327.

Suhm, D. A., A. D. Krieger, and E. B. Jelks

1954. An Introductory Handbook of Texas Archeology. Bulletin of the Texas Archeological Society, Vol. 25.

Taylor, H. C.

1948. An Archaeological Reconnaissance in Northern Coahuila. Bulletin of the Texas Archeological and Paleontological Society, Vol. 19, pp. 74-87.

Taylor, W. W.

1956. Some Implications of the Carbon-14 Dates from a Cave in Coahuila Mexico. Bulletin of the Texas Archeological Society, Vol. 27, pp. 215-234.
1958. Archeological Survey of the Mexican Part of Diablo Reservoir. In: Graham and Davis, 1958, pp. 87-89.

Southern Illinois University
Carbondale, Illinois

An Analysis of Val Verde County Cave Material: Part II

MARDITH K. SCHUETZ

Introduction

This paper is the second part of a three-part summary description of artifacts from Pecos River Focus sites, based on studies of artifacts in the collections of the Witte Memorial Museum, San Antonio, Texas. The preceding part (Schuetz, 1956) described sandals and chipped stone artifacts. The present paper describes artifacts of wood, bone, antler, stone (pecked, ground, and painted), shell, clay, and skin. Part III, to appear in the following issue of this bulletin, will describe fibre and cordage specimens, basketry and matting, and will also present a general summary of the Pecos River Focus as now known.

Between 1928 and 1936 the Witte Museum sent several expeditions into the Trans-Pecos area of Texas. In 1929 Lieutenant-commander Claude S. Young explored caves in Santa Helena Canyon, Brewster County. In 1930 a preliminary survey of Brewster and Val Verde counties was made by Ellen S. Quillin, Director of the Museum, Col. M. L. Crimmins, William Capurro, and Leona Worley. "Uncle Tom" Miller of San Vicente served as guide. In 1931 a second survey was made by Sam Woolford and George C. Martin, and preliminary reports were published by Martin (n. d. a) and by Gardner and Martin (n. d.). In 1931 Emma Gutzeit and Mary Virginia Carson, with "Uncle Tom" Miller again serving as guide, also went over the area recording pictograph and petroglyph sites. Their portfolio has never been published.

In 1933 investigation of nine caves was undertaken by George C. Martin and his field crew near Shumla, about one-half mile north of the Rio Grande in southwestern Val Verde County. This work was partially reported by Martin (n. d. b).

In 1936 the Witte Museum sent another expedition to Val Verde

County. A field party, under the direction of J. Walker Davenport, extensively tested Eagle Cave, a large rock shelter just outside the town of Langtry. Sites in Jacal Canyon were also briefly investigated. A report on Eagle Cave was later published by Davenport (1938).

These early investigators, all amateur archeologists, can be credited with conscientious and careful work. Since their time the field of archeology has come a long way. New techniques of excavation have been developed, new standards of reporting have been achieved, and new scientific dating techniques have been introduced. A re-analysis of the Witte Museum materials from the Pecos River Focus now seems advisable.

The author has spent much of the past three years reworking the collections brought back from the Trans-Pecos area by the Witte Museum expeditions of the 1930's. The first fruit of this work was the publication in 1956 of a complete study of the sandals and lithic artifacts (Schuetz, 1956). In the course of research for that report, charcoal from Eagle Cave was found and a radiocarbon date of 4550 ± 130 years was obtained (Schuetz, 1957). The remainder of the material—artifacts of wood, bone, antler, shell, clay, skin, fiber and cordage, basketry and matting, and certain stone artifacts—has now been completely studied, and the results are presented in this and a following report.

A few explanatory statements are in order. Martin, in his reports, described only selected artifacts and in many cases these were not fully described. In the present report, which aims at more complete description, no attempt is made to avoid description of artifacts already described by Martin. Martin was convinced that "a single culture from hardpan to surface" was represented in the Shumla caves, and for this reason he did not record data having stratigraphic significance. The majority of artifacts from his Shumla caves were not labeled, so that today it is not possible to tell from which cave each specimen came. In the present paper the proveniences of artifacts are given only when this was recorded.

The specimens from Eagle Cave were labeled according to the recognized zones of occupation in which they were found. The organic debris in the successive occupation levels had been burned, so that Eagle Cave is known almost exclusively in terms of stone artifacts. The perishable artifacts, in which we are primarily interested in this study, are too few to be of much value. The few Eagle Cave specimens listed in Table 1, for instance, are all from Zones A and B of the cave.

The discussions of lithic material in this report stem from my own

earlier published analysis (Schuetz, 1956), which is based upon a classificatory scheme set up long after Davenport's work on Eagle Cave. The almost exclusive references to my own work are not to be construed as slighting Davenport's valuable Eagle Cave report.

To the following people, who volunteered their time and services to the Trans-Pecos expeditions, the Witte Museum is grateful: J. Walker Davenport, John S. Eross, Harding Black, Sam Woolford, George C. Martin, Albert Maverick III, John Davis, Everett Lehmann, George Nalle, Jr., John A. Ray, Gustave Bentrup, Burton Waters, Edward Ritchey, Joe Benz, Jack Specht, Emma Gutzeit, Mary Virginia Carson, and Peter Hohnstedt.

Artifacts of Wood

(See Table 1)

1. Rabbit Sticks or Fending Clubs

The collection includes 16 rabbit sticks, 15 from the Shumla caves and one from Jacal Canyon. Martin (n. d. b) reported 20 specimens from the Shumla caves, but the present writer recognizes only 15 in the museum collection.

One complete specimen came from Shumla Cave No. 8. It has a length of 32.5 cm., a width of 3.75 cm., and a thickness of 1.25 cm. It has deteriorated so much that it is now difficult to determine the groove pattern. Three grooved zones are still discernible in the middle portion; two more such zones may have been present on the ends, but no trace of them is observable. In each of the middle zones three grooves can be seen, but originally these zones may have consisted of five grooves each. Grooves appear on only one face. One end displays cuts perpendicular to the grooves.

Another nearly complete specimen, with only the ends missing, was recovered from Shumla Cave No. 1. Its present length is 35 cm.; it is 1.9 cm. wide and 1.1 cm. thick. This stick was split and appears to have been reinforced with fiber bindings. On both surfaces four long grooves run nearly the entire length of the specimen.

A third specimen (Fig. 1, B) from an unspecified Shumla cave is 25 cm. long, 2.5 cm. wide, and 1.6 cm. thick. Three sets of parallel grooves cover about three-fourths of the surface on each face of the specimen. The pattern consists of three long, four short, and three long sets of grooves. Martin (n. d. b: Plate XXX, top) presents a drawing of this specimen.

TABLE 1

Provenience of Artifacts Made of Wood

| | <i>Shumla Caves</i> | <i>Eagle Cave</i> | <i>Jacal Canyon</i> |
|---|-------------------------|-----------------------|-------------------------|
| 1. Rabbit Sticks | 15 | .. | 1 |
| 2. Atlatls | 3 | .. | .. |
| 3. Grooved Dart Foreshafts | 8 | .. | .. |
| 4. Grooved Arrow Foreshafts | 3 | 1 | 1 |
| 5. Barbed Wooden Foreshafts | 2 | .. | .. |
| 6. Tenoned Foreshafts | 10 | .. | 1 |
| 7. Sharpened Projectile Foreshafts | 72 | 2 | 6 |
| 8. Bunted Dart Foreshaft? | .. | 1 | .. |
| 9. Toy Arrow? | 1 | .. | .. |
| 10. Reed Shaft-Wood Foreshaft Combination | 6 | .. | .. |
| 11. Reed Shafts | 11 | .. | .. |
| 12. Hardwood Arrows? | 4 | .. | .. |
| 13. Bow-like Implements (Snare Triggers?) | 5 | .. | .. |
| 14. Fire Hearths (Wood) | 37 | 5 | 1 |
| 15. Fire Drills | 16 | 1 | .. |
| 16. Scoops | 5 | 1 | .. |
| 17. Fire Tongs | 1 | .. | .. |
| 18. Digging Sticks | 9 | .. | .. |
| 19. Wedges | 6 | 1 | 2 |
| 20. Stakes | 4 | 4 | .. |
| 21. Awls | 4 | 1 | .. |
| 22. Burred Wood | 4 | .. | .. |
| 23. Rasping Sticks | 2 | .. | .. |
| 24. Flageolets? | 2 | .. | .. |
| 25. Split Twigs Bent Double | 2 | 1 | .. |
| 26. Cane Cigarettes | 3 | .. | .. |
| 27. Cane Tubes | 9 | .. | .. |
| 28. Wooden Container | 1 | .. | .. |
| 29. Paint Brushes | 2 | 1 | 1 |
| 30. Needles? | 2 | .. | .. |
| 31. Shuttle | 1 | .. | .. |
| 32. Dart Nock | 1 | .. | .. |
| 33. Cradles | 3 | .. | .. |
| 34. Hafted Flint Artifacts | 3 | .. | .. |
| 35. Cane Fragments | 8 | 3 | .. |
| 36. Cut Wood | 33 | 21 | .. |
| 37. Wood Wrapped with Cordage | 13 | .. | .. |
| 38. Gummed Stick | 1 | .. | .. |

A fourth Shumla specimen (Fig. 1, A), cave unspecified, has a length of 18.75 cm., a width of 2.5 cm., and a thickness of 1.9 cm. On each surface are two short sets of three parallel grooves, and one end is scored by multiple cuts perpendicular to the grooves. Martin

(n. d. b: Plate XXX, center) also presents a drawing of this specimen.

A unique form of rabbit stick (Fig. 1, C) is a short specimen with a length of 20 cm., a width of 3.1 cm., and a thickness of 1.2 cm. This club is Y-shaped, but with one arm of the Y shorter than the other. The three extremities have a single set of four short grooves. Martin (n. d. b: Plate XLII, 6) illustrates this specimen but shows the opposite face.

Other rabbit sticks are fragmentary but indicate that widths range from 1.2 to 3.8 cm. and thickness from 1.1 to 1.9 cm. Two specimens are decorated with patterns other than the usual sets of grooves. One end fragment has two wide grooves with an incised zigzag between the grooves. Another end fragment has a series of 10 incised chevrons. Patterns of three and four grooves occur with about the same frequency and are often combined on the same specimen. One fragment lacks grooves of any kind.

2. *Atlatls*

Three atlatl fragments occur in the Shumla caves collection, but the specific cave provenience of each is unknown. Two of these are distal or hook-end fragments, the third a proximal fragment.

One distal fragment, with a length of 23.75 cm., has a width of 1.2 cm. and a thickness of approximately 1.6 cm. (Fig. 1, D). In cross-section it is keel-shaped, and the groove for placement of a dart is 9.5 mm. wide and only 1.2 mm. deep. The specimen is equipped with a carved hook that will engage either a conical or a widely grooved nock of the dart. The under side has a series of 19 deep notches. Gardner and Martin (n. d.: 16) show lateral and top views of this atlatl fragment.

A second distal fragment is of interest because it has been reworked (Fig. 1, E). It has a length of 19 cm., a width of 2 cm. at the hook end and 2.7 cm. at the opposite end, and a maximum thickness of 9 mm. It is nearly flat, having a very shallow groove (2 mm.) and is equipped with a carved hook. This specimen seems to have been reworked from a much longer original atlatl. The proximal end is cut off squarely and is without a grasp of any sort. The groove for the dart rather neatly parallels the lateral edges; but there are traces of a higher and older groove, indicating clearly that the specimen has been reworked and thus accounting for its present thinness and short length. Martin (n. d. b: Plate IX, 1) has two sketches of this atlatl, one being a lateral view.

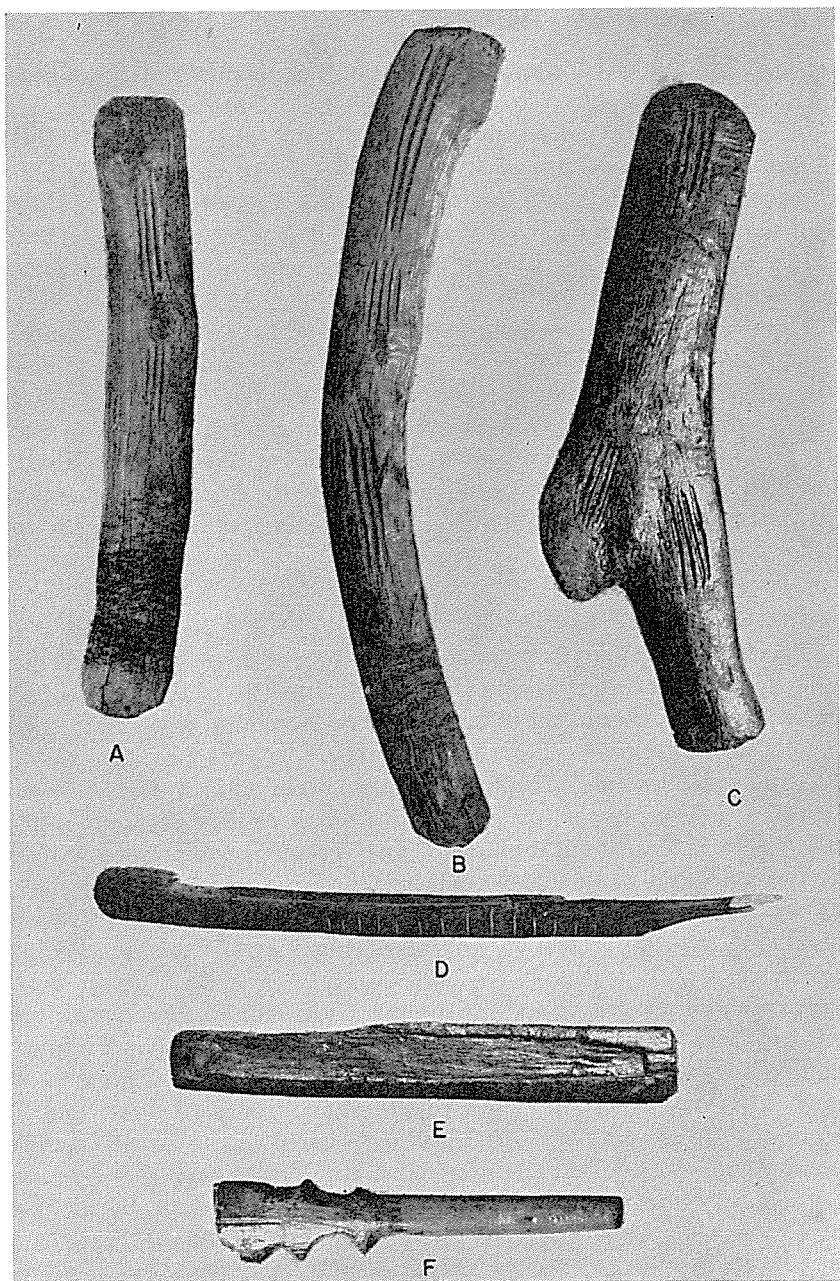


Fig. 1. Wooden artifacts from the Shumla caves. A-C, rabbit sticks or fending clubs; D-F, fragments of atlatls. Lengths of specimens (in alphabetical order): 18.75, 25, 20, 23.75, 19, and 15.3 cm.

The third fragment (Fig 1, F) is a proximal fragment with two finger notches on each side. The end is tapered and round in cross-section. The length of this specimen is 15.3 cm., the maximum width is 3 cm., and the maximum thickness is 1 cm. Martin (n. d. b: Plate IX, 2) also illustrates this fragment with two sketches, one being a lateral view showing details of the finger notches.

3. Grooved Dart Foreshafts

Eight dart foreshafts (Fig. 2, A), all from the Shumla caves, are so designated because of their size and weight. They are made of hardwood and have wide, deep grooves at the distal end for reception of dart points. The proximal ends are tapered to fit cane shafts. Lengths range from 10.6 to 15.6 cm. and diameters from .95 to 1.25 cm. The distal grooves have widths of 4 to 5 mm. and depths of 1 to 1.5 cm. One specimen (Fig. 2, B) has a wide triangular point still gummed into place. This chipped stone projectile point is probably of Tortugas type (Suhm *et al.*, 1954: 482), but positive identification is impossible because the base cannot be examined. A sketch of this specimen is illustrated by Martin (n. d. b: Plate IX, 3). Another specimen (Fig. 2, K) has a length of 28.1 cm., 18.7 cm. of its length having been tapered to fit into a reed shaft that has a maximum diameter of 8 mm. This appears to be the same as a specimen illustrated by Martin (n. d. b: Plate VII, 5).

4. Barbed Wooden Foreshafts

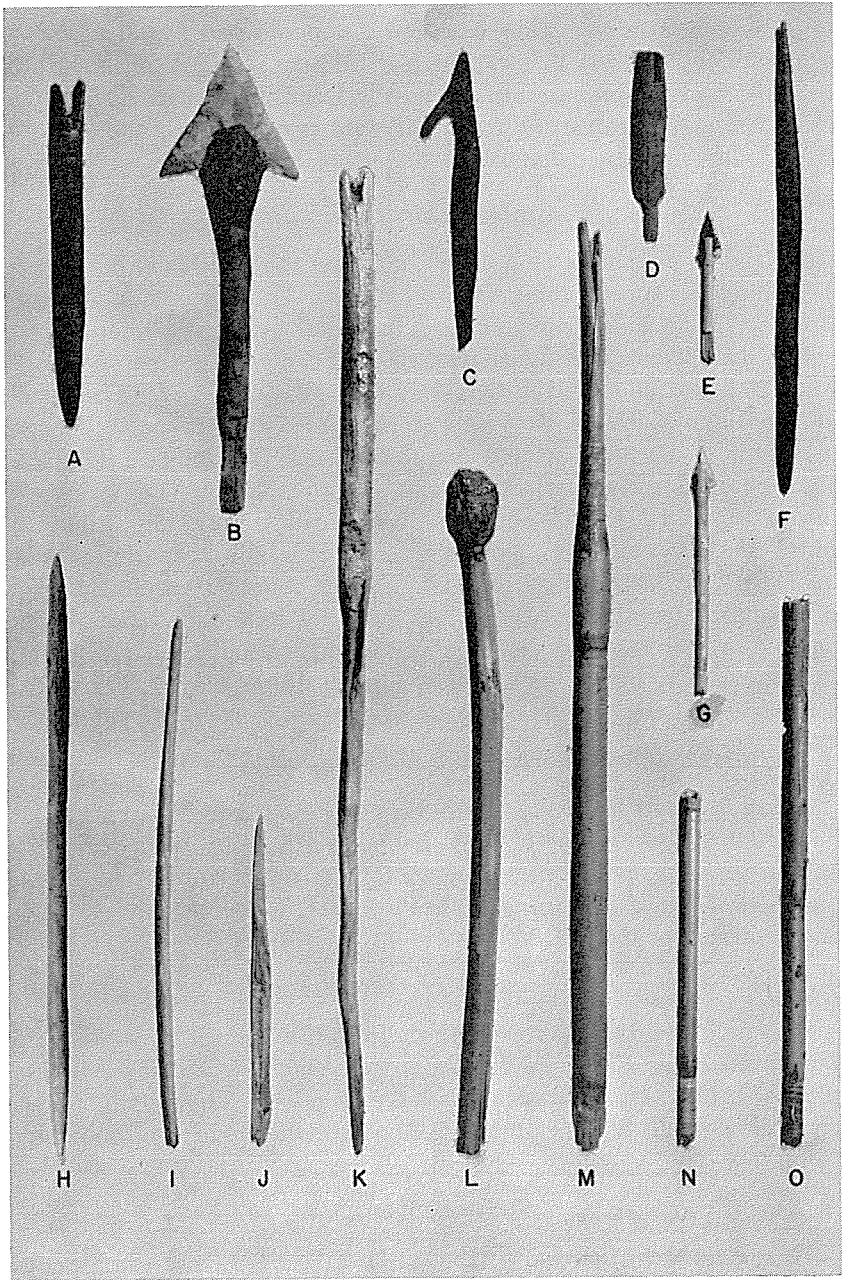
Two foreshafts from the Shumla caves were made from twigs that have natural barbs. One of these has a length of 16.3 cm. and a diameter of 6 mm.; the other (Fig. 2, C) has a length of 9 cm. and a diameter of 6 mm. Martin (n. d. b: Plate VII, 6) has a sketch showing one of these specimens.

5. Grooved Arrow Foreshafts

This includes five specimens, three from the Shumla caves and one each from Eagle Cave and Jacal Canyon, that have distal grooves so small that only arrow points could have been used. The proximal ends are broken on all five specimens. All have diameters of approximately 5 mm.

6. Tenoned Foreshafts

Eleven tenoned foreshafts (Fig. 2, D, E, G), 10 from the Shumla caves and one from Jacal Canyon, fall into two distinct size groups



that suggest use with both darts and arrows. All are made of wood; but some were distally grooved to receive stone points and others were merely tapered and sharpened at the distal end.

Three large specimens are probably unfinished. The tenons are carved, but the distal ends remain unaltered from the original cutting and splintering of the twig. These are of interest mainly because they suggest probable stages of manufacture. A fourth specimen has a sharpened point. A fifth differs from all the others; it is plano-convex in cross-section, the distal end is bluntly tapered, and the proximal end is shouldered, giving an outline somewhat like that of a stemmed projectile point. A sixth specimen is complete and has a distal groove (cf. Martin, n. d. b: Plate X, 1, 7, and 2 respectively). The diameters of these large specimens range from 8 to 16 mm. Lengths of the two complete specimens are 5 and 7.5 cm. respectively.

Four small specimens were recovered, and all have a length of about 6.3 cm., a diameter of about 6 mm. Two are distally grooved; one is cut off squarely at the distal end, possibly for use as a bunt; and the fourth is broken at the distal end (see Martin, n. d. b: Plate X, 3, 4, 5).

These tenoned artifacts are puzzling. No artifact has been found with a mortise to receive the tenon, and the tenoned proximal end does not appear to be adapted for use in a cane shaft. Specimen size points to their use with dart and arrow points, but this calls for a compound foreshaft with a toggle-head arrangement without precedent in the Southwest. And there are no holes for a toggle-head attachment. It has been argued that these artifacts are remnants of longer foreshafts that have been shortened for some reason, the tenon being accidentally fashioned during the process of making a new groove. This argument does not satisfy the writer. If shortening was desired, this could be done most simply by cutting to the desired length, using the customary encircling groove and breaking technique, and then grooving the end. The finished appearance of the tenoned artifacts also argues against their identification as discards.

7. Sharpened Projectile Foreshafts

In the museum collection are 80 sharpened projectile foreshafts, 72

Fig. 2. Projectile foreshafts and shaft fragments. A-B, G, grooved dart foreshafts; C, barbed wooden foreshaft; D-E, tenoned foreshafts; F, H-J, sharpened foreshafts; G, arrow foreshaft; K, dart foreshaft; L, bunted dart foreshaft (?); M, reed shaft fragment with hardwood foreshaft; N-O, cane shaft fragments. All specimens from Shumla caves except K, which is from Eagle Cave. All to same scale, length of K, 28.1 cm.

from the Shumla caves, two from Eagle Cave, and six from Jacal Canyon. Thirteen of these are pointed at both ends (Fig. 2, F, H), their lengths ranging from 16 to 35.6 cm., and the maximum diameter being 6 mm. Twelve additional foreshafts are pointed at one end and cut off squarely at the other. The maximum diameter in this group is 6 mm., but length ranges from 5.6 to 20 cm. One of these specimens has a droplet of gum on the distal end.

The remaining 55 foreshafts are pointed at one end and broken or charred at the other (Fig. 2, I-J). Two have traces of gum on the pointed ends for distances of about 2.5 cm. from the tip. A third has a trace of gum on the pointed end for a distance of about 5 cm. from the tip, suggesting the use of gum in securing the end in a cane shaft. About 90% of these foreshafts have diameters ranging from 4 to 7 mm. The remainder have diameters of 8 or 9 mm.

Martin (n. d. b: 27) mentions finding foreshafts bearing red paint, but no such specimens can now be found in the museum collection.

8. *Bunted Dart Foreshaft?*

The one possible example of a bunted dart foreshaft (Fig. 2, L) is from Eagle Cave. This specimen (length 21 cm.) is made of wood that appears to have been held in fire; the distal end has a diameter of 1.6 cm., the broken proximal end a diameter of .7 cm. Martin (n. d. b: Plate VII, 2) shows a sketch of this specimen.

9. *Toy Arrow?*

A twig (length 13.75 cm.) from the Shumla caves is sharpened to a point on one end, while the opposite end, partially broken, bears some indication of having been grooved as though for a bowstring. The damaged end has a fiber binding around a bit of feather quill. Martin (n. d. b: Plate XXXVII, 1) describes this as a needle.

10. *Reed Shaft-Hardwood Foreshaft Combinations*

In this category are six specimens from the Shumla caves. One specimen has the entire foreshaft intact, but it has a narrow distal groove, ruling out the possibility of its use with a dart point.

Four specimens, including the one just mentioned, have reed shafts that are tapered to make a smoother receptacle for the foreshafts. Three (Fig. 2, M) are bound with sinew at the point of union to secure the foreshafts, and one is bound with fiber. The proximal ends of

these specimens are missing. Shaft diameters range from 6 to 9 mm. Martin (n. d. b: Plate VII, 1) illustrates one of these.

Another specimen consists of a 7.5 cm. length of cane neatly cut off at both ends, and into one end is inserted the pointed end of a hardwood foreshaft having a length of 6.25 cm. The cane is not tapered at the juncture, giving the specimen an awkward appearance. It is doubtful if the two pieces belong together.

An unusual specimen is a hardwood shaft narrowed 7.5 cm. from the point and perfectly fitted with a cane sleeve having a length of 1.9 cm. at the narrowed portion. The proximal end is broken.

11. Reed Shafts

The 11 specimens in this category, all from the Shumla caves, are known only from their proximal ends (Fig. 2, N-O). Five of these show a range in diameter from .8 to 1 cm. The nock ends are narrowed and all were originally bound. On one specimen the binding is of fiber; on another it is of sinew. Bindings are missing from the others. Nocks are all grooved instead of conical. Above the fiber nock binding of one specimen is an area 1.9 cm. long that bears incised decoration. This consists of three longitudinal panels, each panel made up of two rows of V's. One row of V's in each panel runs in an opposite direction from the other. At the apex of each V is a short horizontal line.

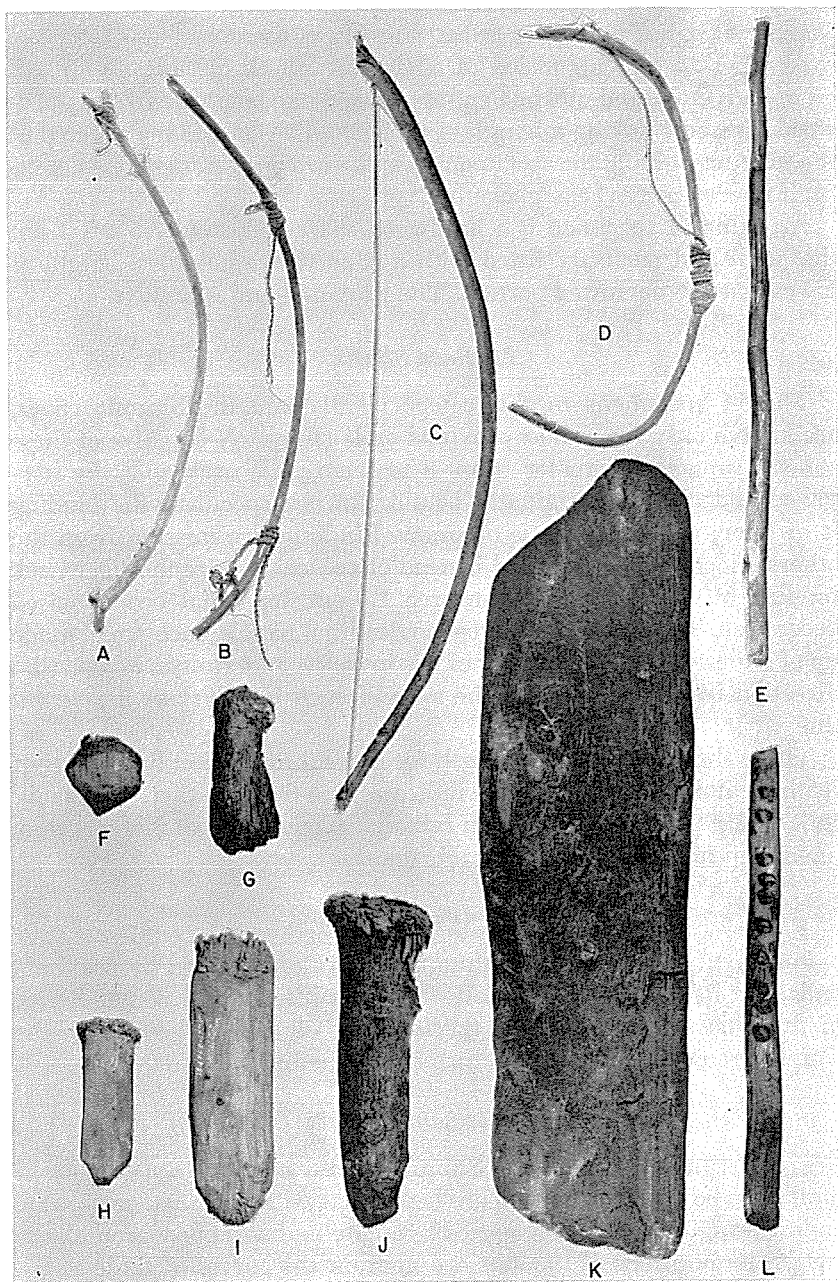
Three shafts of sufficient length for careful inspection have parts of feathers attached. One example indicates that three feathers (probably split) were used. Traces of gum remain, suggesting that feathers may have been further secured with this material.

12. Hardwood Arrows?

Four artifacts from the Shumla Caves are represented by proximal ends that have grooves too shallow for the insertion of points. Three of the grooves are V-shaped, the fourth U-shaped. All look like the simply grooved nocks of some historic Plains Indian arrows.

13. Bow-like Implements (Snare Triggers?)

Five artifacts, all from the Shumla Caves, have the appearance of miniature bows. Two of these are bent twigs with two slits on opposite ends through which fiber cord is caught and wrapped around the twig. The positions of the slits are high on the curves of these twigs. On the complete example (Fig. 3, B) the straight distance from one



slit to the other is 26.25 cm. The second specimen apparently was broken just short of the second split. The cord used on both consists of two-ply S-twisted yarns twisted Z fashion into a strand.

A third specimen (Fig. 3, A) utilizes Y-shaped projections on the twig rather than splits on the ends to hold the cord. Cord construction is the same as those described above. Martin (n. d. b: Plate VII, 4) shows a sketch of this specimen).

A fourth specimen (Fig. 3, D) consists of two bent twigs bound together with heavy, loosely-twisted fiber cord. In addition, a finer cord of the same type as described above is wrapped around the twig at one end of the binding, leaving a long piece hanging loose. The end of this cord is broken and it is impossible to determine its function. The distance between the two ends of this specimen is 20.5 cm.

An informant who builds animal traps and snares tells me that these are probably spring devices used with noose snares. When the snare is tripped, the bow springs back, tightening the noose around the leg or head of an animal. Because of their small size and light weight they were probably used for birds only.

A fifth specimen (Fig. 3, C) resembles a miniature bow and is strung with fine fiber cord of the same construction as described above. This cord is wrapped around the ends and drawn taut. The bow has a length of 31 cm.

14, 15. *Fire Hearths and Fire Drills*

In the museum collection are 43 wooden fire hearths, 37 from the Shumla Caves, five from Eagle Cave, and one from Jacal Canyon. These hearths (Fig. 3, L) are made from split stalks and have drilled depressions. The collection also includes 17 fire drills, 16 from the Shumla Caves and one from Eagle Cave. These drills (Fig. 3, E) are straight pieces of hardwood with rather uniform diameters (range 7 to 9 mm.); the ends are rounded and charred from use in the hearth depressions. Martin (n. d. b: Plate XLIII, 3-4) illustrates 11 hearths and six drills.

16. *Wooden Scoops*

The term scoop is applied to split, elongated pieces of wood whose

Fig. 3. Miscellaneous wooden artifacts. A-B, D, bow-like implements (snare triggers?); C, miniature bow; E, fire drill; F, H-I, wedges; G, J, stakes; K, scoop; L, fire hearth. Lengths of A-D: 25, 26, 31, and 20.5 cm. respectively; E-J, to same scale, length of F, 2.3 cm.; K-L, to same scale, length of K, 31.5 cm.

ends are beveled or otherwise altered by use (Fig. 3, K). The charred surfaces of these objects indicate extensive usage in fires. Some have parallel sides, but others taper slightly toward one end. Sixteen of these scoops are from the Shumla Caves and one is from Eagle Cave. In length they range from 15 to 31.3 cm., in width from 3.8 to 8.8 cm.

17. Fire Tongs

The collection includes a single specimen (Shumla Caves) that is made of a split section of sotol flowering stalk (length 25 cm.). The stalk section is bent to bring the two ends near each other and this bend is loosely held by split lechuguilla leaves. The flat sides of the two ends face each other, and both ends are charred.

18. Digging Sticks

Out of a total of nine digging sticks (all from the Shumla Caves), only two are complete, and these have lengths of 50 and 52.5 cm. respectively. The ends of all nine specimens are beveled and have plano-convex cross-sections. In diameter these sticks range from 1.25 to 2.5 cm.

19. Wedges

These are flat pieces of split hardwood whose distal ends are cut into V shapes or are beveled. The proximal ends show evidence of pounding (Fig. 3, F, H, I). The length ranges from 2.3 to 3.8 cm., the width from 1.25 to 2.5 cm. Of the nine specimens, six are from the Shumla Caves, one from Eagle Cave, and two from Jacal Canyon.

20. Stakes

These are short lengths of twigs whose diameters average 3.1 cm. One end is pointed, the other frayed from pounding (Fig. 3, G, J). The collection includes eight specimens, four from the Shumla Caves and four from Eagle Cave, whose lengths range from 9 to 17 cm.

21. Awls

Five objects, four from the Shumla Caves and one from Eagle Cave, are considered to be awls. One complete specimen labeled "Old Shumla" is made of hardwood; one end is sharpened to a point, the other carefully rounded. It has a length of 24.1 cm. and a diameter of .95 cm. This specimen is longer than an awl needs to be. Its length

suggests a dart foreshaft, but its proximal end is not properly formed for placement in a cane shaft.

22. *Burred Wood*

From the Shumla Caves there are four objects with single ends split into thin strips that curl like paper ribbon. The opposite ends are ragged from being broken or twisted. In diameter these sticks range from 6 to 16 mm.

23. *Rasping Sticks*

Two fragmentary rasping sticks were recovered from the Shumla Caves. One is a round twig (diameter 6 mm.) with wide notches cut into it. The other is a flattened piece of wood (width 9 mm.) with notches (width 3 mm.) cut into it at intervals of about 2 mm. Martin (n. d. b: Plate IX, 6) has a sketch of one of the above specimens.

24. *Flageolets?*

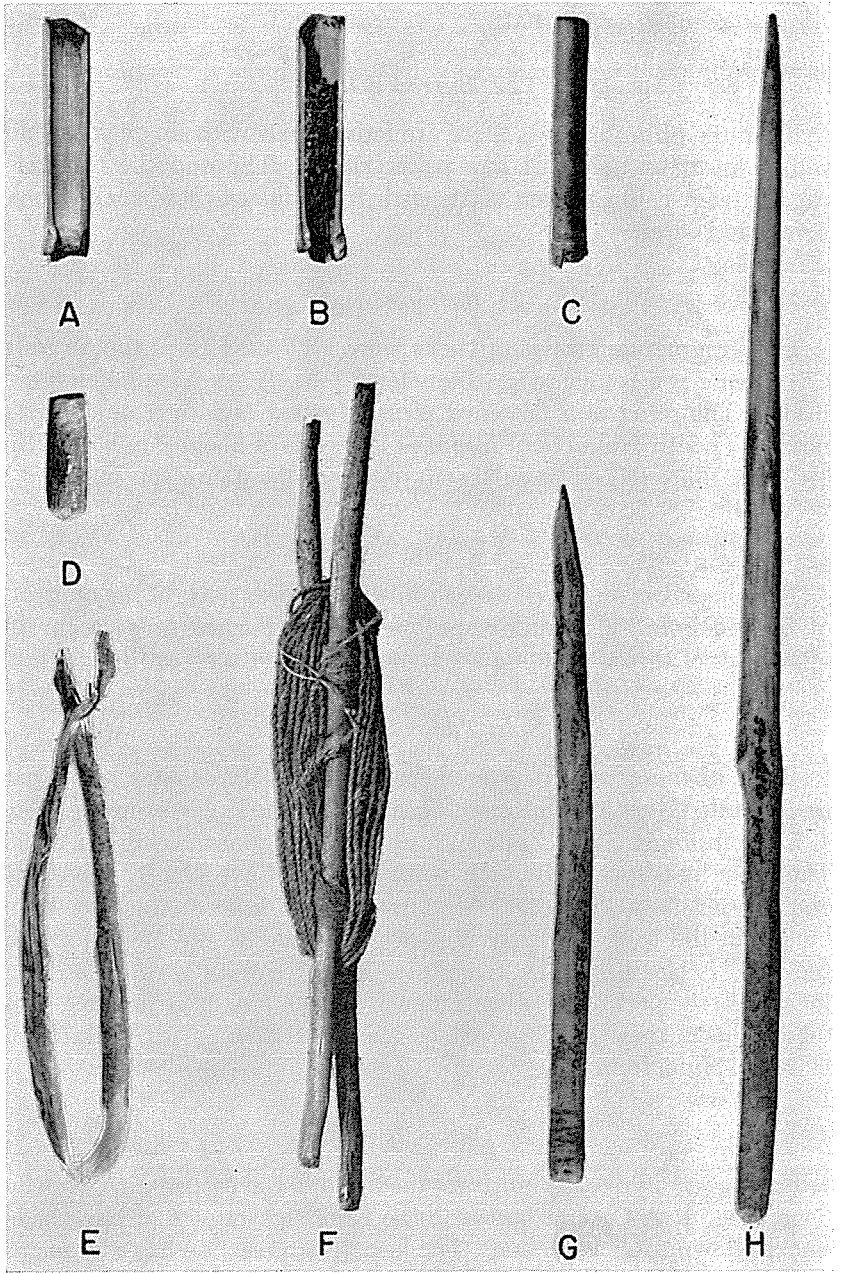
Two pieces of cane from the Shumla Caves bear parts of the margins of burned holes. As similar specimens with burned holes occur in other sites of this area, these are tentatively identified as flageolets.

25. *Split Twigs Bent Double*

Three of these were recovered from the Val Verde sites, two from the Shumla Caves and one from Eagle Cave. The single example (Fig. 4, E) from Eagle Cave (Zone A, top) is bent so that the ends are even. The other two specimens both from Shumla Cave No. 5) have one end shorter than the other. All three examples seems to have been buried in the cave deposit with only the bend of the loop exposed; the bend is clean, but the remainder is coated with cave deposit. In length these specimens range from 5 to 18.7 cm. It is possible that these objects may have served as skin stretchers (see Artifacts of Skin and Hide, Item 6).

26. *Cane Cigarettes*

Three sections of cane, all from the Shumla Caves, contain cedar foliage (Fig. 4, A-C) and appear to be cane cigarettes that have been smoked down to short sections. The largest cane section has a diameter of 1.9 cm. In two of these specimens the septum has been removed, but



in the third a small hole has been drilled through the septum. Martin (n. d. b: Plate XV, 1) has a sketch of one of these specimens.

27. *Cane Tubes*

Nine sections of cane, all from the Shumla Caves, have been carefully cut, possibly to serve as containers and cigarettes. In seven of the nine specimens the joints have been removed. In length these tubes range from 5 to 18 cm., in diameter from 1 to 1.9 cm. Martin (n. d. b: Plate XV, 2-3) presents sketches of two such tubes.

28. *Wooden Container*

A small piece of wood from the Shumla Caves has been cut to a length of 5.9 cm. and hollowed out at one end to a depth of approximately 2.5 cm. This object tapers slightly toward the open end. Its maximum diameter is 1.25 cm.

29. *Paint Brushes*

Of the four paint brushes, two are from the Shumla Caves and one each from Eagle Cave and Jacal Canyon. Two specimens are made of bundles of sotol leaves folded lengthwise and wrapped near the distal end with the same material. Their ends are shredded for use, and one example bears red pigment. The remaining two specimens consist of short woody stalks with one end shredded diagonally. Martin (n. d. b: Plate XXVI, 2-4) has sketches of three of these shredded stalks.

30. *Needles*

Two artifacts from the Shumla Caves may be needles that were used in making basketry or netting. They have lengths of 15 and 11.3 cm. respectively. One has a fiber binding around the proximal end (Fig. 4, G); the other (Fig. 4, H) once had a similar binding, and it also has a groove running about one-third its length from the proximal end. Martin (n. d. b: Plate XXXVII, 1-2) has sketches of two such needles. His No. 2 is the same as Fig. 4, G.

Fig. 4. Objects of cane and wood. A-C, cane cigarettes (A and B parts of same specimen); D, wooden dart nock; E, split twig bent double; F, wooden shuttle; G-H, wooden needles. A-E, to same scale, diameter of B, 1-9 cm.; length of F, 15 cm.; G-H, to same scale, length of H, 15 cm.

31. Shuttle

A shuttle (Fig. 5, F) from the Shumla Caves is made of two twigs (lengths approximately 15 cm.) loosely bound together in two places. Fine fiber cord is wrapped around the bindings and between the two twigs. A sketch of this shuttle is illustrated by Martin (n. d. b: Plate XII).

32. Dart Nock

A wooden nock (Fig. 5, D) for insertion in a cane dart shaft was found in one of the Shumla Caves. This nock has a length of 2.5 cm., and one end has a conical pit for use with the atlatl. Wooden nock plugs for reinforcing the proximal ends of cane shafts may have been used more frequently than has been realized. Examination of the ends of four cane arrows shafts from the Shumla Caves revealed that three of them were so plugged before a groove was carved. The fourth appears to have utilized the joint of the cane instead.

33. Cradles

Three cradles were obtained from the Shumla Caves. One of these, a toy cradle, has been damaged since it was excavated and cannot be as fully described as the other two.

(1) *Cradle No. 1.* This specimen (Fig. 5, A) which has a length of 57.5 cm., has a framework made from the fork of a tree branch. The average diameter of this framework wood is 9 mm. Lashed crosswise beneath the triangular frame are two sections of split sotol flowering stalk, the flat sides of the split stalk resting against the frame. The shorter of these two crosspieces is lashed on at a distance of 23.8 cm. from the top of the cradle (apex of the triangle); the other is lashed on 7.5 cm. from the opposite end or bottom of the cradle. Lying on, and lashed to, these crosspieces are a number of closely spaced twigs. Fifteen of these twigs, whose diameters are rather uniform in size (3 to 4 mm.), are still held in place by the shorter of the two crosspieces. The lashing cord used is a two-ply Z-twisted fiber strand with a diameter of 3 mm. It appears that this cord was first used to lash the crosspiece in place on one side and that the remaining length was then used to lash the longitudinal twigs across to the opposite side. The cord passes across each twig diagonally and around the crosspiece more or less at right angles to its longitudinal axis.

On both sides of the shorter crosspiece, at distances of 6.3 and 10 cm.

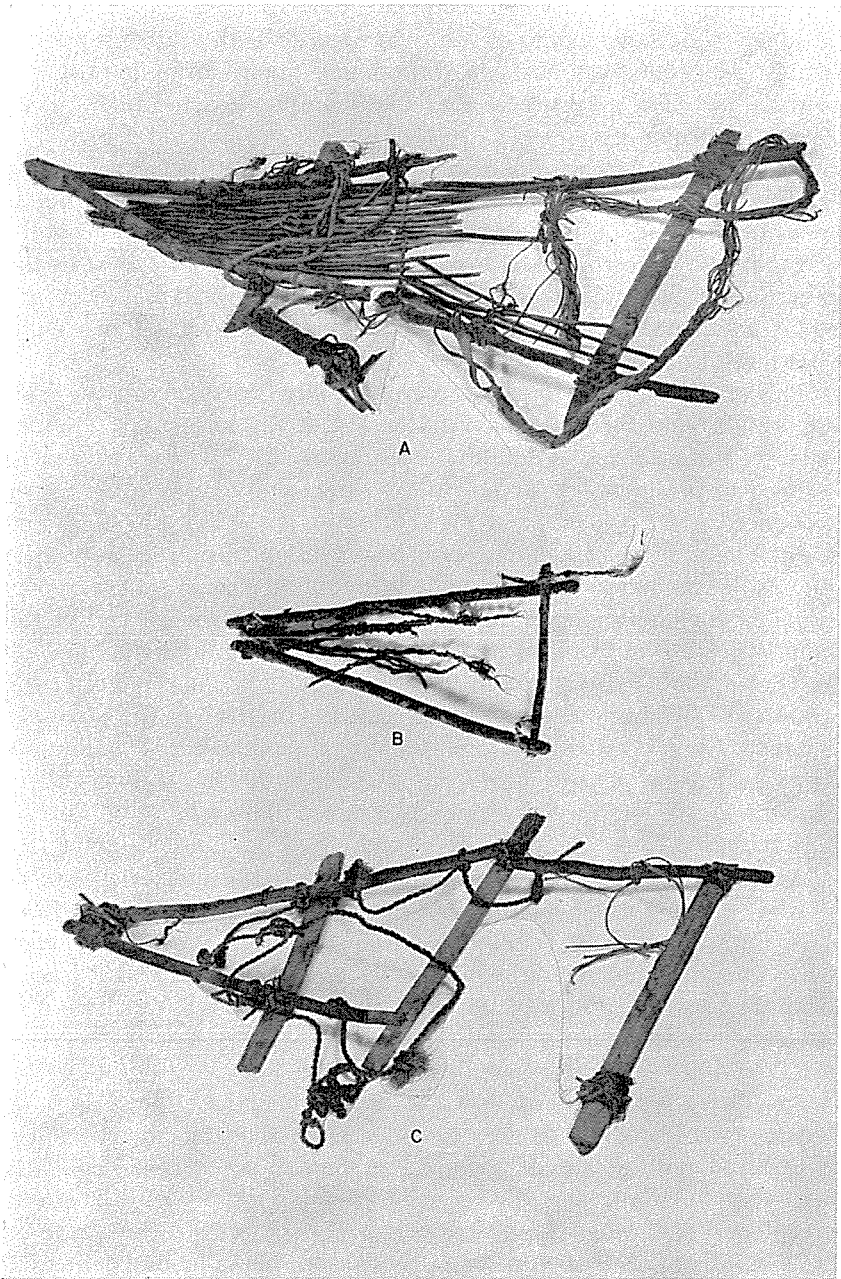


Fig. 5. Three cradles from the Shumla caves. Length of A, 57.5 cm.; B, 25 cm.; C, 55 cm.

respectively, cords are twined about each twig and tied to the frame on each side. The same length of cord was used for both twined supports, being wrapped around one side of the frame to pass from one support to the other. The cord used for this is two-ply S-twisted fibers in a Z-twisted strand.

About 10 cm. below the top or shorter crosspiece the twigs are also held in place by twined cord, and at this point about four additional twigs were added, on the left side, to compensate for the greater width of the frame. The cord used here is the same as that described in the preceding paragraph. Four inches farther downward the twigs are again held in place by twined cord, but the cord is lighter in weight (diameter 1 mm.) and doubled.

This cradle seems to have been ceremonially broken across the middle section, and the twigs have fallen out of the lower part, leaving only six still attached at one side. Presumably the missing twigs were secured to the lower crosspiece in the same manner as on the upper crosspiece.

Attached to the frame approximately 18.8 cm. from the bottom of the cradle is a bundle of cords made by doubling a set of six cords, presumably for holding the infant in the cradle. The looped end of the bundle is secured to the frame by a leather thong, and the opposite end has a leather thong drawn through it, possibly for tying after the infant was laced into the cradle. The cordage in this bundle is two-ply S-twisted yarn twisted Z fashion into a strand. One end of the bundle has the cords roughly braided for a distance of 30 cm., and it is likely that the entire length was originally braided. The total length of the cord bundle is 77.5 cm.

Attached to the upper end of the cradle near the shorter crosspiece is what appears to be a burden strap made of a fiber coil on a fiber cord foundation. This will be described in the section on cordage. Only one apparent lacing loop appears on this cradle, and this is a fiber cord fastening located opposite the leather thong attachment of the cord bundle. Martin (n. d. b: Plate XXXVI) has a drawing of this cradle.

Associated with this cradle is a small leather pouch (see Fig. 5, A, lower center) made from a rectangular piece of leather doubled over and sewed with a leather thong. The pouch was sewed diagonally across the top, down the side opposite the fold, and across the bottom, completely enclosing whatever it originally contained. The specimen is 7.5 cm. long and 1.9 cm. wide; the bottom bears leather fringe 10 cm. in length. Possibly this pouch originally contained the child's umbilical cord.

Cradle No. 2. This cradle (Fig. 5, C) is also triangular in outline and has a length of 55 cm. The V-shaped frame is made of two branches (average diameter 8 mm.) bound together by heavy cord (diameter 4 mm.). This cord was first wrapped horizontally around the two sticks and then wrapped vertically between the sticks. The cord used is two-ply Z-twisted. A strip of split leaf is coiled vertically around the cord lashing.

Three split sotol stalks are lashed across the frame at intervals of 18.8, 33.8, and 50 cm. from the top of the cradle (apex of the triangle). Some of the lashings are split leaves; others are fiber cord with diameters ranging from 1 to 4 mm. Fiber cord loops are attached to both sides of the frame; three of these are intact on one side of the frame and two on the other. Originally there may have been four or five loops on each side. A fiber cord passes through some of these loops and is apparently the cord that was used to lace the infant into the cradle. Cordage used for the tie loops and lacing cord consists of two-ply, S-twisted yarns forming a Z-twisted strand 4 mm. in diameter.

Unlike Cradle No. 1, this cradle has no twigs inside the triangular frame. A comparison of Fig. 6, C, with Martin's (n. d. b: Plate XLIV, 7) earlier illustration shows that this cradle is now less complete than it formerly was.

Cradle No. 3. This small cradle (Fig. 5, B), which appears to be a toy form, was found in "Old Shumla." It has a length of 25 cm., and the frame is made of three twigs lashed together with fiber cordage to form a triangle. The lashing at the apex of the triangle consists of a cord tied to the end of one stick, looped over the second stick, and then apparently running down one side of the frame to serve as lashing for the stick forming the base of the triangle. The twig forming the base is set into encircling grooves cut into the side twigs. Remnants of several cords attached at the apex indicate that the space inside the triangle was loosely filled by cords extending from top to bottom of the cradle. These longitudinal cords seem to have served the same purposes as the closely spaced longitudinal twigs of Cradle No. 1. Cordage used in Cradle No. 3 consists of two-ply, S-twisted yarns forming a Z-twisted strand.

34. *Hafted Flint Artifacts*

As lithic artifacts from these Pecos River Focus sites were described in the first part of this report (Schuetz, 1956), only hafting techniques will be described here. Three flint artifacts from the Shumla Caves were hafted to wooden handles.

The first hafted specimen (Fig. 6, A), which is from Shumla Cave

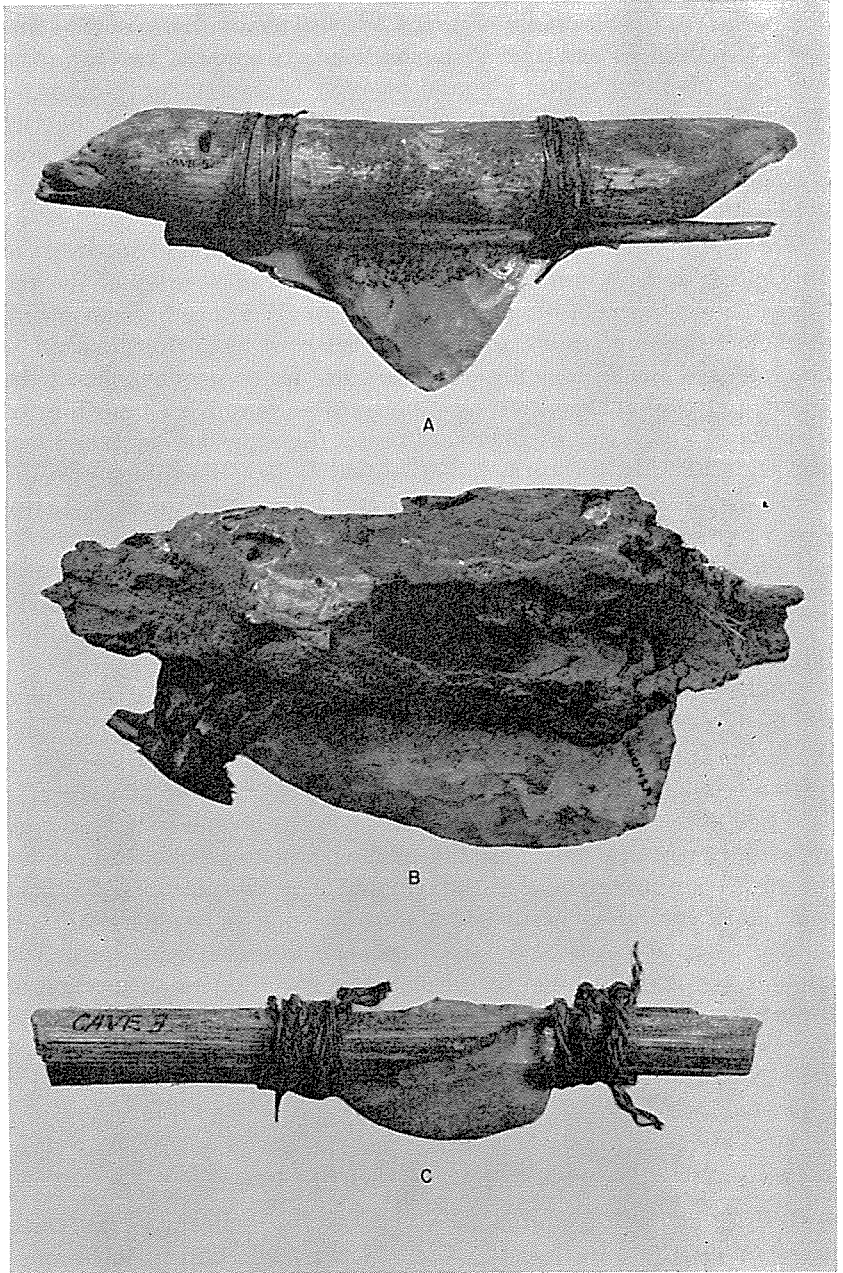


Fig. 6. Hafted flint artifacts from the Shumla caves. Length of A, 8 cm.; B, 14 cm.; C, 7.2 cm

No. 5, is a convex-based flint knife with beveled lateral edges. It is plano-convex in cross-section. This knife has a length of approximately 8 cm. and a width of 6.6 cm. Its base is set in a short section of wood (diameter 3.3 cm.), the seat being a narrow, carved-out slot. Remnants of an unidentified material at the bottom of the slot suggest that the slot was partially filled in to help secure the knife. On each side of the knife are two small sticks that are lashed to each other, and these sticks are also lashed to the slotted handle. Stains and bits of dark material on the blade and on the wooden parts indicate that the knife was also heavily cemented in place. The lashing elements consist of fiber cord and strips of lechuguilla leaves. Martin (n. d. b: Plate XXXIII) has published a sketch of this hafted knife.

The second specimen (Fig. 6, B) is a triangular, convex-based knife set laterally in a piece of wood, presumably for use as a scraper or knife. Although the handle is poorly preserved, it is clear that the stick was split rather than slotted. The wooden handle has a diameter of 4 cm., and its present length is 14 cm. The blade was cemented in place with gum. Remains of fiber cord lashings indicate that the split stick was held together by encircling cords at both ends of the flint knife. The knife is made from a large plano-convex flint flake and shows flake scars only on the convex face. It has a length of 9 cm. and an estimated width of 6.3 cm. The remains of fiber cord were heavily treated with preservative, so that the technique of manufacture cannot be fully determined. The strands appear to be two-ply, Z-twisted. Martin (n. d. a: 9) illustrates this specimen.

The third hafted specimen (Fig. 6, C), which is from Shumla Cave No. 3, consists of a small flake knife set laterally between a piece of split sotol flowering stalk that is lashed together with fiber cord. The handle has a length of 7.2 cm. The fiber cord consists of two-ply, S-twisted yarns forming a Z-twisted strand. A sketch of this specimen is given by Martin (n. d. b: Plate XXXIII).

In addition to these hafted specimens, there is other evidence of hafting at these sites. One Tortugas (?) point is hafted to a dart fore-shaft (Fig. 2, B), and two Kinney points and one Abasolo point still retain traces of gum on their proximal ends. Hafted flint tools have also been reported from the western Trans-Pecos (Sayles, 1941) and from Coahuila, Mexico (Aveleyra Arroyo de Anda *et al.*, 1956: Lám. XI-XVI, 41-42).

35. Cane Fragments

Eleven cane fragments are included in the museum collection, eight from the Shumla Caves and three from Eagle Cave. Some of these

specimens may be parts of artifacts, but the surviving fragments are too small for identification.

36. *Cut Wood*

This includes pieces of wood, small twigs, and cane that show traces of having been cut. This series totals 54 specimens, 33 from Shumla caves and 21 from Eagle Cave.

37. *Wood Wrapped with Cordage*

Thirteen such specimens were recovered from the Shumla caves. They consist of twigs and cane wrapped with fiber cordage or split leaves. In some specimens the cordage bears knots.

38. *Gummed Stick*

One artifact from the Shumla caves appears to be a stick that was used for applying cementing material to artifacts. It is a broken stick with a blob of dried gum at one end. Mason (1893: Plate XXXIX) illustrates a similar specimen.

Artifacts of Bone and Antler

(See Table 2)

1. *Bone Awls*

A total of 54 bone awls was collected from the Val Verde sites, 53 of which are from the Shumla Caves and one from Jacal Canyon. These may be subdivided as indicated below.

TABLE 2
Provenience of Bone and Antler Artifacts

| | <i>Shumla Caves</i> | <i>Eagle Cave</i> | <i>Jacal Canyon</i> |
|------------------------------|-------------------------|-----------------------|-------------------------|
| 1. Bone Awls | 53 | .. | 1 |
| 2. Bone Flakers | 18 | 1 | 2 |
| 3. Antler Flakers | 5 | .. | 1 |
| 4. Bone Wrench | 1 | .. | .. |
| 5. Antler Hammers or Rubbers | 3 | .. | .. |
| 6. Bone Pins (?) | 2 | .. | .. |
| 7. Antler Scrapers | 1 | .. | 1 |
| 8. Scapula Scoop | 1 | .. | .. |
| 9. Scapula Rattles | 5 | .. | .. |
| 10. Bone Rasp | 1 | .. | .. |
| 11. Bone Netting Needles | 2 | .. | .. |
| 12. Antler Atlatl Hook | 1 | .. | .. |
| 13. Bone Needles | 3 | .. | .. |
| 14. Bone Beads | ? | ? | ? |
| 15. Rodent Tooth Pendants | 3 | .. | .. |

a. Split Long-bone Awls with Proximal Ends Smoothly Ground. In outline (see Fig. 7, I-M) the proximal ends vary from straight to convex. The distal ends are sharply pointed and are sometimes constricted as the result of resharpening (K-L). These awls are ground and polished all over, but four specimens (I-K) bear incised decoration on one face of their proximal ends. This consists principally of hatched and cross-hatched lines. In length these awls range from 11.8 to 16.7 cm. The specific Shumla provenience is recorded for 12 of these awls: four specimens from Shumla Cave No. 1 and two specimens each from Caves No. 3, 5, 6, and "Old Shumla." Martin (n. d. b: Plate VIII) has sketches of four of these awls, including three with incised decoration (cf. Fig. 8, I-J).

b. Split Long-bone Awls with Proximal Ends Unaltered. These have been ground and polished and the distal ends are sharply pointed. In length they range from 7.9 to 17.7 cm. Four of these are from Shumla Cave No. 1; two from Shumla Cave No. 3; four from Shumla Cave No. 5; one each from Shumla Caves 6 and 7; two from "Old Shumla;" and one from Jacal Canyon. The remaining 10 are from unspecified Shumla caves.

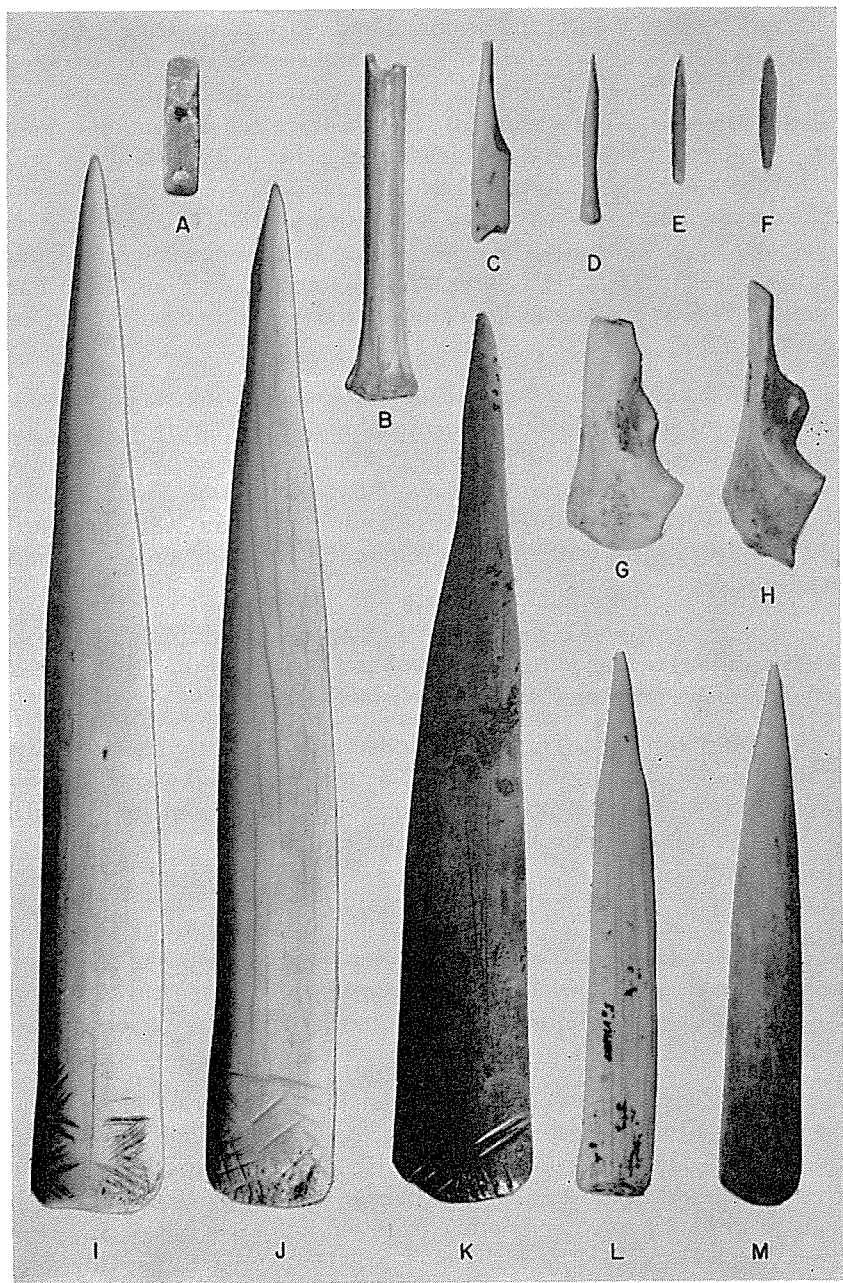
c. Unsplit Long-bone Awl. This single specimen (Shumla Cave No. 7) bears the articular joint on one end and a point on the other. It has a length of 13.5 cm. and is highly polished.

d. Fish Bone Awls. These are unaltered fish bones with naturally pointed distal ends. Articular knobs form the proximal ends. Lengths range from 6.5 to 12.5 cm. All four specimens are from the Shumla caves (one is recorded as from Shumla Cave No. 3).

2. Bone Flakers

Twenty-seven tools seem to have been used in chipping flint and other siliceous stones. Of these, 23 are from the Shumla caves, one is from Eagle Cave, and four are from Jacal Canyon. The various forms are described below.

a. Ulna Flakers. Sixteen flaking tools (Fig. 7, G-H) are made from deer ulnae. In most specimens the proximal articular ends show some wear; the distal ends are wedge-shaped and range in width from 6 to 16 mm. Lengths of these flakers range from 8 to 14 cm. One is recorded from Shumla Cave No. 3, another from Shumla Cave No. 5, and two from Jacal Canyon. The remainder are from unidentified Shumla caves.



b. *Split Long-bone Flaker with Altered Proximal End.* One flaker from Shumla Cave No. 5 is made of split bone, with the proximal end cut and smoothed, the distal end rounded, nicked, and battered from use. The lateral edges are ground to a flat surface on the concave face of this tool. Its length is 6.8 cm.

c. *Split Long-bone Flaker with Unaltered Proximal End.* This specimen, which is from Shumla Cave No. 8, has a length of 13.6 cm. The proximal end is formed by part of the articular end of the bone, and the distal end is round and somewhat smoothed from use. The lateral edges have been ground smooth.

d. *Split Long-bone Flakers with Cut but Unsmoothed Proximal Ends.* The six specimens in this category range in length from 7.6 to 15.8 cm. One specimen is from Shumla Cave No. 5 and another is from Jacal Canyon; the remainder are from unidentified Shumla caves.

e. *Split Rib Flaker.* A single specimen from Zone B of Eagle Cave (Schuetz, 1956) is curved and appears to have been made from a split section of animal rib. The cancellous tissue is visible on one face. The proximal end is diagonally cut and has been beveled on both faces, suggesting use as a scraper. The distal end shows gouge marks, apparently from use as a flaking tool. Near the proximal end are transverse cut marks, possibly made when the bone was diagonally cut. The length of this specimen is 8 cm.

f. *Miscellaneous Flakers.* One flaker (specific provenience unknown) consists of a short bone with unaltered articular head, the opposed end of which has been beveled (through use) in such a way that a triangular plane has developed on one face. A second specimen (specific provenience also unknown) is a flaker made from a reworked awl. The broken proximal end of a split-bone awl was reworked and bears evidence of use as a flaking tool. This flaker has a length of 6.6 cm.

3. Antler Flakers

Six antler tines, ranging in length from 7.6 to 15.8 cm., have cut but unsmoothed proximal ends. The distal ends show traces of use in work-

Fig. 7. Bone and antler artifacts. A, antler atlatl hook; B, bone wrench fragment; C, bone awl; D, bone needle; E-F, bone pins; G-H, ulna flakers; I-M, split long-bone awls with proximal ends smoothly ground. Length of A, 5.4 cm.; B, 13.6 cm.; C-D, to same scale, length of D, 5.7 cm.; E-F, to same scale, length of E, 4.5 cm.; G-H, to same scale, length of G, 8 cm.; I-M, to same scale, length of I, approximately 15 cm.

ing flint. One of these is from Shumla Cave No. 5 and another is from Jacal Canyon. The remaining four are from unspecified Shumla caves.

4. *Bone Wrench*

A long-bone fragment (Fig. 7, B) from one of the Shumla caves indicates that a hole was drilled entirely through the bone by boring from two opposed sides of the shaft. This hole has a diameter of approximately 7 mm. The bone was broken across the perforation. One end of the fragment, which has a length of 13.6 cm., bears the articular surface.

5. *Antler Hammers or Rubbers*

Short thick sections of antler were apparently used as hammers or rubbing tools (Fig. 8, B-D), for their ends are considerably worn. Three specimens were obtained: one from Shumla Cave No. 5 (dimensions 3.7×6.7 cm.), one from Shumla Cave No. 6 (3×12.8 cm.), and one from an unspecified Shumla cave (3.8×5 cm.). One of these is illustrated by Martin (n. d. b: Plate XLIII, 7).

6. *Bone Pins (?)*

Two delicately worked bone artifacts may have served as pins or eyeless needles (Fig. 7, E-F). They are slivers of bone that are round in cross section and pointed at both ends. Both have diameters of 4 mm. and lengths of 4 and 4.5 cm. respectively.

7. *Antler Scrapers*

Two antler objects appear to have been used for scraping purposes and possibly for other purposes as well. One specimen (Fig. 8, A) is complete, the other fragmentary. The complete specimen is a split antler section (length 15.7 cm.) that shows evidences of use on both ends. One end appears to have been used on flat surfaces, but the other seems to have been pressed against convex surfaces. The lateral edges are smooth. The complete specimen is from "Old Shumla," the fragmentary specimen from Jacal Canyon.

8. *Scapula Scoop*

A deer scapula from one of the Shumla caves was apparently used as a scoop or spade, the thin end of the bone being worn and scratched.

9. *Scapula Rattles*

Five deer scapulae from the Shumla caves indicate use in groups as

rattles. Three such scapulae are tied together with fiber cord (Fig. 8, H). The joint of a fourth scapula is encircled by a cord and may originally have been attached to the other three. The cord used is a two-ply, Z-twisted strand made of S-twisted yarns. Martin (n. d. b: Plate XLIII, 5) shows four scapulae joined by cordage, presumably the same four described here. A fifth scapula has a coil of untwisted fiber encircling the joint.

10. Bone Rasp

A curved section of bone, having a length of approximately 14 cm., is notched on the concave edge and probably was used as a musical rasp. This specimen is from one of the Shumla caves.

11. Bone Netting Needles

Two bone needles from the Shumla caves are believed to have been used for making nets or possibly basketry. Both are made from the distal ends of deer metapodia, the articular heads of which are worked down to a blunt, rounded form. The opposite ends in both specimens are ground to tapered points. In one of these (Fig. 8, J) a hole has been drilled through the bottom of the natural cleft in the condyle to connect with the natural groove on the anterior face of the bone. A piece of cord passes through this hole and out into the groove and is wound around the needle for its entire length (17.5 cm.). The proximal end of this needle is heavily coated with gum.

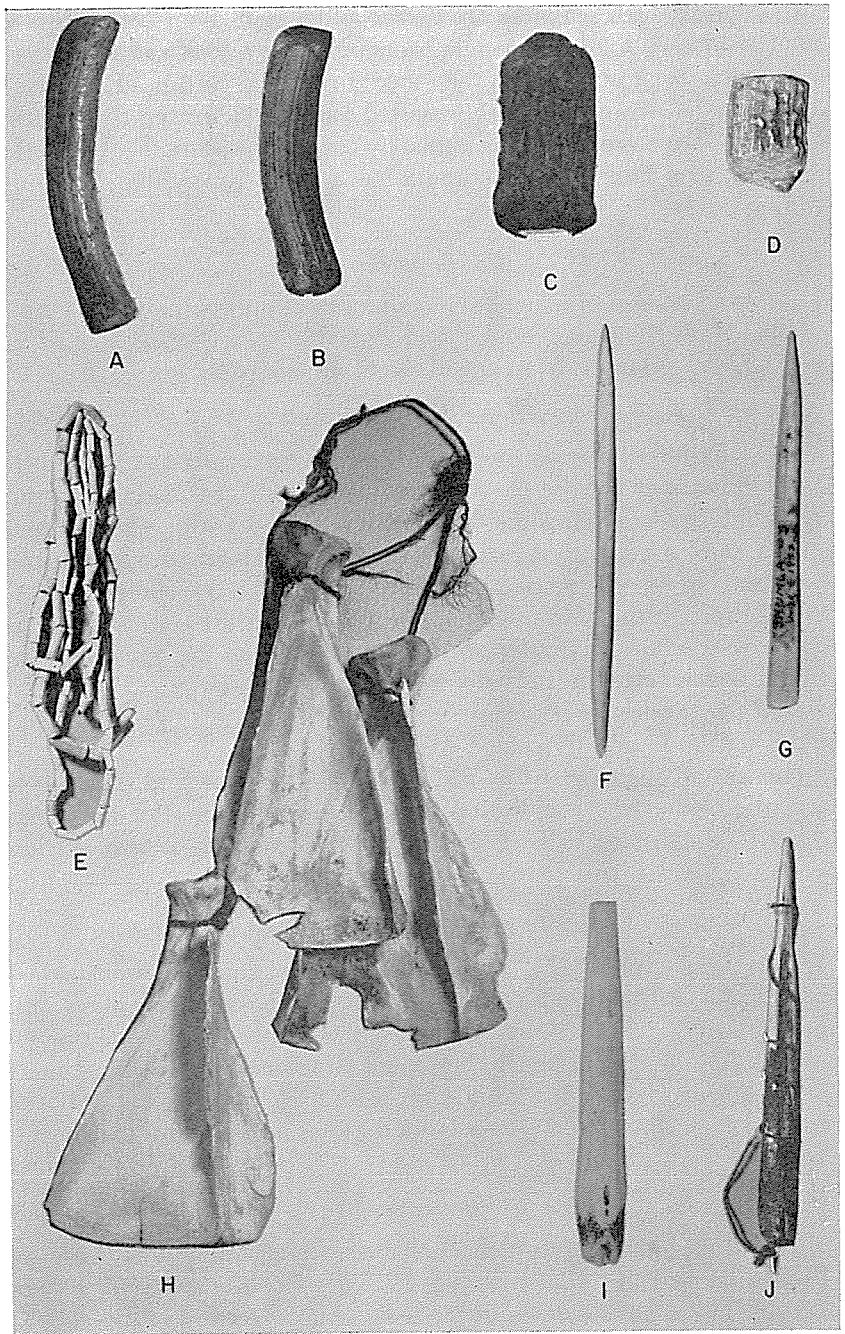
The second specimen (Fig. 8, I) is similar in form and size, but it lacks the connecting perforation through the distal cleft of the metapodium. Martin (n. d. b: Plate XI) shows sketches of two netting needles.

12. Antler Atlatl Hook

A single specimen (Fig. 7, A) was recovered from an undisturbed layer of ash and fiber in Shumla Cave No. 5. It has a length of 5.4 cm. and a width of 1.3 cm. At one end is a carved hook, and in the middle part is a hole that apparently facilitated attachment to the atlatl shaft (also see Martin, n. d. b: Plate IX, 5). This hook is unlike antler hooks reported from the southeastern United States and is a unique find in Texas.

13. Bone Needles

From the Shumla caves there are three slender bone tools (Fig. 7, D and Fig. 8, F-G) that may have been used as needles in basket making. These have lengths of 5.7, 8.8, and 10.1 cm. respectively.



14. Bone Beads

Tubular bone beads were made from the small long bones of birds and mammals. All seem to have been made by encircling the bone shaft with grooves and breaking at these weakened places. The ends of all these beads are ground smooth. A single string of 118 tubular bone beads came from one unspecified Pecos River site (Fig. 8, E). Bone beads were collected from Eagle Cave and the various Shumla caves, but the provenience records are not sufficiently clear to enter figures in Table 2.

15. Rodent Tooth Pendants

One large rodent tooth, apparently used as a pendant, was recovered from Shumla Cave No. 3. Two additional specimens were associated with an infant burial in Shumla Cave No. 1. The proximal ends of these two teeth were cemented to a piece of fine, hard, two-ply fiber cord.

Artifacts of Stone

An analysis of most of the stone artifacts from the Val Verde County sites has already been published (Schuetz, 1956). This previous publication covered projectile points, knives, scrapers, and heavy chipped stone tools, all of which are chiefly associated with hunting activity. A few additional stone artifacts are described below.

1. Grooved Pebbles

Three small pebbles with encircling grooves (Fig. 9, A-C) were found in the Shumla caves. Two (B, diameter 2.5 cm.; C, diameter 2.7 cm.) are of limestone and the third (A, diameter 2.2 cm.) is made of a soft, red ocherous material. These objects may be net sinkers or bolas stones (see Martin, n. d. b: Plate XIII, 6).

2. Perforated Stones

A number of small pebbles with natural perforations (Fig. 9, E) were found in the Pecos River sites. These may have served as net weights. Martin (n. d. b: Plate XIII, 7) has a sketch of one of these pebbles.

Fig. 8. Bone and antler artifacts. A, antler scraper; B-D, antler hammers or rubbers; E, string of 118 tubular bone beads; F-G, bone needles; H, deer scapula rattle; I-J, bone netting needles. A, 15.7 cm. in length; B, 12.8 cm.; F, 10.1 cm.; J, 17.5 cm.

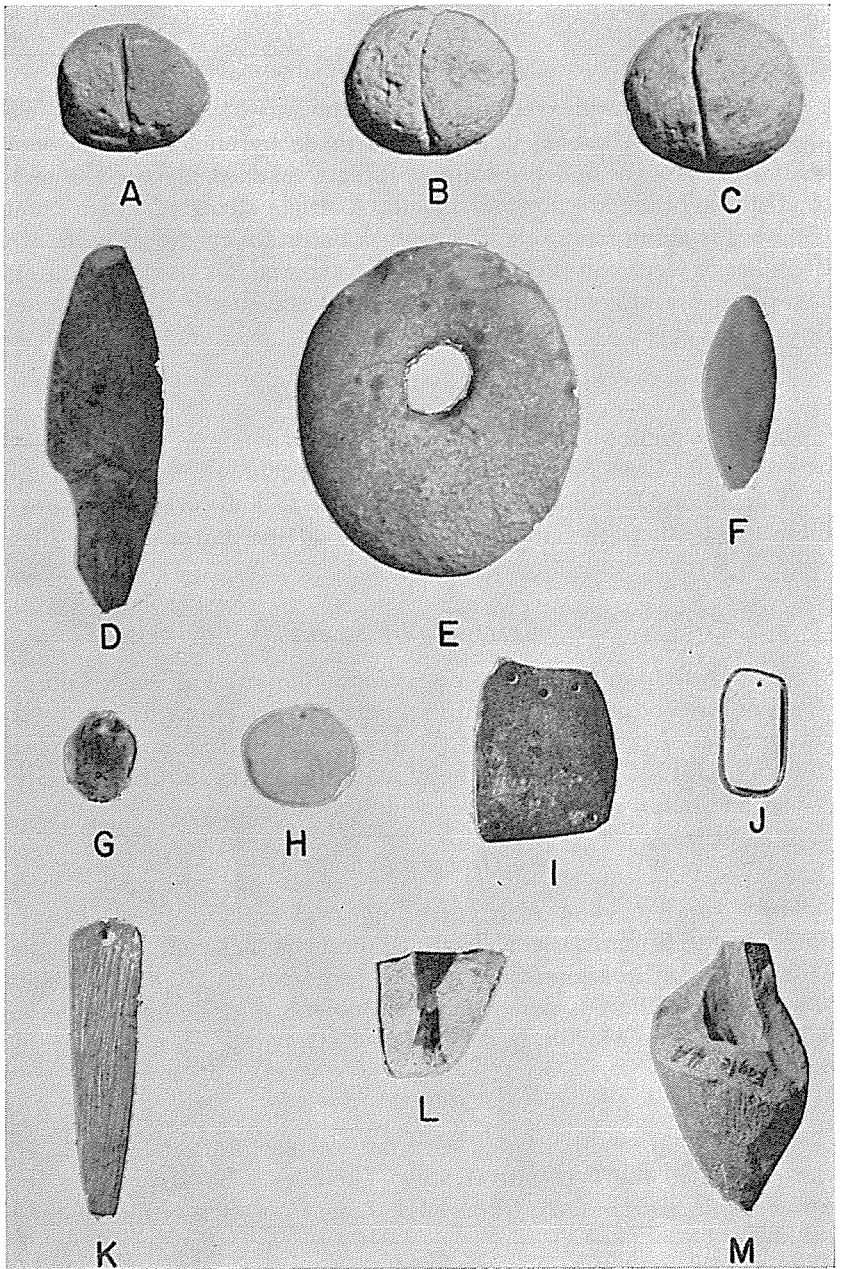


Fig. 9. Artifacts of stone and shell. A-C, grooved pebbles; D, F, cigar-shaped clay objects; E, perforated stone; G, shell pendant; H-K, stone pendants; L-M, tubular stone pipe fragments. A-C, to same scale, B, 2.5 cm. in length; D, 8.7 cm.; E, 5.4 cm.; G-K, to same scale, I, 6.3 cm.; L-M, to same scale, M, 10 cm.

3. *Tubular Stone Pipes*

Parts of five tubular stone pipes were recovered from the Val Verde County sites. Three of these are made of limestone, the others of red sandstone. The most complete specimen (Fig. 9, M), which is made of sandstone, is from the top level of Eagle Cave. Its distal end is missing, the surviving fragment having a length of 10 cm. and a maximum diameter of 5 cm. The remainder of the fragments are from pipes that have been split longitudinally (Fig. 9, L). Martin (n. d. b: Plate XXXV) illustrates one of these tubular pipes.

4. *Stone Pendants*

A brown slate pendant from one of the Shumla caves is rectangular in outline and has five perforations, three at one end and two on the opposite end (Fig. 9, I). Its dimensions are 5.6 by 6.3 cm. In form and material it is similar to stone pendants reported from Archaic sites of central Texas (Jackson, 1941; Schuetz, 1957b).

Another Shumla cave pendant (Fig. 9, J), made of limestone, is also of rectangular outline but bears only one perforation for suspension. This perforation is located near the middle part of one end. The specimen has a length of 3.8 cm., a width of 1.9 cm.

In Jacal Canyon a gray slate pendant was found associated with a burial. This specimen (Fig. 9, K) has an elongated triangular outline (length 10.6 cm., maximum width 3.1 cm.). It bears a single perforation near the base of the triangle; the apical tip is missing.

Another specimen from Jacal Canyon (Fig. 9, H) is a very thin, oval pendant of limestone with a single perforation for suspension. Its maximum diameter is 2.9 cm., its minimum diameter 2.2 cm.

A third pendant from Jacal Canyon, made of very soft red stone and incomplete, appears to have been round originally. The sides are now irregular because six holes were drilled around the periphery and fragments have broken off across the drilled holes. A seventh hole, for suspension, was formed by drilling from both faces of the pendant. The present dimensions of this fragmentary specimen are 1.9 by 3.2 cm. It is rather thick at the center (1.1 cm.).

5. *Stone Beads*

Three well-polished sections of crinoid stems appear to have been used as beads. These specimens are from Shumla Cave No. 7, Eagle Cave, and Jacal Canyon respectively. In length these sections range from 1 to 1.4 cm., in diameter from 2 to 6 mm.

6. *Milling Stones*

Milling slabs are made of sandstone or limestone and bear shallow, basin-like grinding facets. Hand stones are of the single-hand variety, and some have wedge-shaped cross sections. Examples of milling stones are shown in Fig. 10. Provenience records are incomplete, so that frequency figures cannot be given. Bedrock mortars occur on stone outcroppings adjacent to many Pecos River sites.

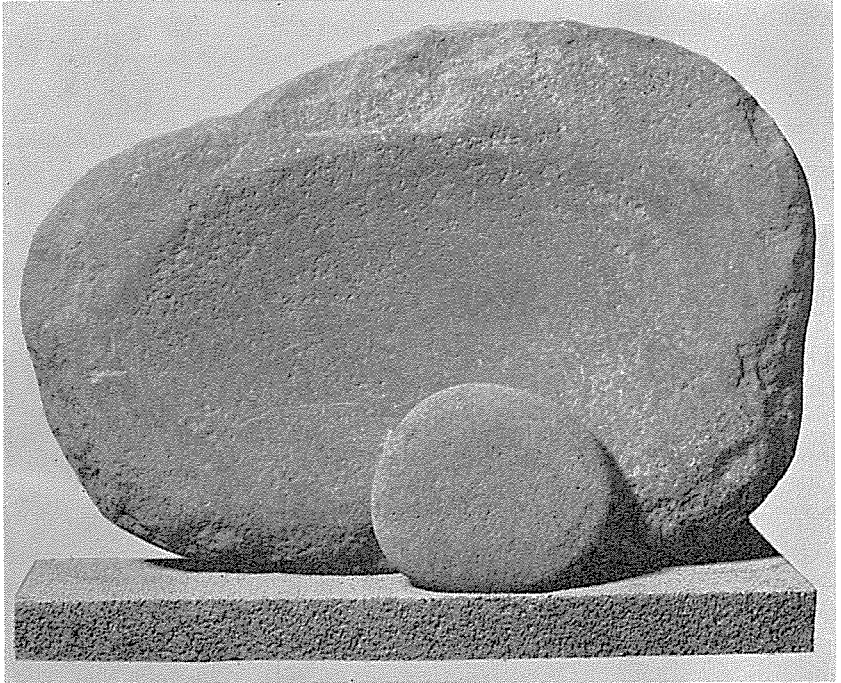


Fig. 10. Milling stones.

7. *Decorated Stones*

Numerous decorated stones occur in all Pecos River Focus sites. Flat stream-worn pebbles are painted with black pigment, although some stones are decorated with red and yellow pigments (Fig. 11, C-G). Martin (n. d. b: Plates XXV, XXVI, XXVII, and XXVIII) illustrates a number of such decorated stones. Eighty-two painted stones were recovered from Eagle Cave, eight from Jacal Canyon, and 30 from the Shumla caves. The Shumla specimens illustrated by Martin are now missing from the collection.

Also found, but not so numerous, are roughly shaped limestone flakes to which leaves of deciduous plants are bound with strips of split sotol leaves (Fig. 11, A-B). Five such stones were recovered from the Shumla caves (see Martin, n. d. b: Plate XXXII). Occasionally a painted stone displays the same wrapping (Davenport and Chelf, 1933: Plate IX, 10). Since manganese was found in the Shumla caves, Martin (n. d. b: 77) has suggested that it was an important source of black pigment. Pieces of red and yellow ocher were also found in these sites. These colors occur more commonly in pictographs of the area than on the painted stones.

8. *Worked Stones*

Two pieces of calcite, one from Eagle Cave and the other from Jacal Canyon, have been altered by human handiwork. The specimen from Eagle Cave has a length of 1.2 cm.; its breadth and thickness are the same, 1.9 cm. It is grooved and may have served either as a pendant or as a net weight. The specimen from Jacal Canyon, with dimensions of 2.2 by 2.2 by .7 cm., is worked but does not bear a groove.

9. *Pictographs and Petroglyphs*

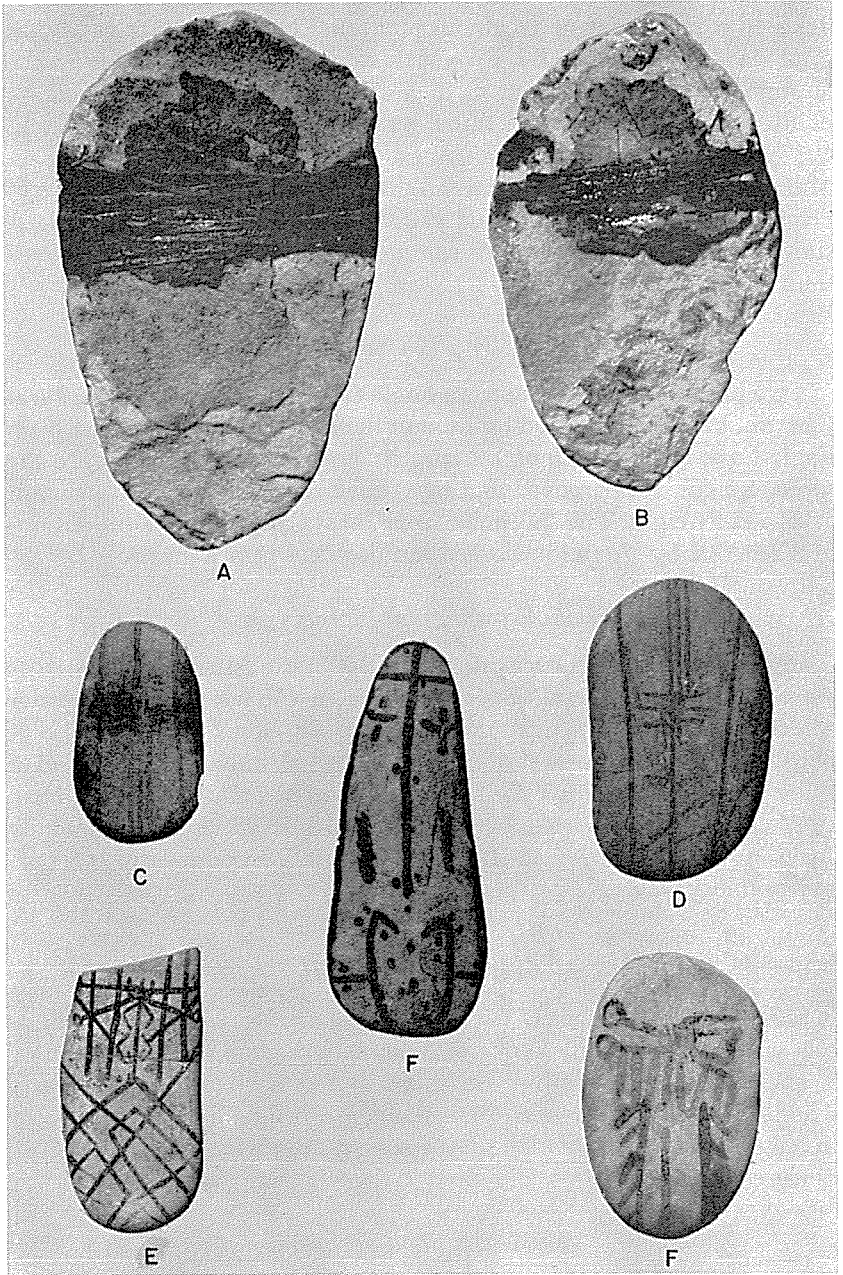
In conjunction with excavations by the Witte Museum, two artists were sent to the lower Pecos River area in 1931 to record in water colors the various carvings and paintings on stone. The portfolio of paintings has never been studied and published, but an examination of these records shows that the petroglyphs and pictographs are from sites visited and reported by Kirkland (1937, 1938, 1939) and by Jackson (1938). A detailed study of the Witte Museum records is currently under way.

Artifacts of Shell

Shell was not commonly used in making artifacts. Freshwater mussels were an important source of food, as indicated by the frequency of shells in the Pecos River sites; but mussel shells rarely show any evidences of use. However, these shells are fragile and usually occur in fragmentary form, which may be one reason why so little evidence of use can be seen.

1. *Mussel Shell Scrapers*

Three mussel shells in the Witte Museum collections from these



sites show wear on their edges. These may have been used as scrapers or small scoops.

2. *Shell Pendants*

A complete shell pendant was found at Eagle Cave. This specimen (Fig. 9, G) has an oval outline and is perforated at one end for suspension. It has a length of 3.1 cm. and a width of 2.5 cm. The shell is rather thick and is clearly foreign to the Pecos area.

Fragments of two mussel shell pendants were also obtained from Eagle Cave. One of these fragments has edges notched at intervals of 3 mm. The surface of the second fragment bears scratches, but these do not form any recognizable design.

Another mussel shell pendant fragment was collected at Jacal Canyon. It also bears random scratches.

3. *Shell Beads*

Large land snails were evidently eaten, judging from the frequency of shells in the Val Verde sites. In "Old Shumla" cave five of these were found on a fiber cord. A necklace of small *Olivella* shells and two rodent teeth pendants were associated with an infant burial in Shumla Cave No. 1.

Artifacts of Clay

Two objects of unfired clay were found in Eagle Cave (Davenport, 1938: 10; Schuetz, 1956). Both are flat and resemble cigars, both ends being pointed. The larger specimen (Fig. 9, D), which is from Zone A, has a length of 8.7 cm. (both ends are damaged, however) and a maximum thickness of 2.5 cm. On one face, and near one end, are five incised lines having lengths of approximately 2.5 cm. Both faces show red stains. The second specimen (Fig. 9, F), which is from Zone B, has a length of 5.4 cm., a width of 1.6 cm., a maximum thickness of 1.1 cm., and is undecorated.

Fig. 11. Decorated stones. A-B, limestone flakes bearing plant leaves held by wrappings; C-G, painted pebbles. A-B, to same scale, A, 7 cm. in length; C-F, to same scale, F, 7 cm. in length.

Artifacts of Skin

1. Skin Sandals

Five sandals from the Shumla caves were made by folding deer skin into rectangles, the folds being held together by the tie strings (Schuetz, 1956; Martin, n. d. b: Plate XLIV, 4, 8, 9).

2. Skin Robes

Processed skins with fur left on may have served as robes or blankets. One specimen was associated with an infant burial described by Martin (n. d. b: 21).

3. Skin Apron

An apron from one of the Shumla caves is made of long strips of hide (width 1.3 cm.) attached to a leather tie string by overhand knots. The maximum length of this apron is 32.5 cm.

4. Tie Strings

Leather tie strings are occasionally used with head bands, sandals, and cradles (see Schuetz, 1956, and appropriate section of this report).

5. Skin Pouches

Small pieces of leather were often used to wrap items for protection and storage. A leather pouch (already described) is attached to a cradle from one of the Shumla caves. A second packet was made by wrapping strips of rawhide (width 1.9 cm.) around an object now lost. Martin (1935) has described three additional rawhide pouches.

6. Skin Fragments with Stretching Holes

Marginal fragments of hide frequently show small stretching holes, indicative of the method of mounting hides for processing.

References Cited

- Aveleyra Arroyo de Anda, Luis, Manuel Maldonado-Koerdell, y Pablo Martinez del Rio
 1956. Cueva de la Candelaria. Volumen I. Memorias del Instituto de Antropología e Historia, V. Mexico, D. F.

Davenport, J. Walker

1938. Archaeological Exploration of Eagle Cave, Langtry, Texas. Big Bend Basket Maker Papers, No. 4. Witte Memorial Museum. San Antonio.

Davenport, J. Walker, and Carl Chelf

1939. Painted Pebbles from the Lower Pecos and Big Bend Regions of Texas. Witte Memorial Museum, Bulletin V. San Antonio.

Gardner, Major Fletcher, and George C. Martin

- n. d. A New Type of Atlatl from a Cave Shelter on the Rio Grande near Shumla, Val Verde County, Texas. Big Bend Basket Maker Papers, No. 2. Witte Memorial Museum. San Antonio.

Jackson, A. T.

1938. Picture-writing of Texas Indians. The University of Texas Publication 3809. Austin.
1941. Pendants and Their Uses. Bulletin of the Texas Archeological and Paleontological Society, Vol. 13, pp. 9-45. Abilene.

Kirkland, Forrest

1937. A Study of Indian Pictures in Texas. Bulletin of the Texas Archeological and Paleontological Society, Vol. 9, pp. 89-119. Abilene.
1938. A Description of Texas Pictographs. Bulletin of the Texas Archeological and Paleontological Society, Vol. 10, pp. 11-39. Abilene.
1939. Indian Pictures in the Dry Shelters of Val Verde County, Texas. Bulletin of the Texas Archeological and Paleontological Society, Vol. 11, pp. 47-76. Abilene.

Martin, George C.

- n. d. a. The Big Bend Basket Maker. Big Bend Basket Maker Papers, No. 1. Witte Memorial Museum. San Antonio.
- n. d. b. Archaeological Exploration of the Shumla Caves. Big Bend Basket Maker Papers, No. 3. Witte Memorial Museum. San Antonio.
1935. Report on Four Shumla Cave Packets. Bulletin of the Texas Archeological and Paleontological Society, Vol. 7, pp. 115-117. Abilene.

Mason, Otis T.

1893. North American Bows, Arrows, and Quivers. Annual Report of the Board of Regents of the Smithsonian Institution, pp. 631-679. Washington, D.C.

Sayles, E. B.

1941. Some Texas Cave Dweller Artifacts. Bulletin of the Texas Archeological and Paleontological Society, Vol. 13, pp. 163-168. Abilene.

Schuetz, Mardith K.

1956. An Analysis of Val Verde County Cave Material. Bulletin of the Texas Archeological Society, Vol. 27, pp. 129-160. Austin.
- 1957a. A Carbon-14 Date from Trans-Pecos Texas. Bulletin of the Texas Archeological Society. Vol. 28, pp. 288-289. Austin.
- 1957b. A Report on Williamson County Mound Material. Bulletin of the Texas Archeological Society, Vol. 28, pp. 135-168. Austin.

Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks

1954. An Introductory Handbook of Texas Archeology. Bulletin of the Texas Archeological Society, Vol. 25. Austin.

Witte Museum
San Antonio, Texas

The Beidleman Ranch Site: An Early Man Kill Site in Stonewall County, Texas

DEE ANN SUHM

In the course of collecting vertebrate fossils from Pleistocene deposits along the Brazos River, the WPA-Bureau of Economic Geology State-Wide Paleontological-Mineralogic Survey excavated two archeological specimens from a fossil bison bone bed. At that time, November-December, 1939, the find attracted little attention, and it was not even mentioned in the final report of the survey (Anonymous, 1941). A re-examination of all available evidence clearly indicates that this excavation had, by accident, uncovered the remains of an Early Man kill site. Since the excavators were preoccupied with paleontological remains and not with the importance of chance artifacts, their field notes are regrettably brief. However, Early Man sites are still uncommon and unquestionably merit description. It is, therefore, the purpose of this paper to report as fully as possible this find made on the J. T. Beidleman Ranch. In reporting the discovery, I am particularly indebted to Richmond L. Bronaugh of Baylor University, Glen L. Evans of Midland, and Josephine Casey of the Bureau of Economic Geology, The University of Texas, for generously supplying me with field notes and observations. Their cooperation has made this paper possible.

Actually, the WPA-Bureau of Economic Geology excavated, under the direction of Evans and Bronaugh, two sites on the Beidleman Ranch. Only Site No. 1, hereafter referred to as the Beidleman Ranch site, yielded evidence of Early Man. It is located in Stonewall County, 5.6 miles north of the junction of Highways 83 and 280, and two miles northeast of Aspermont (Anonymous, 1941: 73). The site was situated on the crest of a low divide between two minor tributaries of the Brazos River. The bone bed (Fig. 1, B) lay in a much eroded pond deposit, apparently of late Pleistocene age. This deposit was shallow, probably under two feet thick. It rested on top of Permian red shale (Fig. 1, A). When the site was revisited in 1945 by Glen Evans, Rich-

mond Bronaugh, and E. H. Sellards, the Quaternary deposit had eroded away, fully exposing the Permian red shale (Bronaugh, personal communication).

All the bones collected are identified as belonging to an extinct variety of bison, and include jaws, vertebrae, leg bones, one skull, and numerous teeth. Unfortunately, the skull lacked the horn cores and the species remains unidentified, although Glen Evans (personal communication) thought that it might be *B. antiquus*. The field notes do not indicate the extent of the bone bed, but do note that most of the bones were in a poor state of preservation. It is likely that man, at least in part, was responsible for this accumulation of bison bones. This site, like so many of the other Early Man localities excavated to date, was probably once the scene of a kill.

The first specimen, an incomplete dart point (Fig. 2, A, A') was found lying slightly above the bone bed and just beneath the surface. At the time of discovery, it was thought to be intrusive and only fortuitously associated with the bison bones. However, several days later a second, complete point (Fig. 2, B, B') was found eighteen inches below the surface among fragmentary bison bones. These points, the second clearly and the first probably, were associated with the main concentration of bone. In view of the typological characteristics displayed by both specimens, there is no reason to doubt the association, or to believe that it was much disturbed prior to excavation.

The incomplete point measures 58 mm. in length, 21 mm. in maximum width (near the break), and 6 mm. in maximum thickness. It appears to be about two-thirds complete and probably had an original length of about 75 mm. Dimensions of the complete point are: 73 mm. in length, 21 mm. in maximum width (across the base), and 6 mm. in maximum thickness. One basal edge has a projection which creates a basal concavity; the other edge, however, is squarish. Chipping on both specimens is predominantly collateral and, on the whole, skillful. Both specimens exhibit faint medial ridges. The complete point flares out toward the base, giving the lateral edges a recurved appearance.

As for typological affiliations, only the complete specimen can be considered with any assurance, although there are suggestions—especially in the uniformity of manufacture—that both points might be classified as the same type. In a comparison with published illustrations and descriptions (Sellards, Evans, and Meade, 1947; Sellards, 1952; 1955; Wormington, 1957) and with specimens housed in the Texas Memorial Museum, the complete point appears to be within



A



B

Fig. 1. Beidleman site. A, Contact of Pleistocene deposit on the Double Mountain Permian in a road cut adjacent to the Beidleman site. B, Exposure of extinct bison bone bed, Beidleman site.

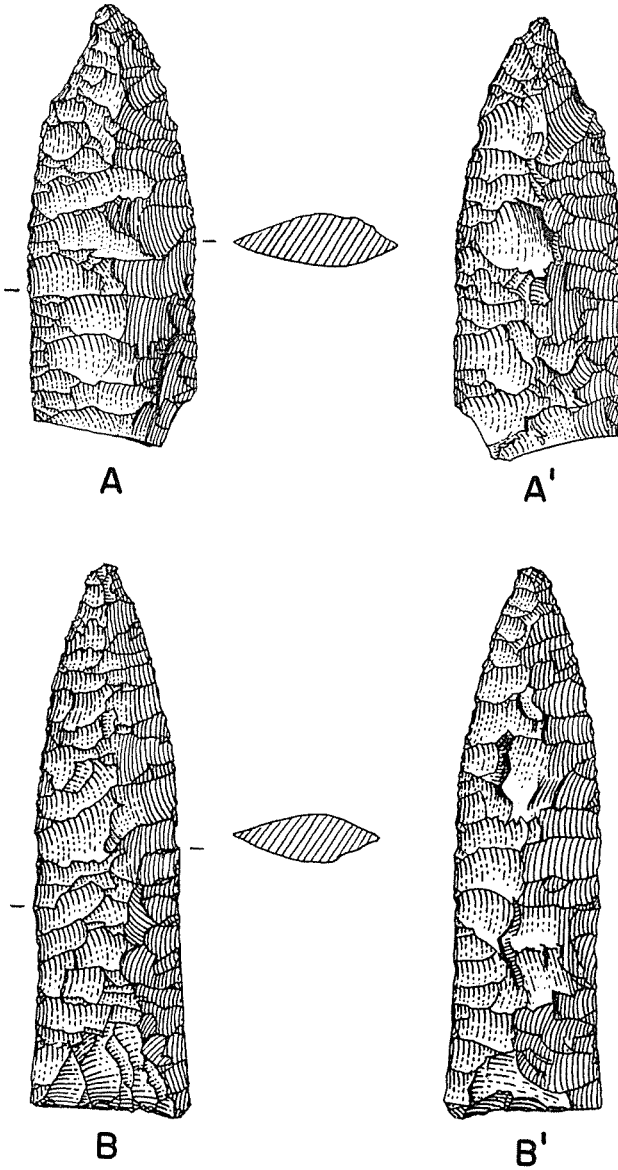


Fig. 2. Two specimens from the Beidleman site. A, A', incomplete dart point. B, B', complete dart point, probably Plainview type, although it also shows affiliations with the Portales Complex.

the range indicated for Plainview points. It is slightly—only a millimeter or so—narrower than points from the Plainview site (Sellards, Evans, and Meade, 1947), and only in this respect seems at variance with that type. On the other hand, this point seems to be virtually identical to certain specimens from the Milnesand (Williamson Ranch) site in New Mexico (Sellards, 1955: Fig. 100, h, i). These particular points from Milnesand are apparently related to, but not clearly identified as, the Milnesand point type. Sellards refers to Milnesand as a square-based point, which does not accurately describe the Beidleman specimen, or several of the points from the Milnesand locality itself. Actually, and perhaps quite wisely, specific type identifications are somewhat vague for points from the Milnesand site (Sellards, 1955), and from a similar assemblage found in Stratum 5 at Blackwater Draw (Sellards, 1952). The entire assemblages from both are grouped by Sellards under the Portales Complex.

While not all of the points illustrated for the Portales Complex are of the Milnesand type (some *could* be classified as Plainview, and others are *suggestive* of Eden and Scottsbluff points), the presence of Milnesand points appears to be essential for a recognition of this complex. So far as the Beidleman point is concerned, it is typologically within the range of Plainview points and, at the same time, compares quite favorably with certain minor forms occurring in the Portales Complex. Thus, considered by itself, the Beidleman site raises the question of the distinctiveness and/or interrelationship between the Milnesand point, the Plainview point, and the Portales Complex. Actually, the Beidleman sample is too small to clarify the problem.

The approximate age of the Beidleman specimens can be inferred from several radiocarbon dates obtained from the Plainview site and from a Portales horizon at the Baxter Ranch site (Krieger, 1957: 322–323) as falling between about 8,000 and 6,000 B.C. A late Pleistocene date is further suggested by the extinct form of bison found at the site.

References Cited

Anonymous

1941. Final Report Covering the Period from March 4, 1939, to September 30, 1941, for the State-Wide Paleontological-Mineralogic Survey in Texas. A Federal Works Agency Projects Administration Project. Published by The University of Texas Bureau of Economic Geology.

Krieger, Alex D.

1957. In: Notes and News: Early Man. *American Antiquity*, Vol. 22, No. 3, pp. 321–323.

Sellards, E. H.

1952. *Early Man in America: A Study in Prehistory*. University of Texas Press. Austin.

1955. Fossil Bison and Associated Artifacts from Milnesand, New Mexico. *American Antiquity*, Vol. 20, No. 4, pp. 336-344.

Sellards, E. H., Glen L. Evans, and Grayson E. Meade

1947. Fossil Bison and Associated Artifacts from Plainview, Texas (with Description of Artifacts by Alex D. Krieger). *Bulletin of the Geological Society of America*, Vol. 58, pp. 927-954.

Wormington, H. M.

1957. *Ancient Man in North America*. Denver Museum of Natural History, Popular Series, No. 4. 4th edition.

Texas Memorial Museum
Austin, Texas

An Archeological Survey of Blackburn Crossing Reservoir on the Upper Neches River*

LE ROY JOHNSON, JR.

Archeological Survey

From July 8 to August 8, 1957, an archeological survey of the area to be affected by the Blackburn Crossing Reservoir was carried out by the Austin, Texas, Office of the National Park Service, River Basin Surveys. This survey was conducted as a part of the inter-agency archeological and paleontological salvage program which is being administered by the National Park Service and the Smithsonian Institution in cooperation with the U. S. Bureau of Reclamation, the U. S. Army Corps of Engineers, and other agencies.

Field reconnaissance—the locating and recording of archeological sites—was carried out by the writer and Mr. W. A. Davis under the general supervision of Mr. Edward B. Jelks. By working through cooperative local informants and by examining much of the area on foot, the survey party succeeded in locating 35 aboriginal habitation and burial sites, several of which promise to be of considerable aid in unraveling and better understanding the complex archeological situation of eastern Texas and adjacent areas. Detailed notes were taken and photographs were made at all sites located. These are now on file at the office of the Texas Archeological Salvage Project in Austin.

Limited testing was done at several of the sites in order to ascertain their stratigraphic structure, and samples of artifacts were collected from the surface at all sites. Tabulations and typological studies of these artifacts are included within this report.

* This paper was prepared by the writer in January, 1958, for the National Park Service, U.S. Department of the Interior, under the title "Appraisal of the Archeological Resources of Blackburn Crossing Reservoir, Anderson, Cherokee, Henderson, and Smith Counties, Texas." The Region Three Office has kindly agreed to release this report for publication in its present form.

Location and Character of the Reservoir

The Upper Neches River Water Authority, whose main office is in Palestine, Texas, is preparing to construct a large earth-work dam across the Neches River at a point 18 air miles southwest of the city of Tyler. This project, to be known as Blackburn Crossing Dam and Reservoir, will provide much needed water for several cities of the area and will aid in water conservation and flood control on the Neches River.

Large areas in Anderson, Cherokee, Henderson, and Smith counties (Fig. 1) are to be inundated by the reservoir, and several major tributary creeks of the Neches—Kickapoo Creek, Flat Creek, Ledbetter Creek, County Line Creek, Saline Creek, and Indian Creek—will be affected, as well as many other lesser streams and minor tributaries.

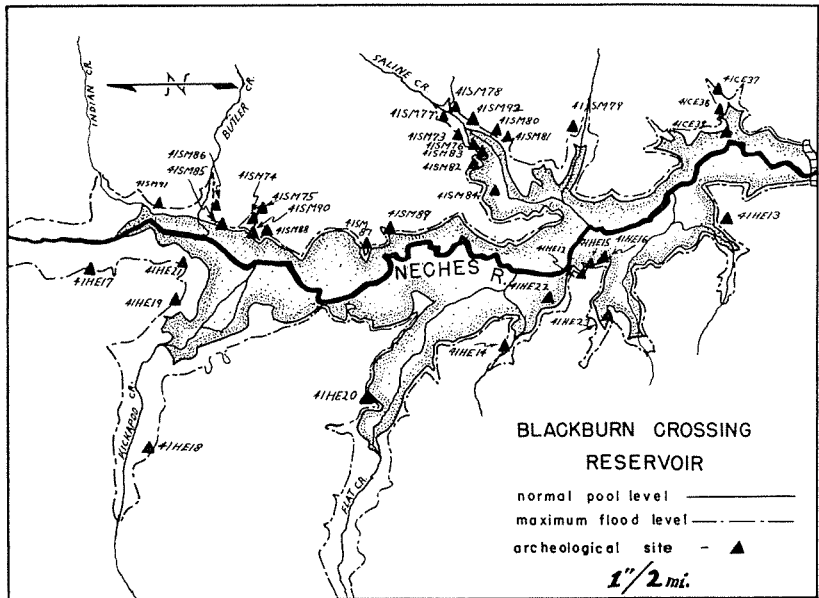


Fig. 1. Map of Blackburn Crossing Reservoir area showing approximate locations of thirty-five archeological sites (pool specifications as of 1957).

The exact dimensions of the conservation pool have not been set. It was originally anticipated that the construction of the dam would be completed by January, 1959, but because of numerous unforeseen difficulties work has not yet been initiated. Furthermore, specifications for the reservoir have been changed, and a much smaller lake than

originally planned is to be built. Thus most of the sites described in this report—although they would have been affected by the larger reservoir—will remain unaffected by the smaller one. Since the change in reservoir specifications eliminated the need for further work in the Blackburn Crossing area, it was deemed advisable to report here the findings of the 1957 survey.

Acknowledgments

To Mr. K. A. Anderson, President of the Upper Neches River Municipal Water Authority in 1957, and to Mr. Eugene Fish, past Secretary of that organization, sincere appreciation is expressed for the encouragement and assistance given in the archeological survey. Much useful information and data concerning the construction of the dam and the size and limits of the reservoir were provided by them.

To the East Texas Archeological Society and its President, Mr. Douglas Proctor, thanks are due for general coöperation and for assistance in locating sites and recording pertinent data. To the following members of that society individual thanks are expressed: to Mr. Sam Whiteside, who spent many days accompanying the survey party and aiding in the reconnaissance; to Messrs. Ray Vanderpool and L. A. Wallace, who conducted the investigators to several sites which they had previously located within the reservoir area; and to Mr. John Mulligan, who permitted examination of the material which he had recovered from site 41SM73, the Joe Meyers Site.

The writer also wishes to express his thanks to Mr. Edward B. Jelks of the Texas Archeological Salvage project, who aided the survey crew in many ways, giving freely of his extensive archeological knowledge of the area.

Description of the Area

The Neches River, with its several tributaries, makes up one of the important drainage systems of East Texas. It arises in Van Zandt County just south of the Sabine River and runs in a general southerly direction through eastern Texas, finally emptying into Sabine Lake near the city of Port Arthur. Close to the Texas coast the broad Neches bottom offers plentiful farm land of high quality and of considerable economic value. In the region of Blackburn Crossing Reservoir, however, the Neches floodplain alternately narrows and widens so that in some areas abundant arable land is provided, while in others the stream is rather entrenched with narrow, constricted banks.

The Upper Neches, including the reservoir area, lies toward the inland limit of Fenneman's Coastal Plains Physiographic Province (Fenneman, 1938), an area of low hills, gently rolling plains, and wide, sluggish streams with little gradient. The region is also included within Dice's Texan Biotic Province (Dice, 1943), but it is situated on its easternmost limits and thus exhibits many of the traits of the adjacent Austroriparian Province. An intermingling of small grassy clearings or glades with strips of mixed deciduous and coniferous woods characterizes the area, and post oak, blackjack oak, hickory, loblolly pine, and short-leaf pine are quite common.

In regard to climate, the area has short and relatively mild winters but long and excessively hot and humid summers. While the annual precipitation is relatively high, most of the rain falls during the long growing season and is thus unevenly distributed throughout the year.

Animal life is abundant through much of the countryside and deer, opossum, squirrel, fox, armadillo, and many other mammals are commonly found in the more wooded areas. Bear and bison were occasionally seen in very early historic times. Likewise, the local streams and lakes support a large variety of fish, and many fowls of varied species can be observed in all parts of the region.

From this brief description of the locale in which Blackburn Crossing Reservoir is to be situated one can readily see that if present conditions can be taken as an indication of what the region was like in times past, the area must have afforded hospitable surroundings for the aborigines. Abundant water, raw materials, arable land, and game were on hand and easily accessible.

Archeological Sketch of the Area

During the 1930-1940 decade the first extensive archeological investigations in eastern Texas were undertaken by the U. S. Government, through the Works Progress Administration (later called the Work Projects Administration), with the collaboration of The University of Texas. Many spectacular and important sites were located and excavated, and thousands upon thousands of artifacts were recovered. Unfortunately, much of this work was done by individuals who possessed only a nodding acquaintance with archeological field techniques, and in many cases adequate field records were not kept. Most of the work was concentrated on the more spectacular phases of excavation (i. e., in uncovering burials, opening mounds, etc.), and these early excavators were generally unconcerned with collecting

stratigraphic evidence for constructing cultural sequences or data which might be employed in a reconstruction of the life-ways of the aborigines.

It can be seen, therefore, that more careful work needs to be done in this area and that many archeologically important problems remain unsolved. Very little is known at present about details of aboriginal life in the region, and the study of typology and culture sequence has only just begun. Since the first draft of this paper was written in 1958, archeological research in the area has accelerated considerably, as the following papers testify: Davis (1958), Davis and Davis (1960), and Jelks and Tunnell (1959) have reported on sites in the Ferrell's Bridge Reservoir area on Cypress Creek; for Iron Bridge Reservoir on the upper Sabine there are site reports by Johnson and Jelks (1958), Duffield (1961), and Duffield and Jelks (1961); Sharrock (1960) has recently reported on a site in nearby Oklahoma. In addition to the aforementioned site reports, an excellent survey of the archeology of the Caddoan Area has been published by Webb (1960).

As it is presently imperfectly understood, the archeological picture of eastern Texas and neighboring areas is as follows (taken primarily from Suhm, Krieger, and Jelks, 1954): The Paleo-American Stage is not represented by a single known site in East Texas, although numerous Plainview, Angostura, and Meserve points are reported from surface collections and rarely in excavated sites. To the following stage, the Archaic, has been assigned a poorly defined East Texas Aspect (or Red River Aspect, as it has been called by Webb [1960]), which is represented by numerous sites, none of which, however, has been extensively investigated or published. The Neo-American, the next stage in the sequence of cultures or "traditions," is well represented in the region and has attracted virtually all of the attention focused on the area up to the present. The Neo-American Stage, here assigned to the "Caddoan Culture," has been divided into two aspects, the Gibson and the Fulton, following the McKern terminology. The Gibson Aspect, generally considered to be the earlier of the two, has been divided into the following foci: Alto, Sanders, Spiro, Gahagan, and Haley, while the later Fulton Aspect has been segmented into many divisions, the major ones being the Texarkana, Titus, Frankston, Mid-Ouachita, Bossier, Belcher, and McCurtain foci.

Blackburn Crossing Reservoir is situated on the northern edge of the Frankston Focus area and some of the major sites of this focus are nearby: the A. C. Sanders, Cook, Daly, Connell, Ellis, and Murphy sites in Anderson County; the Hood and Snow sites in Cherokee

County; and the DeRosset, Miller, and Thrasher sites in Henderson County. No sites of other foci of either aspect have been heretofore recognized in the vicinity.

Following the Neo-American Stage in the East Texas chronology is the Historic Stage with its poorly defined Allen and Glendora foci. The Allen Focus developed out of the Frankston Focus and shares many traits with it, as well as the same geographical area. Several of the more important Allen Focus sites, located directly south of the reservoir, are the Allen and Hackney sites in Cherokee County, and the Patton, Howell, and Freeman sites in Anderson County.

The Caddo were the only people who occupied the immediate area at the time of European contact (Swanton, 1942), although in 1760 the Tawakoni and Yscani were not far away on the headwaters of the Sabine River (Johnson and Jelks, 1958). Of the numerous Caddoan groups in Texas, the Nabiti, Nacachau, Neche, and Nabadache of the Hasinai Confederacy have been located by Swanton (1942) on or near the Neches River to the south of the reservoir and are probably responsible for several of the nearby Allen Focus Sites.

The Reservoir Sites

Except for one small Archaic site, all of the sites recorded by the survey party can be assigned to the Neo-American Stage. One interesting site, 41SM73, belongs to the Alto Focus of the Gibson Aspect and represents the first Gibson site recognized in the immediate area. Most of the others belong to the Frankston Focus of the Fulton Aspect, although some of them may show an earlier occupation by, or influence from, the Sanders Focus.

In designating these sites the three-part numerical system recently adopted by The University of Texas was employed: state number (41) followed by county abbreviation and site number within the county. This system replaces the cumbersome five-part quadrangle system which had been used previously by The University of Texas.

In artifact descriptions the following commonly used terms have been employed: dart point, arrow point, knife, scraper, drill, muller, and grinding slab. One particular class of artifacts merits special definition. This is the so-called "nut stone" or "pitted stone" which is a medium-sized lithic artifact, most often of oxidized sandstone, which has one or more small pits or depressions in either or both faces. These occur both as rough, irregular blocks or as use-rounded implements resembling manos or mullers. No generally accepted hypothesis has yet been put forth to explain the use of these objects.

All projectile point and pottery type names are those set forth in *An Introductory Handbook of Texas Archeology* (Suhm, Krieger, and Jelks, 1954).

Smith County

41SM73, the Joe Meyers Site, is an extremely interesting habitation and burial site situated on a slight rise directly to the west of the floodplain of Saline Creek, one of the important tributaries which flows into the Neches from the northeast. Occupational detritus is found scattered over approximately five acres of a rather large field which has been under cultivation in the past but is now in pasture.

During the spring of 1957 Mr. John Mulligan and several associates of the East Texas Archeological Society located this site and began limited exploratory excavations. Test trenches were run from the southern margin of the site northward and several graves were found. Six single interments were exposed, all containing one individual oriented WNW by ESE with the head to the ESE. All were in extended supine position. Also, one multiple burial containing the remains of probably four individuals was located, and its orientation was presumably the same as that of the single ones. The skeletal material of all the burials was in a very deteriorated condition, and only one skull could be removed by the excavators. It was even difficult to determine the number of individuals in the multiple burial because of the exceedingly poor condition of the bones.

The thing that makes this site of special significance is the burial furniture associated with the interments. In all, 15 complete or fragmentary vessels (which had been placed around the head, feet, or mid-sections of the skeletons) were recovered, representing ceramic types *Bowles Creek Plain*, *Hickory Fine Engraved*, *Weches Fingernail Impressed*, and *Canton Incised*. It can readily be seen from this array of pottery types that here, for the first time, burials of the Alto Focus have been uncovered, unless one wishes to assign the burials found at Gahagan, Louisiana, to that focus (Webb and Dodd, 1939).

Brief notes were taken by the survey party at the site and during an interview with Mr. John Mulligan, and the archeological specimens were examined.

In April of 1957, Mr. W. A. Davis, who was then engaged in conducting a supplementary archeological survey of Ferrell's Bridge Reservoir for The University of Texas, was notified of this discovery on Saline Creek and soon thereafter visited the site, taking brief notes and making a surface collection of artifacts. In the following descrip-

tions the material gathered by Mr. Davis has been included with that collected during the present survey, making a total of 511 artifacts.

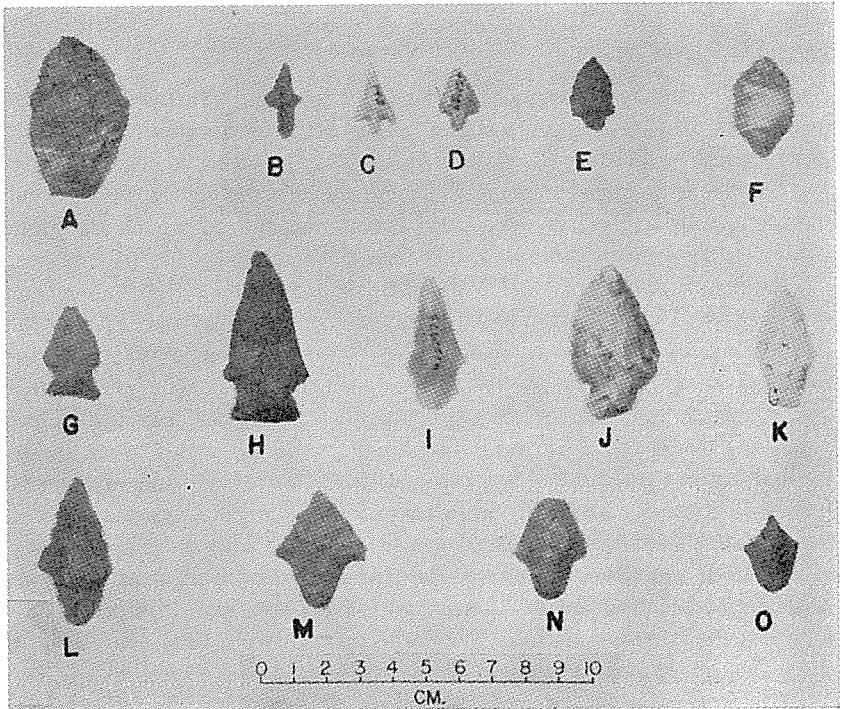


Fig. 2. Chipped stone artifacts from Blackburn Crossing Reservoir. A, bifacial blade; B, Bonham arrow point; C-D, Perdiz arrow points; E, arrow point; F, bifacial knife; G, Edgewood dart point; H, Yarbrough-like dart point; I, Gary dart point; J-K, dart points; L-O, Gary dart points. Site provenience—41SM73: I, O; 41SM76: H; 41SM79: E; 41SM82: C; 41SM89: B, D; 41CE39: L; 41HE12: K; 41HE18: A, F, G, N; 41HE19: J, M.

Among the potsherds collected from the surface of the site are one rim sherd of *Hickory Fine Engraved*, 21 *Davis Incised* (Fig. 3, A-B) rim sherds (some of which have flat lips), 27 *Davis Incised* body sherds, one *Dunkin Incised* body sherd, two *Canton Incised* (Fig. 3, D) sherds, six sherds of *Weches Fingernail Impressed* (Fig. 3, C) (all with flat lips), four body sherds of type *Sinner Linear Punctated* of the Bossier and Haley Foci, 34 body sherds of *Bullard Brushed*, four *Pease Brushed-Incised* body sherds, five brushed body sherds of unknown type, nine miscellaneous incised sherds which could not be identified, 49 fingernail-punctated body sherds, one fingernail-punctated rim sherd, 13 plain rim sherds with flat lips (probably type *Bowles Creek*

Plain), five plain sherds with rounded lips, 320 miscellaneous plain body sherds, one plain red-filmed body sherd, one small body sherd with a trailed design, and one engraved body sherd which could not be assigned to a definite type.

Stone material at this site was not common, and only six lithic artifacts were found: a Gary dart point (Fig. 2, I), a milling slab, two muller fragments, an abrader with pits or small depressions on one face, and a sandstone abrader.

This assemblage of surface artifacts indicates that the primary occupation of the site must be assigned to the Alto Focus as defined by Newell and Krieger (1949), and it is obvious that the burials likewise belong to the same complex.

It is interesting to note that, except for one small sherd, pottery of the type *Dunkin Incised*—generally considered one of the major Alto Focus types—is absent at this site. However, type *Canton Incised*, a somewhat similar type heretofore recognized only in components of the Sanders Focus, was associated with Alto Focus pottery types in the burials. An examination of surface collections made by local amateurs at Alto Focus sites within this area seems to support the hypothesis that in the northern Alto Focus area *Canton Incised* frequently replaces *Dunkin Incised* in Alto Focus components. Controlled excavations will be necessary in order to substantiate this hypothesis.

The occurrence of pottery types *Bullard Brushed* and one vessel of *Poynor Engraved*, found by East Texas Archeological Society members, points to a later occupation of the site by Frankston Focus people, but this occupation was certainly not as strong as that of the Alto Focus. In addition, influences from the Louisiana area are perhaps indicated by the presence of sherds of *Sinner Linear Punctated* and *Pease Brushed-Incised*, but these influences do not seem to have been of any particular magnitude.

Test pits revealed a midden deposit, extending to a depth of two feet below the surface, which overlies a sterile subsoil of red clayey sand. The midden soil is quite rich in bone and shell detritus, and it is entirely possible that house floors or other important features have been preserved in it. There is also an excellent possibility that cultural stratigraphy can be determined from this midden. For instance, it would be important to ascertain whether there has been a continual habitation of the site from Gibson into Fulton Aspect times (assuming that the Frankston Focus component overlies that of the Alto Focus), or whether there is a stratigraphic break or hiatus between these two components. It is hoped that questions such as these can be answered

by excavation and that some of the complex problems of Caddoan Area chronology can be solved.

41SM74 is a small ceramic habitation and burial site located on a low hill to the south of an unnamed stream that flows into the Neches River from the east. A total of 144 artifacts, all potsherds, were collected in an old cultivated field at the site and include the following specimens: two small engraved rim sherds of type *Ripley Engraved* or *Taylor Engraved*, two body sherds of type *Poynor Engraved*, 10 punctated and pinched sherds of *Killough Pinched*, one rim sherd of *Maydelle Incised* (Fig. 3, G), one rim sherd of *Bullard Brushed*, 67 body sherds of *Bullard Brushed*, two plain rim sherds, 51 plain body sherds, one incised body sherd of unknown type, one brushed-incised body sherd which strongly resembles type *Pease Brushed-Incised*, five punctated body sherds, and one unusual sherd with horizontal pinched ridges below the rim.

During March, 1957, two members of the East Texas Archeological Society, Ray Vanderpool and L. A. Wallace, succeeded in locating and uncovering two burials at this site, and found vessels of types *Killough Pinched*, *Poynor Engraved*, and *La Rue Neck Banded*, as well as a typical Frankston Focus effigy bowl. Nothing could be determined with respect to the orientation of the skeletons or the graves because they had been badly disturbed by plowing.

Both the burial furniture and the material collected by the survey party conclusively point to a Frankston Focus occupation of the site, with perhaps some influences from the Titus and Bossier foci.

The midden deposit here, which is fairly deep for sites of this particular area, extends to a depth of 21 inches below the surface. Much bone, shell, and many fine particles of charcoal were observed in the rich, artifact-bearing soil.

41SM75 is a ceramic habitation site located on a low, previously cultivated hill to the east of site 41SM74 and to the south of the floodplain of the small unnamed stream. Forty-six artifacts were found scattered over the northern slope and base of the hill: 21 body sherds of *Bullard Brushed*, two sherds of *Maydelle Incised*, two cross-incised sherds probably of type *Maydelle Incised* but also strongly resembling *Canton Incised*, one incised body sherd of unknown type, three sherds with random punctations, 15 plain body sherds, and one plain rim sherd. The only lithic artifact found was a small sandstone abrader.

This site clearly belongs to the Fulton Aspect, and most likely the Frankston Focus, although none of the characteristic engraved pottery of that focus, necessary for positive cultural identification, was re-

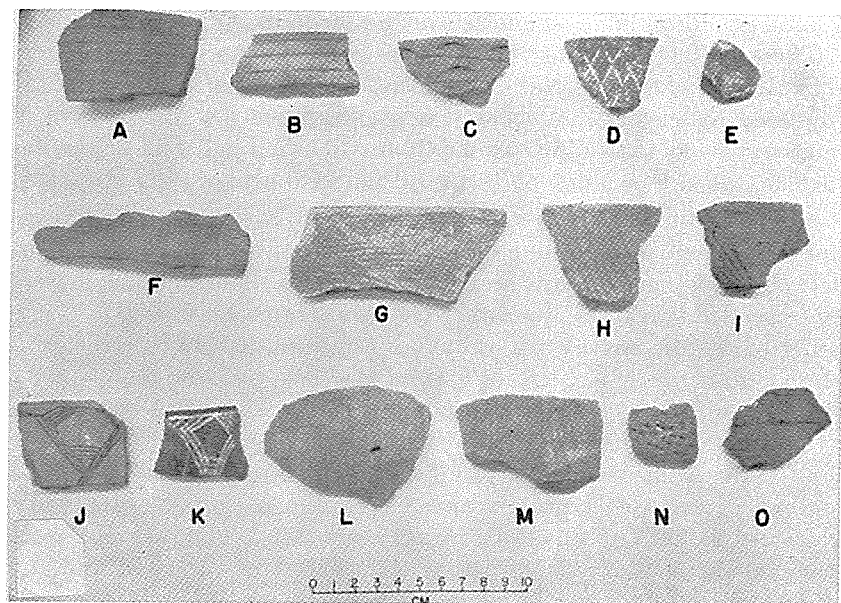


Fig. 3. Pottery from Blackburn Crossing Reservoir. A-B, *Davis Incised* rim sherds; C, *Weches Fingernail Impressed*, punctated rim sherd; D, *Canton Incised* rim sherd; E, *Maxey Noded Redware* sherd; F, *Sanders Plain* rim sherd; G-I, *Maydelle Incised* rim sherds; J-K, *Poynor Engraved* rim sherds; L-M, *Bullard Brushed* body sherds; N, *Maydelle Incised* strap handle; O, *La Rue Neck Banded* rim sherd. Site Provenience—41SM73: A-D; 41SM74: G; 41SM87: F, U; 41SM89: E; 41SM91: H; 41HE16: M; 41HE22: I-L, N-O.

covered. The midden soil is very shallow, in places having been completely removed by erosion.

41SM76 is a ceramic habitation site located directly south of the Joe Meyers site (41SM73) on a low hill adjacent to the west floodplain of Saline Creek. Occupational debris was found scattered over an area of about two acres in a small cultivated field. The 196 artifacts collected by the survey party include the following specimens: 62 body sherds of type *Bullard Brushed*, 11 incised body sherds of *Maydelle Incised*, three plain rim sherds, 96 plain body sherds, four incised rim sherds of unknown type, seven fingernail-punctated body sherds, one fingernail-punctated rim sherd, four engraved sherds too small for type assignment, one engraved rim sherd (very much like *Sanders Engraved* except that it represents a vessel with expanded body instead of the usual *Sanders* carinated bowl), and two small body sherds with white slip, type and origin unknown. The stone material includes a Yarrow-like dart point (Fig. 2, H), two small blades or knives,

a small grinding slab, and a pitted stone shaped like a mano or muller.

These artifacts indicate a Fulton Aspect occupation which can probably be assigned to the Frankston Focus, although none of the typical engraved pottery of that focus was found. Since the midden soil is relatively deep, extending to a depth of two and a half feet below the surface, the site promises to be useful for stratigraphic investigation.

41SM77 is a small ceramic habitation and burial site situated on the west floodplain of Saline Creek near its headwaters. Occupational debris, including potsherds and a few scraps of shell and bone, cover an estimated two acres of a rather large cultivated field. The artifacts collected by the survey party include three plain body sherds, two plain rim sherds, two sherds of *Bullard Brushed*, and one incised body sherd too small for type assignment.

During 1957 Messrs. L. A. Wallace and Ray Vanderpool of the East Texas Archeological Society excavated a large portion of the site and uncovered two burials which held quite a number of pottery vessels and several other interesting artifacts. The burials were oriented in an east-west direction with heads to the east, and the skeletal material lay at a depth of 44 inches below the surface in both cases. Five pottery vessels, mostly of type *Poynor Engraved*, 14 Perdiz arrow points, a small celt, and a large knife made up the burial furniture.

The artifacts collected by the survey party and the grave furniture recovered by the amateurs indicate a Frankston Focus occupation for the site.

41SM78 is a ceramic habitation site located due east of 41SM77, across the Saline and on its floodplain. Seven potsherds were found scattered over a four acre cultivated field. These include two plain body sherds, four sherds of *Bullard Brushed*, and one pinched-ridged body sherd probably of type *Killough Pinched*.

From these specimens the site can tentatively be assigned to the Fulton Aspect and probably to the Frankston Focus, but a sufficient quantity of material is not on hand to completely substantiate this last assignment.

41SM79, a large ceramic habitation site covering an area of approximately 35 acres, is situated on the southern slope of a low hill adjacent to the floodplain of County Line Creek. The 108 artifacts collected by the survey party include two body sherds of *Bullard Brushed*, two sherds which are probably *Maydelle Incised*, one sherd of *Poynor Engraved*, three unidentified engraved body sherds, four punctated body sherds, nine small incised body sherds for which no type assign-

ment could be made, two plain rim sherds, and 76 plain body sherds. The stone material recovered includes an arrow point of unrecognized type (Fig. 2, E), a dart point medial fragment, a small plano-convex scraper, a milling slab, a sandstone abradar, a muller fragment, a pitted stone shaped like a mano, a crude pitted stone, and a fragment of a large celt.

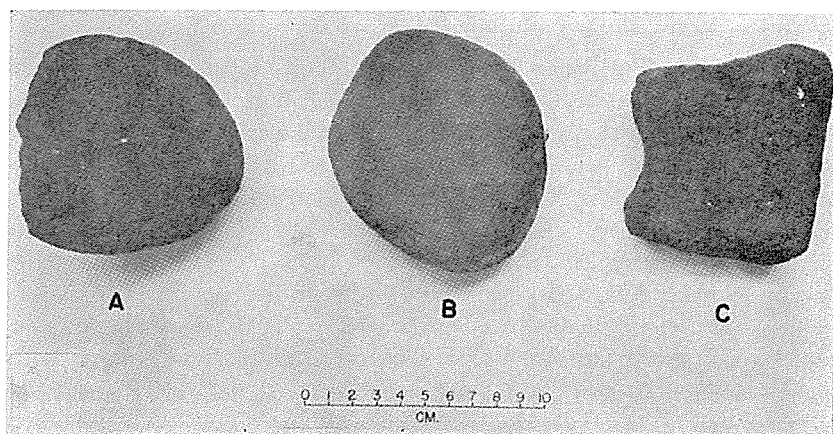


Fig. 4. Stone artifacts from Blackburn Crossing Reservoir. A, muller (41CE39); B, pitted muller (41SM79); C, rough, pitted stone (41CE39).

These artifacts definitely indicate a Frankston Focus, Fulton Aspect occupation of the site.

41SM80 is a small ceramic habitation site located on a low hill or terrace adjacent to the floodplain of Saline Creek on its east side. Twenty-five artifacts were collected from the badly eroded surface of the hill. These include eight sherds of type *Bullard Brushed*, one plain rim sherd, and 15 plain body sherds. Only one lithic artifact was recovered, a small pitted stone.

From these artifacts the site can be assigned to the Fulton Aspect and most likely to the Frankston Focus, although none of the diagnostic wares of this focus are represented. On the summit of the hill the humus-stained sand of the occupation zone extends to a depth of about one foot below the surface; but erosion has cut the slopes down to the clay subsoil, and it is thus obvious that most of the occupation zone has been destroyed.

41SM81, located south of site 41SM80 on a hill overlooking the east floodplain of Saline Creek, is a ceramic habitation site covering about

four acres of a previously cultivated field, now in pasture. This hill seems to have lost its topsoil almost completely as a result of the erosion which normally occurs on abandoned farmland in East Texas, and the surface is now red clayey subsoil.

The eight artifacts recovered by the survey party—indicating a Fulton Aspect, probably Frankston Focus, occupation for the site—are as follows: five sherds of *Bullard Brushed*, one plain body sherd, one pitted stone, and one muller.

41SM82 is a Frankston Focus habitation site located on a low, flat hill above the western floodplain of Saline Creek. The site, covering an estimated two acres of land, has a midden zone which has been little disturbed by erosion, although the site area is in cultivation at the present time. The artifact-bearing midden soil extends to an average depth of 1.4 feet below the surface and overlies a yellow-tan, sterile, sandy subsoil.

The 195 artifacts, both ceramic and lithic, collected from the surface of this site include 65 *Bullard Brushed* body sherds, one *Maydelle Incised* body sherd, six sherds of *Poynor Engraved*, 114 plain body sherds, one plain rim sherd, one incised rim sherd, one incised rim sherd too small for type identification, and one engraved body sherd. The stone material includes one Perdiz type arrow point (Fig. 2, C), one flake side scraper, one pitted stone shaped like a mano or muller, one crude, irregular-shaped pitted stone, and two mullers.

This site would be excellent for extensive excavation because it has a deep occupation zone, exhibits numerous artifacts on the surface, and occupies a relatively small, accessible area.

41SM83 is a small ceramic habitation site which may be assigned to the Fulton Aspect and most likely to the Frankston Focus. It is located on a low hill to the west of the floodplain of Saline Creek just north of site 41SM82. Thirty-five artifacts were collected from the surface: 19 plain body sherds, six body sherds of type *Bullard Brushed*, nine incised body sherds (probably *Maydelle Incised*), and one engraved body sherd which is too small for positive identification.

Although the site has some depth, it is felt that the surface artifacts are of insufficient quantity or quality to justify further work.

41SM84 is a very small ceramic site of uncertain cultural affiliation located in a small cultivated field on a rise directly to the north of the floodplain of Saline Creek. Only five artifacts, all potsherds, were found here: three plain body sherds, one plain rim sherd, and one unidentified engraved body sherd.

Since this site covers only a very small area, and since so little was found, it is quite probable that only a small campsite is represented.

41SM85 is a small ceramic habitation site of unknown cultural affiliation situated on a hill to the east of the Neches River floodplain. The artifact-bearing surface sand at the site seems to have very little depth. Only five insignificant artifacts were recovered: one plain body sherd, one incised body sherd, one barbed dart point fragment, one grinding slab fragment, and one small sandstone abrader fragment.

41SM86 is a ceramic habitation site of unknown cultural affiliation on the north slope of a hill, directly east of the floodplain of the Neches River. This site is rather small and covers only about one acre of a previously cultivated field. The surface soil is a gray sand which extends to a depth of eight inches, at that point coming into contact with the sterile, red, clayey subsoil.

Fifteen artifacts, none of them diagnostic, were collected from the surface. They include eight plain body sherds, two engraved sherds too small for type identification, one small plano-convex end scraper, one muller and two pitted stones. One wattle-impressed daub fragment was also recovered from the surface.

Although only a very few artifacts were found, the occupation zone has some depth.

41SM87 is a rather interesting ceramic habitation site covering approximately five acres of a cultivated field on the west slope of the high ground due east of the Neches River floodplain.

The site consists of a dark midden soil—full of artifacts, mussel shell fragments, and animal bones—which extends to a depth of one foot below the surface. The next zone, a yellow-tan sand member, extends from 1 foot to 2.5 feet and is also artifact bearing, although it contains little shell or bone. The whole is underlain by a red, sandy clay subsoil which is entirely sterile as far as could be determined by the survey party.

A total of 197 artifacts was collected from the surface. These definitely point to a primary occupation of the site by Frankston Focus people with certain hints of an earlier Sanders Focus component. The artifacts include one plain sherd (Fig. 3, F) with scalloped rim and red filming, probably of type *Sanders Plain*, two *Poyner Engraved* body sherds, one *Poyner Engraved* rim sherd, 14 incised body and rim sherds (of which seven particularly resemble type *Maydelle Incised* and another two resemble type *Canton Incised*), 156 plain body sherds, four plain rim sherds, eight punctated body sherds, one punc-

tated rim sherd, seven engraved body sherds too small for type identification, and one incised body sherd with a lug of type *Maydelle Incised*. Only two stone artifacts were recovered, a hammerstone and a pitted stone.



Fig. 5. Grinding slab from Site 41HE14, Blackburn Crossing Reservoir.

41SM88 is a small Fulton Aspect, probably Frankston Focus, site which is located on high ground directly east of the Neches River floodplain. The site covers approximately one-fourth acre of a cultivated field whose surface soil, a deep sandy loam, seems to contain a moderate amount of artifacts. Eighteen specimens were collected by the survey party and these include six brushed body sherds of type *Bullard Brushed*, one incised body sherd of type *Maydelle Incised*, two cross-incised body sherds (also *Maydelle Incised*), five plain body sherds, one plain rim sherd, and one punctated body sherd. The lithic material consists of one muller and one pitted stone.

41SM89 is a moderately large and potentially prolific ceramic habitation site situated on the floodplain of a small unnamed creek which flows into the Neches from the east. Although the site is now in cultivation, the surrounding area is still more or less wooded, with dense thickets scattered throughout. The midden zone at the site is a stratum, rich in artifacts, extending to an average depth of 2 feet below the surface over most of the site. In it were found many potsherds, miscellaneous deer teeth and bones, and numerous small fragments of mussel shell.

In all, 381 artifacts were recovered in the surface collection, and these include 36 body sherds of *Bullard Brushed*; 30 incised body and rim sherds, several of which could belong to either *Maydelle* or *Canton Incised*; one punctated-incised body sherd of type *Bullard Brushed*; one red-filmed body sherd with nodes of type *Maxey Noded Redware* (Fig. 3, E); one sherd of *Sinner Linear Punctated*; 10 small engraved body sherds, mostly too small for type identification, but several of which could be type *Poynor Engraved*; one large body sherd of unknown type with a row of fingernail pinched punctations; one engraved body sherd of unknown type; one punctated-incised body sherd; three punctated rim sherds; 10 punctated body sherds; three plain rim sherds; and 281 plain body sherds. As for the lithic material, only two artifacts, a Bonham arrow point (Fig. 2, B) and a Perdiz arrow point (Fig. 2, D), were found.

It is apparent that the major occupation at this site was by Frankston Focus people, as is evidenced by sherds of pottery type *Bullard Brushed*, *Maydelle Incised*, and *Poynor Engraved*. There is also, however, some indication of an earlier Sanders Focus occupation, for sherds probably assignable to type *Canton Incised* and one sherd of *Maxey Noded Redware* were found. It would be most important if a Sanders Focus occupation could be defined for the Upper Neches area, and it is possible that this site contains a Sanders Focus component in addition to the Frankston Focus one. It is interesting to note that this site is only a short distance east of the other Frankston site which also gave evidence for the presence of an earlier Sanders component, 41SM87.

41SM90 is an important Frankston Focus habitation and burial site situated just west of 41SM74 and due south of a small unnamed stream east of the Neches River floodplain. Here in a cultivated field of some two acres extent Messrs. L. A. Wallace and Ray Vanderpool of the East Texas Archeological Society excavated three burials. All three were oriented in an east-west direction with their heads to the east.

From the three graves were recovered three bottles of *Poynor Engraved*, one engraved Frankston Focus type pipe, three effigy bowls, two large shouldered bowls of type *Poynor Engraved*, and 12 Perdiz arrow points.

The survey party, in making its surface collection at the site, picked up 282 artifacts, including 49 sherds of *Bullard Brushed*, 11 incised sherds of either *Maydelle* or *Canton Incised*, one punctated-brushed sherd of type *Bullard Brushed*, two punctated-incised sherds probably of *Maydelle Incised*, two body sherds of *Poynor Engraved*, 201 plain body sherds, one punctated rim sherd, three punctated body sherds, and 12 unusual engraved sherds, of unknown type, characterized by engraved triangles and vertical panels below the rim.

It can be seen from the burials and the surface collection that this site exhibits traits of both the Frankston and Allen foci and perhaps represents an intermediate period between those two closely related foci. The midden deposit has a depth of about 8 inches.

41SM91 is a large Frankston Focus habitation site located in a cultivated field on the slope of a large hill to the east of the Neches floodplain. Here, in an area of 10 to 15 acres, 282 artifacts were collected, as follows: 148 body sherds of *Bullard Brushed*, one incised sherd with overhanging lines and soft paste like *Coles Creek* or *Chase Incised* of Louisiana, two body sherds of *Killough Pinched*, two body sherds of *Poynor Engraved*, two Frankston Focus type pipe fragments, three punctated rim sherds, eight punctated body sherds, five engraved body sherds too small for positive identification, 10 incised sherds, two of which are type *Maydelle Incised* (Fig. 3, H), seven plain rim sherds, and 92 plain body sherds.

It is interesting to note that the land on which the site is located is only now being put into cultivation, and that some areas of the site yet remain which have not been farmed and which might yield undisturbed occupational features.

41SM92 is a site reported to the survey party after work in the reservoir area was completed and which could thus not be visited. This site is located directly across Saline Creek from 41SM73, the Alto Focus site, and is said to be ceramic. Any future worker in the area should certainly investigate this site.

Cherokee County

41CE37 is a small Fulton Aspect, probably Frankston Focus, site situated on the sloping north bank of Stone Chimney Creek. The site,

which covers an area of approximately one acre, has previously been cultivated but is now in pasture. Erosion has been quite heavy in this particular region, and only small patches of the old surface soil remain.

The 40 artifacts recovered by the survey party include 12 body sherds of type *Bullard Brushed*, three sherds of *Maydelle Incised*, 21 plain body sherds, two milling slab fragments, one muller, and one small chopper.

41CE38 is another ceramic site located on the north bank of Stone Chimney Creek. Here, as in the case of 41CE37, the topsoil is missing and the occupation or midden stratum has been destroyed by erosion. Only five non-diagnostic artifacts were recovered, a sample too small for definite cultural identification. The five artifacts include one body sherd of *Bullard Brushed*, one large dart point fragment of gray chert, one oval muller, and two grinding slab fragments.

41CE39 is the largest site located during the survey. The surface indications are most abundant over an area of 40 acres on a low bluff between the floodplains of the Neches River and Stone Chimney Creek, and sparsely scattered artifacts occur over a much wider area. On the slopes of this bluff the surface soil has been eroded away and the red, clayey subsoil exposed. But on the summit the artifact-bearing midden soil zone extends to an average depth of one foot below the surface and promises to be prolific in artifacts as well as in structural features. Almost all of the site area has been in cultivation at one time or another, but much of it lately has been allowed to revert to pasture and now supports tall, dense grass.

The 258 ceramic and lithic artifacts recovered from the surface definitely indicate the Frankston Focus. There are 85 body sherds of *Bullard Brushed*, nine body sherds of *Maydelle Incised*, three rim sherds of *Maydelle Incised*, two rim sherds of *Poynor Engraved*, five punctated body sherds, three unidentified small engraved body sherds, six miscellaneous incised body sherds, one plain rim sherd, and 112 plain body sherds. Stone material, in contrast to the other sites in the reservoir area, is fairly abundant here. One Gary dart point (Fig. 2, L), five mullers (Fig. 4, A), two crude pitted stones (Fig. 4, C), four use-shaped pitted stones, three crude choppers, five grinding slabs, eight bifacial blades or knives, one sandstone chopper, one small grinding slab or hone, and two small pieces of worked stone were found.

Henderson County

41HE12 is a very small, insignificant site exposed in a road cut on

State Highway 155 to the west of the Neches River. Only two artifacts, a plain body sherd and an unidentified dart point (Fig. 2, K), were recovered.

41HE13 is a ceramic habitation site which can be assigned to the Fulton Aspect, probably Frankston Focus. Fifty-eight artifacts were found scattered over an area of approximately five acres in a cultivated field located on a low hill southeast of Cobb Creek. Included are two punctated body sherds, five incised body sherds, probably *Maydelle Incised*, 25 body sherds of *Bullard Brushed*, two plain rim sherds, and 23 plain body sherds. Only one lithic artifact, a crude bifacial blade or knife fragment, was found.

The site still shows two feet of humus-stained sand overlying a red clay subsoil, although erosion is evident in the immediate area.

41HE14 is a Fulton Aspect—probably Frankston Focus—site located on a low hill directly to the north of the floodplain of Caney Creek, a minor stream which flows into the Neches from the west. The area is now in cultivation, and in many spots the surface zone of artifact-bearing soil—which normally extends to a depth of one foot below the surface—has been eroded away and the red clay subsoil exposed. The 13 artifacts collected by the survey party include three plain body sherds, five body sherds of type *Bullard Brushed*, one bifacial blade or knife fragment, one muller-shaped pitted stone, one muller, one crude, irregular-shaped pitted stone, and one milling slab (Fig. 5).

41HE15 is a Fulton Aspect site, probably belonging to the Frankston Focus, which covers about four acres of the partly cultivated northern slope of a hill directly to the west of the Neches River floodplain. The area has a gray humus-stained sand zone about one foot thick over much of its surface, but deep erosion has removed this soil in many spots. Twenty-seven artifacts were collected: one punctated body sherd, one incised body sherd, probably of *Maydelle Incised*, one incised body sherd of unknown type, one rim sherd of *Bullard Brushed*, 11 body sherds of *Bullard Brushed*, one plain rim sherd, and 10 plain body sherds. Only one lithic artifact, a hammerstone, was found.

41HE16 is a small Fulton Aspect—probably Frankston Focus—site located on the alluvial fan of a high hill directly to the west of the Neches floodplain. Eleven artifacts were recovered: five plain body sherds, three body sherds of *Bullard Brushed* (Fig. 3, M) one crude pitted stone, and two mano-shaped pitted stones.

41HE17 is a ceramic habitation site located west of the Neches River floodplain on the slope of a low hill. The area is in pasture and is so badly eroded that the normal surface soil can be seen only in a few spots. The 15 artifacts found on the surface point to the Fulton Aspect and most likely to the Frankston Focus, although this last assignment cannot be fully substantiated because artifacts diagnostic of that focus were not recovered. Artifacts collected include seven plain body sherds, one plain rim sherd, five body sherds of *Bullard Brushed*, and one punctated body sherd. One dart point, lanceolate-shaped with contracting stem, was found, but no type assignment can be made for it.

41HE18 is a very small ceramic habitation site situated on the north and east slopes of a low hill just south of the bottom land of Kickapoo Creek. Thirty-three artifacts were found in an area of one-half acre. These definitely point to a Fulton Aspect, and probably a Frankston Focus, occupation. They include 20 plain body sherds, two body sherds of *Bullard Brushed*, two incised body sherds (probably *Maydelle* or *Canton Incised*), and one engraved sherd that is too small for type identification. The lithic artifacts include an Edgewood dart point (Fig. 2, G), a Gary dart point (Fig. 2, N), a lanceolate, contracted base dart point of unknown type, a flake side scraper, four small crude bifacial knives (Fig. 2, A, F), and numerous chips and sundry artifact fragments.

41HE19 is a very small non-ceramic site of the East Texas Aspect, Archaic Stage, located on the badly eroded southern slope of a low hill to the north of the Kickapoo Creek floodplain. Only five artifacts were found: a Gary dart point (Fig. 2, M), an unidentified dart point fragment (Fig. 2, J), a small oval bifacial blade or knife, and two miscellaneous worked stone artifact fragments. This is the only Archaic site located by the survey party.

41HE20 is a Fulton Aspect, probably Frankston Focus, habitation site located on the eastern and southern slopes of a hill directly to the north of the Flat Creek bottom land. The 32 artifacts recovered include 14 plain body sherds, 16 body sherds of *Bullard Brushed*, and two unidentified worked stone artifact fragments.

41HE21 is another of the small Fulton Aspect sites which probably belong to the Frankston Focus. It is located on the east slope of a prominent hill above the west floodplain of the Neches River. Only two artifacts, one plain and one brushed-incised body sherd, were found.

41HE22, located in an old cultivated field on the high ground di-

rectly to the west of Caney Creek and the Neches River floodplain, is one of the most prolific sites located in the reservoir area. A total of 370 artifacts was recovered from its surface. This includes 174 *Bullard Brushed* body sherds (Fig. 3, L), one *Bullard Brushed* rim sherd, four body sherds of *Killough Pinched*, 28 sherds of *Maydelle Incised* (Fig. 3, I), three punctated-incised body sherds of type *Maydelle Incised* (Fig. 3, N), 15 *Poynor Engraved* rim and body sherds (Fig. 3, J-K), one corrugated rim sherd of type *La Rue Neck Banded* (Fig. 3, O), one effigy figure from a Frankston Focus type effigy bowl, 136 plain body sherds, five plain rim sherds, one punctated body sherd, one engraved body sherd too small for type identification, and numerous chert flakes and chips.

These specimens clearly indicate a Frankston Focus occupation, and they exhibit a diversity of types and forms not shown at many other Frankston Focus sites in the immediate area. The midden soil at the site extends to a depth of 16 inches and is rich in animal and shell remains, as well as stone flakes and artifact fragments.

41HE23 is a site reported to the survey party after the work at Blackburn Crossing Reservoir was completed, and was therefore not visited. It lies on the north floodplain of Ledbetter Creek, and it is said that potsherds and other artifacts may be found over a vast area. Any future workers in that area should certainly conduct an investigation of this site.

Summary Statement

During the course of the 1957 survey of Blackburn Crossing the land in and around the proposed reservoir was intensively reconnoitered, with the result that 35 archeological sites were discovered and recorded (Table 1). Although some sites were undoubtedly overlooked, most of the area was thoroughly examined, and it is felt that the sites found provide a representative picture of the local archeological situation.

One Archaic Stage site and 34 ceramic, Neo-American Stage sites were located. No Paleo-American or Historic Stage sites were discovered, although several historic sites belonging to the Allen Focus are known immediately to the south of the proposed reservoir.

The single Archaic site, 41HE19, is small and insignificant and cannot be assigned to any particular cultural unit, although nearly all of the Archaic sites in adjacent counties seem to belong to the Red River Aspect (the East Texas Aspect of Suhm, Krieger, and Jelks [1954]).

TABLE 1

Cultural Affiliations of Blackburn Crossing Reservoir Sites

| <i>Site</i> | <i>Cultural Affiliation</i> |
|-------------|---|
| 41SM73 | Gibson Aspect, Alto Focus Fulton Aspect, Frankston Focus |
| 41SM74 | Fulton Aspect, Frankston Focus |
| 41SM75 | Fulton Aspect, Frankston Focus (?) |
| 41SM76 | Fulton Aspect, Frankston Focus |
| 41SM77 | Fulton Aspect, Frankston Focus |
| 41SM78 | Fulton Aspect, Frankston Focus (?) |
| 41SM79 | Fulton Aspect, Frankston Focus |
| 41SM80 | Fulton Aspect, Frankston Focus (?) |
| 41SM81 | Fulton Aspect, Frankston Focus (?) |
| 41SM82 | Fulton Aspect, Frankston Focus |
| 41SM83 | Fulton Aspect, Frankston Focus (?) |
| 41SM84 | Ceramic, cultural affiliation unknown |
| 41SM85 | Ceramic, cultural affiliation unknown |
| 41SM86 | Ceramic, cultural affiliation unknown |
| 41SM87 | Gibson Aspect (?) Fulton Aspect, Frankston Focus |
| 41SM88 | Fulton Aspect, Frankston Focus (?) |
| 41SM89 | Gibson Aspect (?) Fulton Aspect, Frankston Focus |
| 41SM90 | Fulton Aspect, Frankston Focus (?) |
| 41SM91 | Fulton Aspect, Frankston Focus |
| 41SM92 | Not visited, cultural affiliation unknown |
| 41CE37 | Fulton Aspect, Frankston Focus (?) |
| 41CE38 | Fulton Aspect, Frankston Focus (?) |
| 41CE39 | Fulton Aspect, Frankston Focus |
| 41HE12 | Ceramic, cultural affiliation unknown |
| 41HE13 | Fulton Aspect, Frankston Focus (?) |
| 41HE14 | Fulton Aspect, Frankston Focus (?) |
| 41HE15 | Fulton Aspect, Frankston Focus (?) |
| 41HE16 | Fulton Aspect, Frankston Focus (?) |
| 41HE17 | Fulton Aspect, Frankston Focus (?) |
| 41HE18 | Fulton Aspect, Frankston Focus (?) |
| 41HE19 | Archaic (?) |
| 41HE20 | Fulton Aspect, Frankston Focus (?) |
| 41HE21 | Fulton Aspect, Frankston Focus (?) |
| 41HE22 | Fulton Aspect, Frankston Focus |
| 41HE23 | Not visited, cultural affiliation unknown |

Even in the region surrounding the reservoir, Archaic sites are comparatively rare as compared with ceramic sites.

The pottery collections from 34 ceramic sites in Blackburn Crossing Reservoir reveal a great predominance of Frankston Focus, Fulton Aspect, types. Indeed, it seems that the reservoir is in the heart of

Frankston Focus country, even though a great quantity of sites of this focus are known from slightly farther south, from Anderson and Cherokee Counties. While the ceramics of this archeological complex are already fairly well known, very little work has been done on occupational features within Frankston Focus sites, most of the emphasis having been placed on burial excavation. In view of the fact that so little has been published on this archeological unit, it is hoped that many of the Blackburn Crossing sites can be thoroughly investigated. This would seem to be a fruitful area for future research.

In spite of the fact that all of the 34 ceramic sites mentioned above evidenced some Frankston Focus ceramic types, one of them (41SM89) showed strong Sanders Focus, Gibson Aspect, affiliation as well. This site is located near the southern margin of the Sanders Focus area (although a few sherds from the Davis Site in Cherokee County [Newell and Krieger, 1949: 137] and from the Asa Warner Sites just south of Waco, Texas [Watt, 1956], occur slightly farther to the south than Blackburn Crossing).

Another of the ceramic sites yielded several Alto Focus burials and ceramic vessels in addition to some Frankston Focus ceramics. This site, 41SM73, has been partially excavated by various members of the East Texas Archeological Society, but has not yet been reported in print. The simplicity of form and design, as well as crudeness in execution, of the ceramics from this site is in sharp contrast to the well-made wares found at the George C. Davis Site, type site for the Alto Focus. Also, there is an absence of large architectural structures or occupational features at the site. This, along with crude artifact workmanship, would lead one to think that 41SM73 is either an extremely early, proto-Alto site or else an outlying village to the big Davis Site ceremonial center. In view of the nature of the finds made there—no other Alto Focus sites are known from the immediate area—extensive excavations should some day be carried out at the site.

Since the efforts of the 1957 field survey crew were limited to reconnaissance and to the superficial collecting of artifacts, not a great deal can be said about the sites which were encountered. Yet since no archeological salvage excavations are scheduled for the area in the immediate future—because the specifications for the lake have been considerably reduced—it was deemed advisable to make available in the present paper the small amount of useful information that has been acquired. It is hoped that eventually many of the interesting sites located can be thoroughly investigated by professional archeologists and that interested amateurs and laymen will aid in preserving them

for future research. Here we have an excellent opportunity to expand our limited knowledge of Frankston Focus sites and, perhaps, to relate this complex to the earlier Sanders and Alto foci, which also seem to be represented in the area.

References Cited

- Davis, E. Mott
 1958. The Whelan Site, A Late Caddoan Component in the Ferrell's Bridge Reservoir, Northeastern Texas. Unpublished report to the National Park Service, on file at the Regional Office of the National Park Service, Santa Fe, New Mexico, and at the Department of Anthropology, The University of Texas, Austin.
- Davis, William A., and E. Mott Davis
 1960. The Jake Martin Site: An Archaic Site in the Ferrell's Bridge Reservoir Area, Northeastern Texas. *Archaeology Series*, No. 3, Department of Anthropology, The University of Texas, Austin.
- Dice, L. R.
 1943. *The Biotic Provinces of North America*. University of Michigan Press. Ann Arbor.
- Duffield, Lathel F.
 1961. The Limerick Site at Iron Bridge Reservoir, Rains County, Texas. *Bulletin of the Texas Archeological Society*, Vol. 30 (for 1959), pp. 51-116.
- Duffield, Lathel F., and Edward B. Jelks
 1961. The Pearson Site: A Historic Indian Site in Iron Bridge Reservoir, Rains County, Texas. *Archaeology Series* No. 4, Department of Anthropology, The University of Texas, Austin.
- Fenneman, N. M.
 1938. *Physiography of Eastern United States*. McGraw-Hill. New York.
- Jelks, Edward B., and Curtis D. Tunnell
 1959. The Harroun Site: A Fulton Aspect Component of the Caddoan Area, Upshur County, Texas. *Archaeology Series*, No. 2, Department of Anthropology, The University of Texas, Austin.
- Johnson, LeRoy, Jr., and Edward B. Jelks
 1958. The Tawakoni-Yscani Village, 1760: A Study in Archeological Site Identification. *The Texas Journal of Science*, Vol. 10, No. 4, pp. 405-422.
- Newell, H. Perry, and Alex D. Krieger
 1949. The George C. Davis Site. *Memoirs of the Society for American Archaeology*, No. 5.
- Sharrock, Floyd W.
 1960. The Wann Site, Lf-27, of the Fourche Maline Focus. *Bulletin of the Oklahoma Anthropological Society*, Vol. 8, pp. 7-48.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
 1954. An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 25.

Swanton, John R.

1942. Source Material on the History and Ethnology of the Caddo Indians. Bureau of American Ethnology, Bulletin 132.

Watt, Frank H.

1956. Archeological Materials from the Asa Warner Sites. *Central Texas Archeologist*, No. 7, pp. 6-29.

Webb, Clarence H.

1960. A Review of Northeast Texas Archeology. In: Jelks, Edward B., E. Mott Davis, and Henry B. Sturgis (editors), *A Review of Texas Archeology: Part 1*. *Bulletin of the Texas Archeological Society*, Vol. 29 (for 1958), pp. 35-62.

Webb, Clarence H., and Monroe Dodd, Jr.

1939. Further Excavations of the Gahagan Mound; Connections with a Florida Culture. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 11, pp. 92-127.

The University of Texas
Austin, Texas

The Crumley Site: A Stratified Burnt Rock Midden, Travis County, Texas

COL. THOMAS C. KELLY

Introduction

The central drainage areas of the Guadalupe, Colorado, and Brazos rivers of Texas abound in prehistoric camp sites. Many are characterized by accumulations of burnt limestone rock, cooking and flint workshop debris and, generally, considerable quantities of flint projectile points, knives, scrapers, manos, and other tools of a hunting and gathering people. These are especially numerous in the "hill country" of the Edwards Plateau. Hundreds of them have been explored, poked into, and "pot-holed" by curious individuals, but relatively few have been scientifically excavated and published (see "Inventory of Excavated Sites in Central Texas" in Suhm, 1960: 89–103).

These burnt rock middens are ascribed to the Edwards Plateau and Central Texas aspects. The long-lived Edwards Plateau Aspect (Archaic Stage) is supposed to have existed from about 5000 B.C. to A.D. 1200 (Kelley and Campbell, 1942; Suhm *et al.*, 1954). The main outlines of the Edwards Plateau Aspect are fairly well known, but the local variations (foci) and their temporal placement have long been controversial (Suhm, 1960). This is largely because so few stratified Edwards Plateau sites have been extensively excavated and properly published.

Excavation at the Crumley site revealed that it had been occupied for a long period of time by Edwards Plateau Aspect peoples, and also that there had been significant changes in artifact styles, particularly in projectile points, throughout this occupation. The information accumulated helps to resolve a number of questions that have been under discussion for the past two decades.

Site Description

The Crumley site (41TV86) is located 17 airline miles west of Aus-

tin on the Ewell Crumley ranch in Cedar Valley. It consists of a midden that lies at the base of a steep limestone hill adjacent to Long Branch Creek, a tributary of Barton Creek. Some two hundred yards downstream from the midden the creek encounters a sheer limestone bluff and bends sharply to the south. Here in the Edwards formation is a deep pool (Fig. 1) that is fed by springs that rarely dry up even



Fig. 1. Spring-fed pool near Crumley site.

in drought years. The area is still a game paradise. Deer, turkeys, rabbits, raccoons, and squirrels are plentiful, and skunks, armadillos, rattlesnakes, foxes, coyotes, and wildcats are occasionally seen. Bass and perch from the pool augmented the digging camp diet.

The hill above the midden is well covered with live oak, cedar, and juniper trees, and along the stream are pecan, hackberry, chinaberry, persimmon, and cottonwood trees. The steep hillside with its outcropping limestone ledges seems to have been crudely mined for the limestone and flint that make up so large a part of the midden. Reconnaissance of the immediate area failed to reveal any other sources of flint, and its availability may have been a factor in the original selection of this site. Enough tools and cores with limestone on one or both faces were found in the midden to lend credence to this interpretation.

This site was noted by Mr. Bill Belk of Austin after Mr. Crumley

had a bulldozer clear an area of heavy brush and timber in order to increase the size of his bottom-land corn field in the fall of 1959. Burnt limestone rock, which originally was covered by alluvium, had been spread by the bulldozer over an area of about 25 by 50 yards. Mr. Belk had collected dart points from the surface of this field for more than 20 years, but was not aware of a buried midden. In January, 1960, Mr. Belk introduced me to Mr. Crumley and assisted me in securing entry rights to the site.

Considerable damage had been done to the midden by bulldozer and plow, for flint artifacts were scattered through the dispersed burnt rock. However, two test pits (D-4 and D-5 in Fig. 2) revealed that a large portion of the midden was undisturbed, contained artifacts in abundance, was stratified, and showed changes in artifact styles.

Mr. Crumley pointed out an area beginning approximately 20 feet south of the east-west fence (later used as a zero reference line for north-south measurements) that had risen as a mound about four feet above the surface. This mound area had been removed for 20 feet south and 10 feet east and west of the arbitrary line that we used for east-west measurements (Fig. 2). For 15 feet south of this fence there was no disturbance of the very rich, black, top soil. For the next

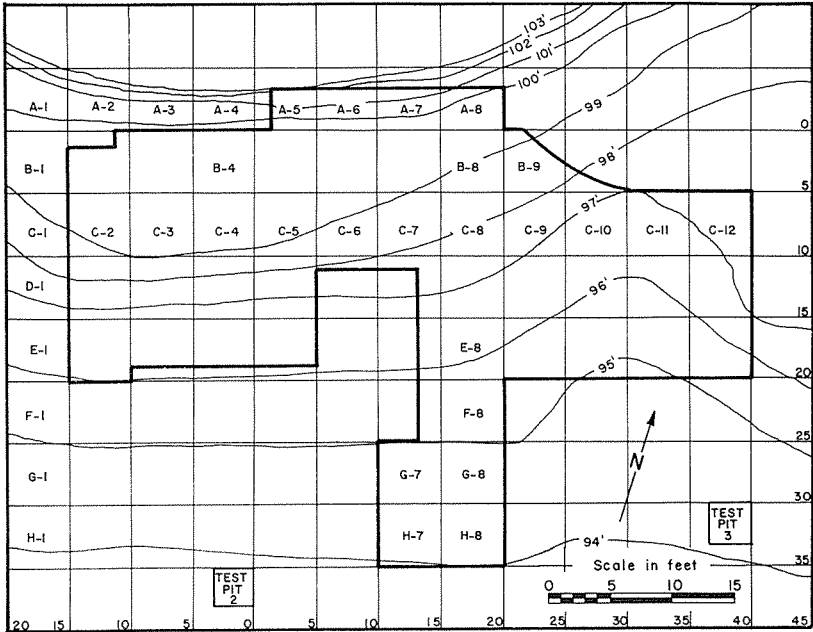


Fig. 2. Contour map of Crumley site, showing grid system and area excavated.

five feet south only the top soil had been disturbed, generally leaving a very thin layer of top soil over burned rock. From 20 to 40 feet south large quantities of burned rock from the mound were spread out over the field.

It was on this northern 20 feet, or approximately one-half of the original midden, that excavation was concentrated. The only surface feature in this area was a block of limestone in Square B-7. North of the fence limestone rose out of the top soil steeply to form the hillside.

Excavation

An arbitrary grid system of 5-foot squares was established about a key point, the staple holding the bottom barbed wire on a centrally located fence post on the north edge of the midden. E. Mott Davis and Curtis Tunnell provided transit, stadia rod, tapes, and most of the labor in establishing the grid system. Squares were identified by number and letter. Three squares were excavated by six-inch levels and screened through one-third inch mesh screen. Extreme difficulty was encountered in digging by this method because of the irregular rocks in a hard matrix. It was also noted that the stratigraphic picture was confused when all artifacts from a given level in a square were thrown together.

It was far more rewarding to dig by the vertical face method. Artifacts were located *in situ*, immediately assigned a catalogue number, and recorded precisely within the grid and by depth below the surface of the square. Several checks in which back dirt from a square was screened indicated a loss of less than 5 per cent of the artifacts by this method. For the man hours expended, a far larger sampling was obtained than would have been possible by using other methods. On two week-ends, when the work force totaled 21, square number and depth of artifact only were recorded. Less satisfactory data were obtained.

Flint flakes that were not readily identifiable in the field as artifacts were saved in milk cartons by square number only. Portions of dart points and knives that could not be classified were treated in the same way. Bone was handled in separate cartons.

Accurate profiles were drawn, using line level measurements for every five feet of progress of the vertical face. A total of 44 five-foot squares and four sections 5 by 3 feet were excavated to an average depth of 36 inches, or approximately 3,500 cubic feet. Occupational debris was found from a minimum of 12 inches on the southern disturbed edge of the midden to a maximum of 62 inches in the north-

ern undisturbed section. Four undisturbed check squares were left at the western end of the site. Artifacts were still being found at the east end on the last day of excavation, but these were beyond the area of stratified burned rock. It is estimated that the original volume of the midden was about 8,000 cubic feet.

No hearths or other features were noted, except for an area of extremely black, greasy earth, comparatively free of burned rock, in Squares F-8, G-8, and H-8. A limestone block (2.5 by 2.5 by 3 feet) occurred in Square B-7. It was suspected that the black soil may have been an area of human cremation, and a sample was tested at the Lackland Hospital Laboratory. No determination could be reached as to whether or not human materials were present (Dr. Mayble, personal communication).

The block of limestone in Square B-7 (which nearly terminated the project early by falling on the author) must have been used as a seat or back rest by a flint-knapper. Within a semicircle with a radius of six feet was a concentration of Pedernales projectile points. These points varied from perfectly chipped to crude, unfinished specimens. A heavy concentration of workshop debris also occurred in this semicircular area.

Three charcoal samples were obtained from the lowest occupational layer, but no carbon samples were obtained from the upper layers.

Twenty week-ends and 21 days of military leave were spent on the Crumley site, with a work force varying from one to 22, mostly members of the University of Texas Archeological Society. Photography for publication was done by Master Sergeant Paul Ambrico of Lackland Air Force Base.

Stratigraphy

Throughout most of the excavated undisturbed area of the site five strata could be observed (Fig. 3). Stratum 1, the lowest, was a layer of yellow-orange sand and clay ranging in thickness from 10 to 24 inches. It rested on limestone bedrock. In the northern section (0 to 5 feet south) clay was present in greater quantity than in the southern section, which was rather sandy. The original fires were built on top of Stratum 1, as evidenced by areas of clay baked brick-hard, from which the only adequate charcoal samples were obtained. Artifacts were only occasionally found in Stratum 1, and rarely more than four inches below its surface.

Stratum 2, the first midden accumulation, was rather sharply demarcated from Stratum 1. It was composed of burned limestone in

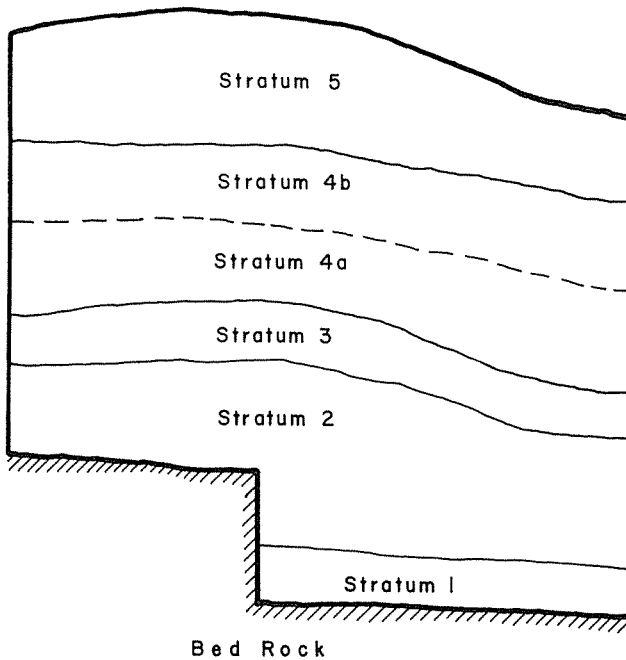


Fig. 3. Profile from Square D-11 (10 to 15 south and 35 east), showing stratigraphy at Crumley site.

angular slabs and fragments, prodigious quantities of burned snail shells, gray-black earth, workshop flint debris, and artifacts. In thickness it varied from 8 to 20 inches.

Overlying Stratum 2 was Stratum 3, an almost sterile layer varying from 5 to 18 inches in thickness. It contained a slightly lighter shade of soil, fewer burned rock fragments (also a shade lighter), very few snail shells, and almost no artifacts. Its demarcation from Stratum 2 below and Stratum 4 above was not always pronounced. However, it could be traced by careful examination.

Stratum 4 was similar to Stratum 2, containing grayish-black earth, large quantities of burned limestone, snail shells, flint debris, and artifacts. In thickness it ranged from 9 to 15 inches. Although physically homogeneous, it has been divided into two parts, 4a and 4b, because of differences in artifact content.

Stratum 5 was a layer of very black top soil, free of burned rocks, snail shells, and it yielded less than a dozen artifacts.

Analysis

Catalogue numbers were assigned to 1,300 artifacts serially as found. These were separated first by class (knives, dart points, scrapers, etc.) and then by style within the class (stemmed knives, circular knives, ovate knives, etc.). Artifacts were then separated by stratum (2, 4a, 4b, and 5). Artifacts whose stratigraphic position was not clear were separated, as were those collected from the surface or from back dirt. Dart points were typed by reference to the *Handbook* (Suhm, Krieger, and Jelks, 1955) and were also compared with the type specimens on file at The University of Texas. Valuable assistance in typology was rendered by T. N. Campbell, E. Mott Davis, Edward B. Jelks, and Mrs. Mardith K. Schuetz.

As very little has been published on the typology of tools, a special effort was made to determine tool types and associate them with particular styles of dart points. The horizontal distribution of dart points was studied by plotting specimens on overlays of the excavation plan. Bulverde and Pedernales points were plotted separately on profiles to determine if any significance could be attached to presence or absence of barbs. The average depth of each type of dart point was computed (see Table 1) to determine if there was any possibility of determining relative chronology of different types of points by average depth irrespective of horizontal distribution.

Flint flakes (2951 or approximately half of the specimens collected) were merely identified as knife and dart fragments, spokeshaves, graters, cutting tools, and unworked flakes. No analysis was made of their provenience. Nor was any special analysis made of 162 specimens found in one day's screening of midden material scattered by the bulldozer.

A total of 4251 artifacts was examined, but this is by no means the total that this site has yielded or could yield. Toward the end of our excavation the Crumley site was badly cannibalized by misguided collectors.

Artifacts from the Crumley Site

Dart Points. Of the 557 projectile points complete enough for classification, not a single specimen can be identified as an arrow point. All are dart points, and they include 24 recognizable types (Fig. 4) linked with the Edwards Plateau Aspect. In addition there are three distinctive forms that are here designated as "Trolan," "Crumley," and

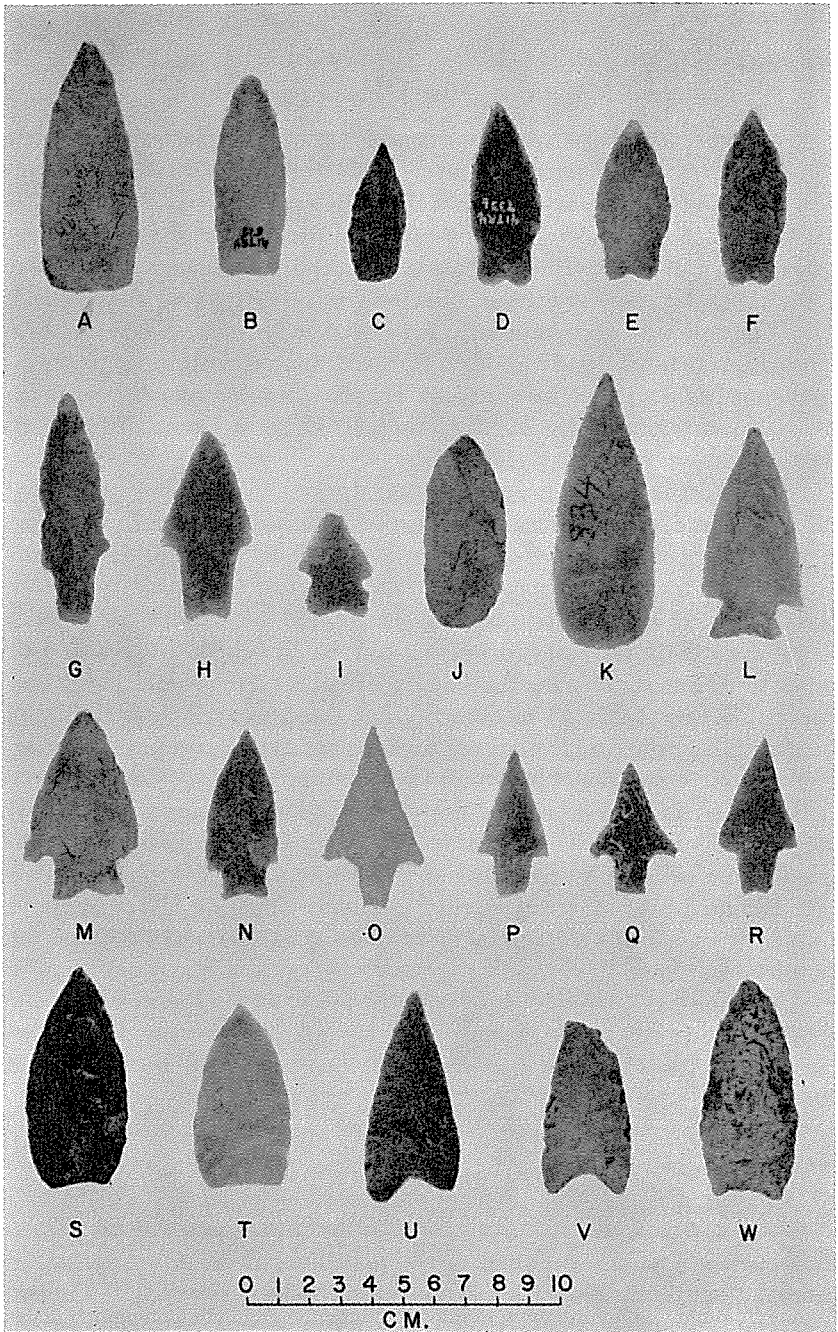


Fig. 4. Projectile points from Crumley site. A-C, Pandora type; D-F, "Crumley;" G-H, Wells; I, Frio; J-K, Refugio; L-N, Martindale; O-R, Langtry; S-W, Kinney.

TABLE 1

Provenience of Projectile Points From Crumley Site

| Type | Stratum 2 | | Stratum 4a | | Stratum 4b | | Stratum 5 | | Undeter- mined | Total | Average Depth |
|-------------------------------|-----------|-----|------------|------|------------|-----|-----------|----|-------------------|-------|------------------|
| | No. | % | No. | % | No. | % | No. | | | | |
| Abasolo | 1 | 100 | . | .. | . | .. | . | . | 1 | 2 | 32 |
| Angostura | 2 | 100 | . | .. | . | .. | . | . | . | 2 | 24* |
| Bulverde | 51 | 58 | 33 | 37.5 | 4 | 4.5 | . | . | 23 | 111 | .. |
| Castroville | . | .. | . | .. | 2 | 100 | . | . | 3 | 5 | 15.5 |
| "Crumley" | 3 | 100 | . | .. | . | .. | . | . | . | 3 | 35 |
| Darl | . | .. | 1 | 100 | . | .. | . | . | . | 1 | 19* |
| Ellis | 1 | 50 | . | .. | 1 | 50 | . | . | . | 2 | 21.7* |
| Frio | . | .. | . | .. | . | .. | 1 | . | . | 1 | 4 |
| Kinney | . | .. | 3 | 100 | . | .. | . | . | 2 | 5 | 18.3 |
| Lange | 4 | 15 | 22 | 81 | 1 | 4 | . | . | 8 | 35 | 21.1 |
| Langtry | 4 | 80 | 1 | 20 | . | .. | . | . | . | 5 | 23.8* |
| Marcos | . | .. | 4 | 50 | 4 | 50 | . | . | 1 | 9 | 18.5 |
| Marshall | 2 | 22 | 4 | 44 | 3 | 34 | . | . | 1 | 10 | 17.7 |
| Martindale | . | .. | . | .. | . | .. | 1 | 2 | . | 3 | 8 |
| Meserve | 2 | 100 | . | .. | . | .. | . | . | . | 2 | 27.5 |
| Montell | . | .. | 4 | 23 | 13 | 77 | . | . | 1 | 18 | 15.5 |
| Nolan | 41 | 93 | 3 | 7 | . | .. | . | . | 7 | 51 | 30.3 |
| Pandora | 2 | 67 | 1 | 33 | . | .. | . | . | . | 3 | 22* |
| Palmillas | 1 | 100 | . | .. | . | .. | . | . | . | 1 | 27 |
| Pedernales | 3 | 2 | 146 | 95 | 4 | 3 | . | . | 29 | 182 | 21.2 |
| Refugio | . | .. | . | .. | 2 | 100 | . | . | . | 2 | 12.5 |
| Tortugas | . | .. | 2 | 67 | 1 | 33 | . | . | 3 | 6 | 17 |
| Travis | 54 | 89 | 7 | 11 | . | .. | . | . | 8 | 69 | 29.5 |
| "Trolan" | 5 | 71 | 2 | 29 | . | .. | . | . | . | 7 | 27 |
| Williams | . | .. | 8 | 80 | 2 | 20 | . | . | 1 | 11 | 21.9 |
| Wells | 1 | 50 | 1 | 50 | . | .. | . | . | . | 2 | 23* |
| "Unid. Concave Base" | 6 | 75 | 2 | 25 | . | .. | . | . | 1 | 9 | 33.3 |
| Total | | | | | | | | | | | |
| Classified | 183 | 40 | 244 | 52 | 37 | 8 | 2 | 91 | 557 | | |
| Unclassified | . | .. | . | .. | . | .. | . | . | 53 | | |
| Total dart points represented | | | | | | | | | 610 | | |

* Average depth does not agree with profile data or association; sample too small.

"unidentified concave base." Paleo-Indian dart points are represented by two specimens of *Angostura* type and two of *Meserve* type.

The *Pandora* type is represented by three specimens (Fig. 4, A-C), two of which (A-B) are from Stratum 2 and the third (C) from Stratum 4a. They were found near Bulverde and Tortugas points.

Three points (Fig. 4, D-F), here designated "*Crumley*," are uniform in size and shape. Their bases bear shallow notches, their shoulders are poorly developed, and the lateral edges of their blades are serrated. All three were found in the transition zone between

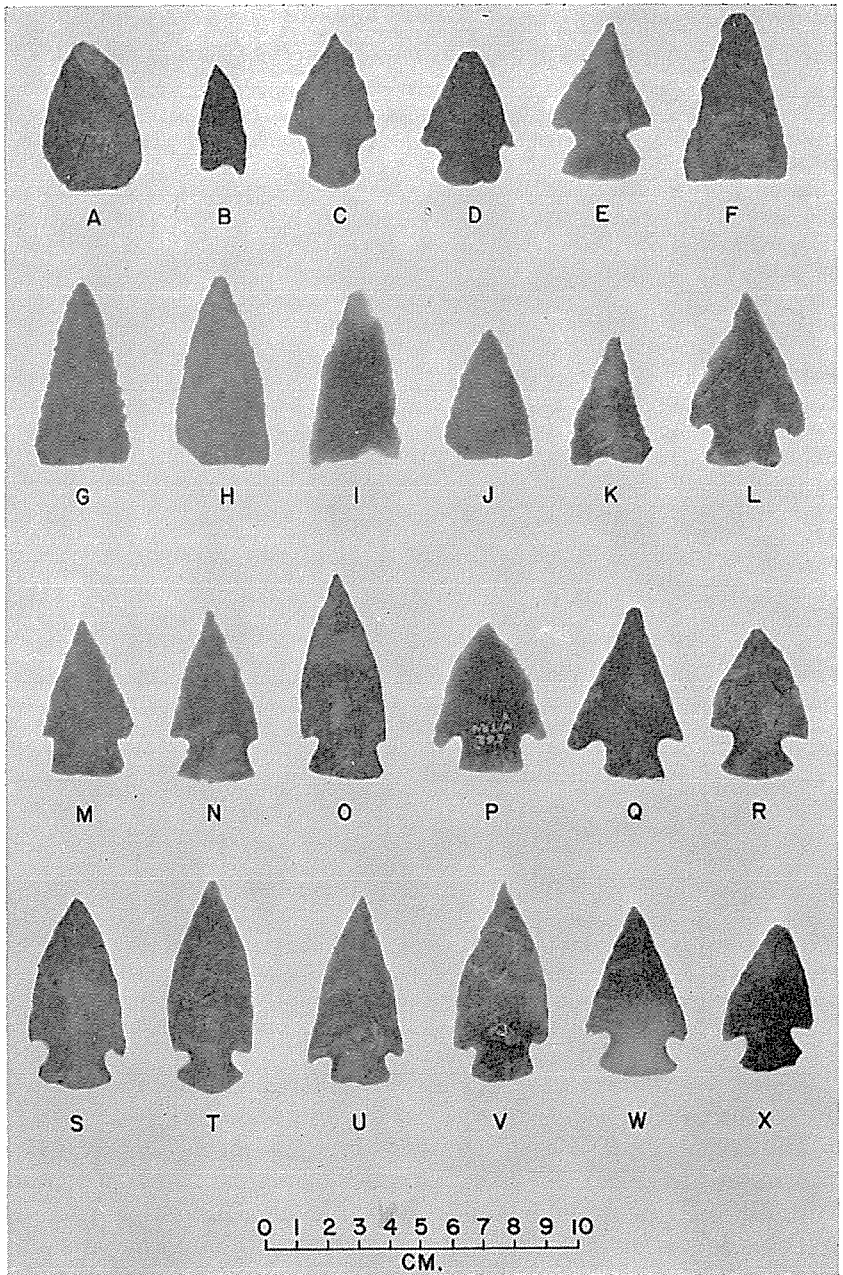


Fig 5. Projectile points from Crumley site. A, Abasolo type; B, Darl; C, Palmillas; D-E, Ellis; F-K, Tortugas; L-Q, Lange; R-X, Williams.

Stratum 1 and Stratum 2, where they were associated with Nolan points. They are among the earliest points represented at the Crumley site.

The *Wells* type is represented by only two specimens (Fig. 4, G-H), one (G) from Stratum 2, the other (H) from Stratum 4a. The specimen at H resembles the Langtry point, but it is much thicker and heavier than most Langtry points.

Only one *Frio* point was found at the Crumley site. This specimen (Fig. 4, I) was found at a depth of 4 inches below the surface in Stratum 5, which was practically sterile of artifacts. It would appear that the Frio point was very late in the Archaic occupation of this site.

Two *Refugio* points (Fig. 4, J-K) occurred in Stratum 4b, well above the nearest Pedernales points in Stratum 4. They were most closely associated with Montell points.

The *Martindale* type is represented by three specimens (Fig. 4, L-N). One was found in Stratum 5 at a depth of 8 inches, but the remaining specimens were not found *in situ*. Such evidence as there is indicates that both Martindale and Frio points are late at the Crumley site.

Five *Langtry* points (Fig. 4, O-R) were recovered, four in Stratum 2 and one in Stratum 4a. Their average depth (23.8 inches) is not significant because four of them were found near the thin edge of the midden. What is more significant is their horizontal clustering in one area of the midden, suggesting a short-lived, possibly one-time occupation. These Langtry points occurred in Squares A-8, B-9, D-9, E-8, and E-10. Their main associations were with Nolan and Travis points.

Kinney points, five in number (Fig. 4, S-W), were closely associated with Pedernales points in Stratum 4a. Only three of the five Kinney points were found *in situ*.

One *Abasolo* point (Fig. 5, A) was associated with Nolan points at a depth of 32 inches in Stratum 2. This specimen is alternately beveled on the left.

One *Darl* point (Fig. 5, B) was found at a depth of 19 inches in Stratum 4a, where it was associated with Pedernales points. It is made of glossy black flint and its blade is strongly beveled on the right side of each face.

A single *Palmillas* point (Fig. 5, C) was associated with Travis points at a depth of 27 inches in Stratum 2.

Two *Ellis* points (Fig. 5, D-E) were found, one (E) associated with Travis points at a depth of 33 inches in Stratum 2, the other (D) associated with the Montell point at a depth of 10 inches in Stratum 4b.

Of the six *Tortugas* points found (Fig. 5, F-K), only three have

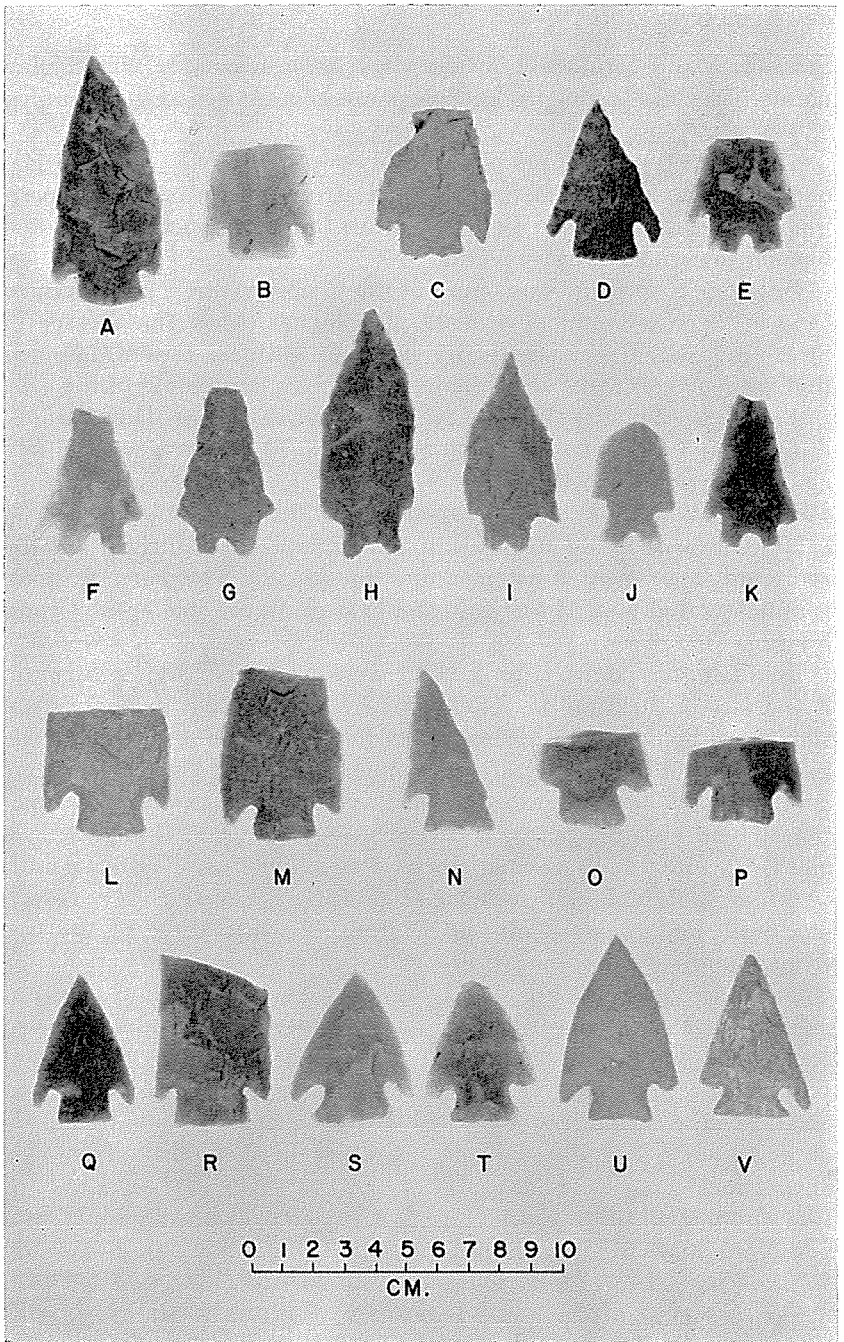


Fig. 6. Projectile points from Crumley site. A-D, Castroville type; E-K, Montell; L-Q, Marshall; R-V, Marcos.

reliable provenience data. Two were in Stratum 4a at a depth of 19 inches, and the third was in Stratum 4b at a depth of 17 inches. The specimen at F is alternately beveled on the left; the specimen at G is alternately beveled on the right. The remainder (H-K) are beveled on both sides of both faces. All are finely made except K, which is heavily patinated. It is thought to have come from Stratum 2, but the provenience is doubtful.

Lange points at the Crumley site are rather numerous, 27 specimens being recovered *in situ*. Of these, 81% were associated with Pedernales points in Stratum 4a. Six examples are shown in Fig. 5, L-Q.

The *Williams* point (Fig. 5, R-X), represented by 11 specimens, was also associated with Pedernales points in Stratum 4a, 80% of the specimens being so associated.

Castroville points (Fig. 6, A-D), five in number, but only two *in situ*, were associated with the Montell point in Stratum 4b. Castroville points occurred only in Squares B-7 and C-7.

Montell (Fig. 6, E-K) was the principal type of Stratum 4, where 17 specimens were located at an average depth of 15.5 inches. Four of these were associated with the uppermost Pedernales points in Stratum 4a, and 13 were associated with Castroville, Refugio, Marshall, Williams, and Marcos points in Stratum 4b. All specimens are either broken or unfinished. The horizontal distribution of the Montell points appears to be significant. Twelve points were spread along the northern boundary of the site, suggesting a late "up hill" occupation. The squares involved are A-5 (1 specimen), B-6 (1), B-7 (2), C-7 (1), B-8 (3), B-9 (1), C-10 (2), and C-11 (1). Six more occur in Squares D-9, D-11, E-9, E-10, and E-11, suggesting another occupation.

Of the 10 *Marshall* points (Fig. 6, L-Q), four were associated with Pedernales points in Stratum 4a and three with Montell points in Stratum 4b.

The *Marcos* type, represented by 8 *in situ* specimens (Fig. 6, R-V), appeared in Stratum 4a (4 specimens) and Stratum 4b (4).* The main associations are with Montell and Pedernales points.

A total of 182 *Pedernales* points (Fig. 7, A-K) was collected at the Crumley site, and it was the dominant type in Stratum IVa (146 *in situ* specimens). It was most closely associated with Kinney, Williams, and Lange points. While there was no natural stratigraphic separation between Stratum 4a and Stratum 4b, there is positive artifact stratigra-

* The horizontal distributions of Marcos, Marshall, and Castroville closely followed that of Montell—along the northern edge of the site. Six Marshall points were clustered with Montell in Squares D-9, D-10, D-11, E-10, and E-11.

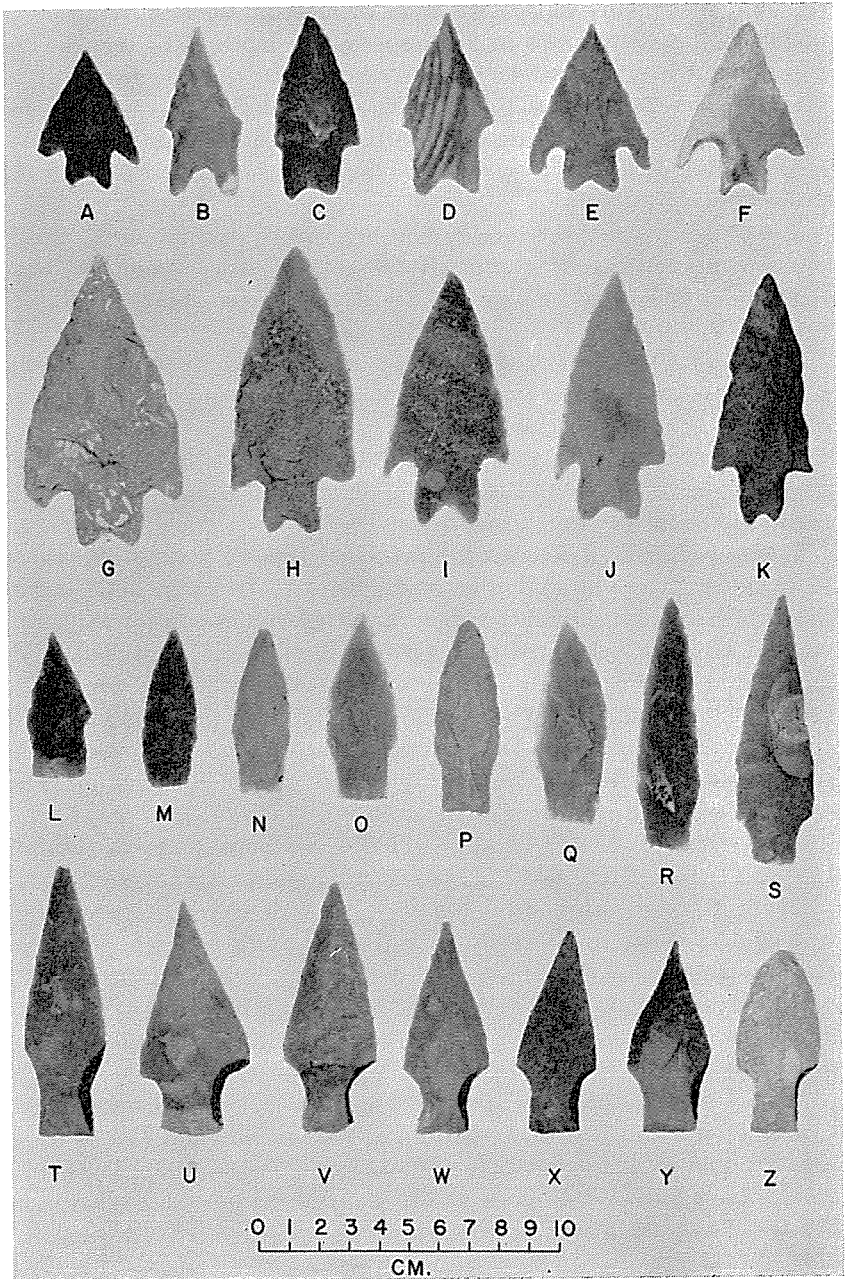


Fig. 7. Projectile points from Crumley site. A-K, Pedernales type; L-S, Travis; T-Z, Nolan.

phy, with Montell, Marshall, Marcos, and Castroville points associated with and also overlying Pedernales points. A check was made to determine if there was any chronological significance in the presence or absence of barbs in the Pedernales point. No significant vertical distributions were noted.

The *Travis* point (Fig. 7, L-S), represented by 69 specimens, was the most popular style in Stratum 2 (54 *in situ*). Several Travis points (as Fig. 7, M-N) are heavily patinated and resemble Angostura points, but they lack the parallel flaking and basal grinding of Angostura points. Specimens M and N and the Angostura point shown in Fig. 9, P, were found closely associated. At the Crumley site Travis points are closely associated with Nolan points.

The *Nolan* point (Fig. 7, T-Z), represented by 42 *in situ* specimens, was almost as popular as the Travis point in Stratum 2. All the Nolan points are alternately beveled on the stem, and one (Y) is also alternately beveled on the blade. Nearly all of these points have stems beveled on the right.

A total of 111 *Bulverde* points (Fig. 8, A-G) was found in the various artifact-bearing strata, where they were associated with all the major projectile point types. It was the longest-lived style in the midden. However, it was most popular in Stratum 2 (58%), decreased in Stratum 4a (to 37.5%), and was very rare in Stratum 4b (4.5%). Because of wide variation in the *Bulverde* points at the Crumley site, as well as in the type as defined by Suhm, Krieger, and Jelks (1954: 404), several analyses were made. First, all *Bulverde* points were carefully profiled in Stratum 2 and Stratum 4. A check was made to see if there was any stratigraphic segregation of the barbed (C, D, and E) and the shouldered varieties (A, B, F, and G). Both forms were found to be closely associated in all levels. A check was also made on variations in basal outline. It was found that concave-based *Bulverde* points, which resemble some variants of the Pedernales type, were about evenly distributed in Stratum 2 and Stratum 4. A final check was made on the stratigraphic position of the square-shouldered, straight-based *Bulverde* points, which resemble Travis points in all features except the shoulders. It was found that 22 out of 23 such specimens occurred in Stratum 2, where they were closely associated with the Travis points they resemble. This relationship should be checked at other stratified sites, for this may lead to modification of the *Bulverde* type.

"*Trolan*" is a term that has been coined for seven specimens (Fig. 8, H-M) whose characteristics indicate an intermediate position between types Travis and Nolan, hence the hybrid term "*Trolan*." These

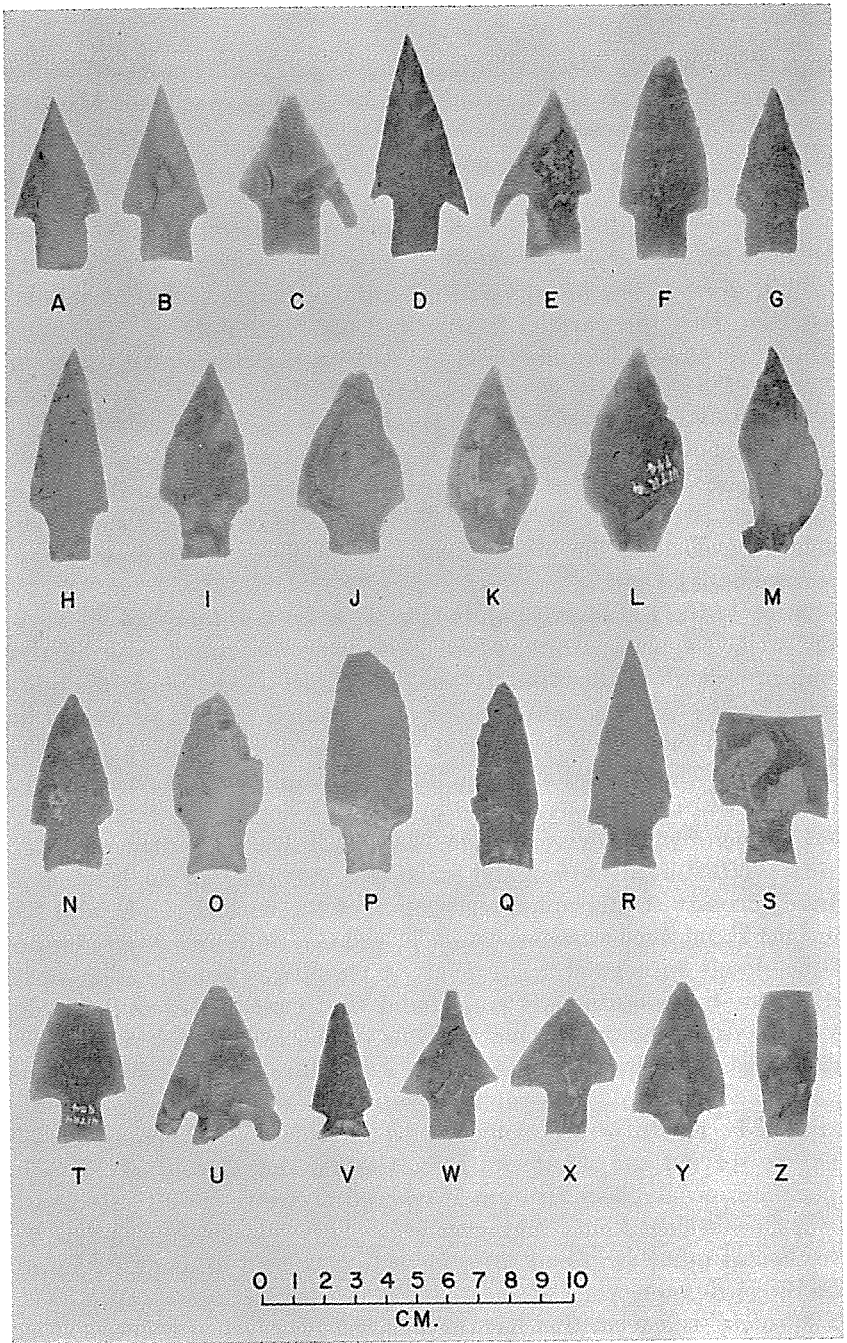


Fig. 8. Projectile points from Crumley site. A-G, Bulverde type; H-M, "Trolan;" N-T, "unidentified concave base;" U, Shumla (?); V-Z, unclassified.

have the stem and shoulder outlines of the Travis-Nolan range but lack alternately beveled stems. Five of these are from Stratum 2, where they were associated with both Travis and Nolan points, and two are from Stratum 4a.

Nine specimens are here designated by the term "unidentified concave base" (Fig. 8, N-T). These occur in Stratum 2 for the most part (6 specimens) and are quite deep in the midden. N and Q may be Bulverde variants.

The remaining 53 specimens cannot be classified (some are in too fragmentary a condition for classification). Fig. 8, U, may be a *Shumla* point. Fig. 8, V is very thin and finely chipped, but lacks provenience data. W through Z are all forms that occur in Stratum 2. Z, which lacks basal grinding, is probably a Travis variant.

As for Paleo-Indian points, the *Meserve* type is represented by two specimens (Fig. 9, N-O), both from Stratum 2, one at a depth of 21 inches and the other at a depth of 36 inches. In both specimens the blade is alternately beveled on the left, and specimen O is lightly ground at the base. Two *Angostura* points were also found (Fig. 9, P-Q). Specimen P was found at a depth of 25 inches in Square B-7 and was associated with two Travis points. Specimen Q occurred at a depth of 23 inches in Square F-8, but was not closely associated with any other artifacts. Both *Angostura* points are from Stratum 2 and bear a heavy white patina. Q has been rechipped at the distal end, as indicated by the absence of patina. This appears to support the theory of Suhm, Krieger, and Jelks (1954: 105) that Archaic peoples in central Texas sometimes picked up projectile points from Paleo-Indian sites and used them. A prolific *Angostura* site, the Levi Rockshelter, is located only 10 miles north of the Crumley site.

The point illustrated in Fig. 9, R, was found at a depth of 18 inches in Square E-8 (Stratum 2) near a Nolan point. It lacks basal grinding, and may be a local copy of *Angostura* or possibly a knife.

The large point in Fig. 9, S, resembles a Clovis point but lacks fluting. It occurred in Stratum 2 (Square D-10, depth 28 inches) closely associated with Travis and "Trolan" points. It also lacks basal grinding.

Drills. Sixteen artifacts have been classified as drills. Of these, 13 have lenticular cross sections and three have diamond-shaped cross sections. Experimentation indicated that specimens with lenticular cross sections at the distal end could not have been used very well as drills on anything as hard as wood or soft stone. As with a knife point, the sharp edges bind and snap off. Four drills (unlabeled surface finds from elsewhere) were expended in demonstrating this limitation. The

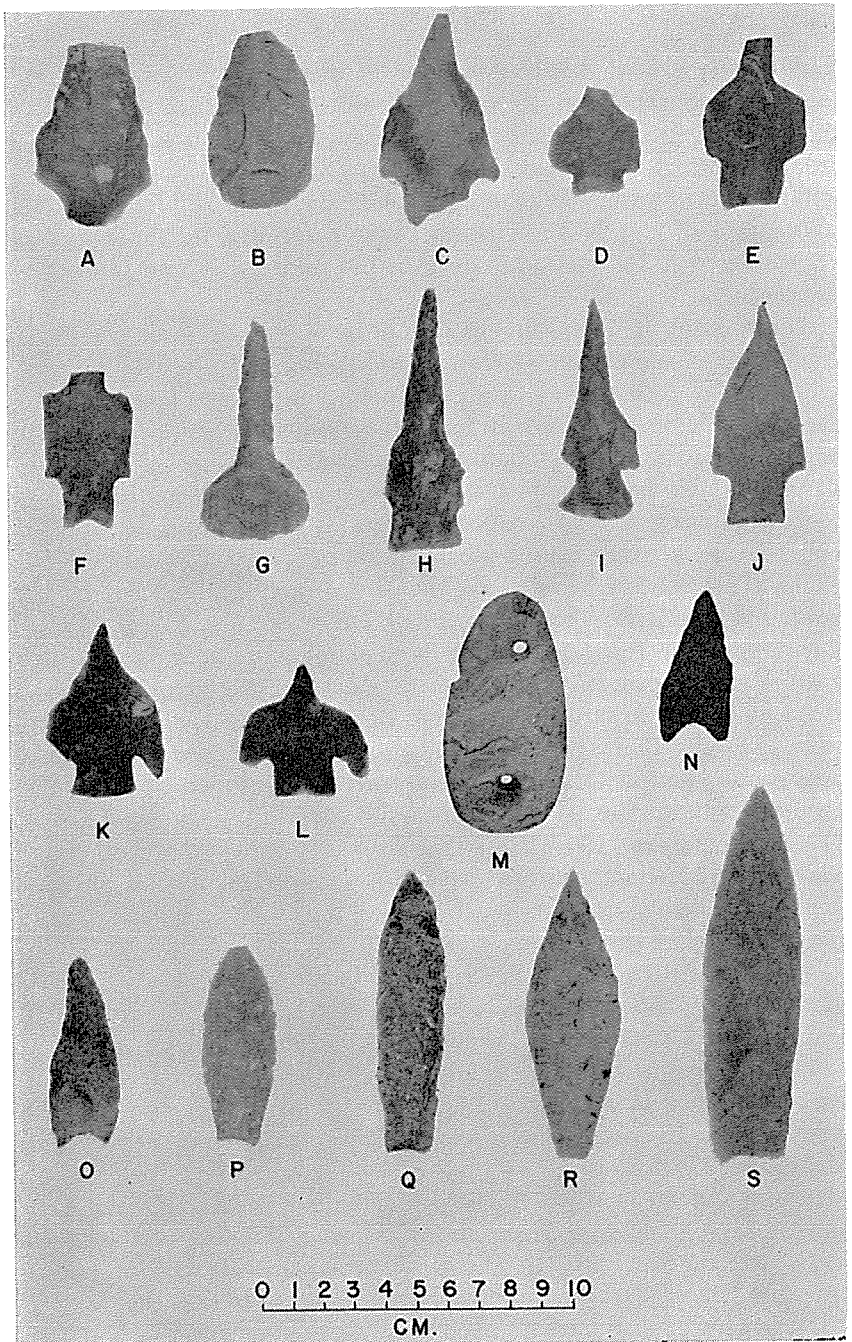


Fig. 9. Stone artifacts from Crumley site. A-L, drills; M, gorget; N-O, Meserve points; P-Q, Angostura points; R-S, unclassified dart points.

drills with diamond-shaped cross sections have twice as much bearing surface and remain centered in the work. Consideration should be given to identifying all chipped stone perforators as awls if they have thin, lenticular cross sections. Such specimens were probably used in sewing skins together.

In line with this argument, I would classify only three specimens from the Crumley site as drills, the specimens shown in Fig. 9 at E, F, and H. Specimens E and F are from Stratum 4a, and specimen H is from Stratum 4b.

Of the remaining specimens, Fig. 9, A and B, are from Stratum 2; C and D are closely associated with Pedernales points in Stratum 4a (both have Pedernales type stems); and G, I, K, and L are from Stratum 4b, associated with Marshall, Montell, and Castroville points. Specimen I has a Williams type stem, and K and L have Marshall type stems. G is the only key-shaped specimen found at the Crumley site.

Knives. These are defined as cutting tools that have been bifacially worked from cores or heavy flakes. They are generally larger than dart points. A few asymmetrical reshaped dart points are included because they appear to have been modified for cutting purposes.

The classification of knives and the study of their associations with specific projectile point types has been largely neglected in Texas archeology. The 210 specimens considered here have been arbitrarily classified, and significance is attached only to those represented by adequate samples and predominantly confined to one stratum.

Characteristic of Stratum 4 are stemmed knives (Fig. 10, A-F; Fig. 11, L), five being associated with 4a and three with 4b. Specimen B, which has a Williams type stem, is from Stratum 2 and is probably intrusive, as no Williams points were found in Stratum 2. An additional stemmed knife was not found in place. Specimen A, an asymmetrical knife with indented base, is closely associated with Pedernales points. Specimen D, with a Williams type stem, was associated with Montell points in Stratum 4b. Specimen E, with a slightly indented rudimentary stem, was associated with Bulverde points in Stratum 4b; and specimen F, an asymmetrically rechipped Bulverde point, was closely associated with Pedernales points in Stratum 4a. Fig. 11, L, is the largest stemmed knife (length 10.8 cm.) and is associated with Pedernales points. It could also be classified as a Marshall dart point.

Twelve thin *pear-shaped knives* (Fig. 10, G-L) were associated with Pedernales points in Stratum 4a. An additional specimen lacks provenience data. All have thinned bases and could have been hafted;

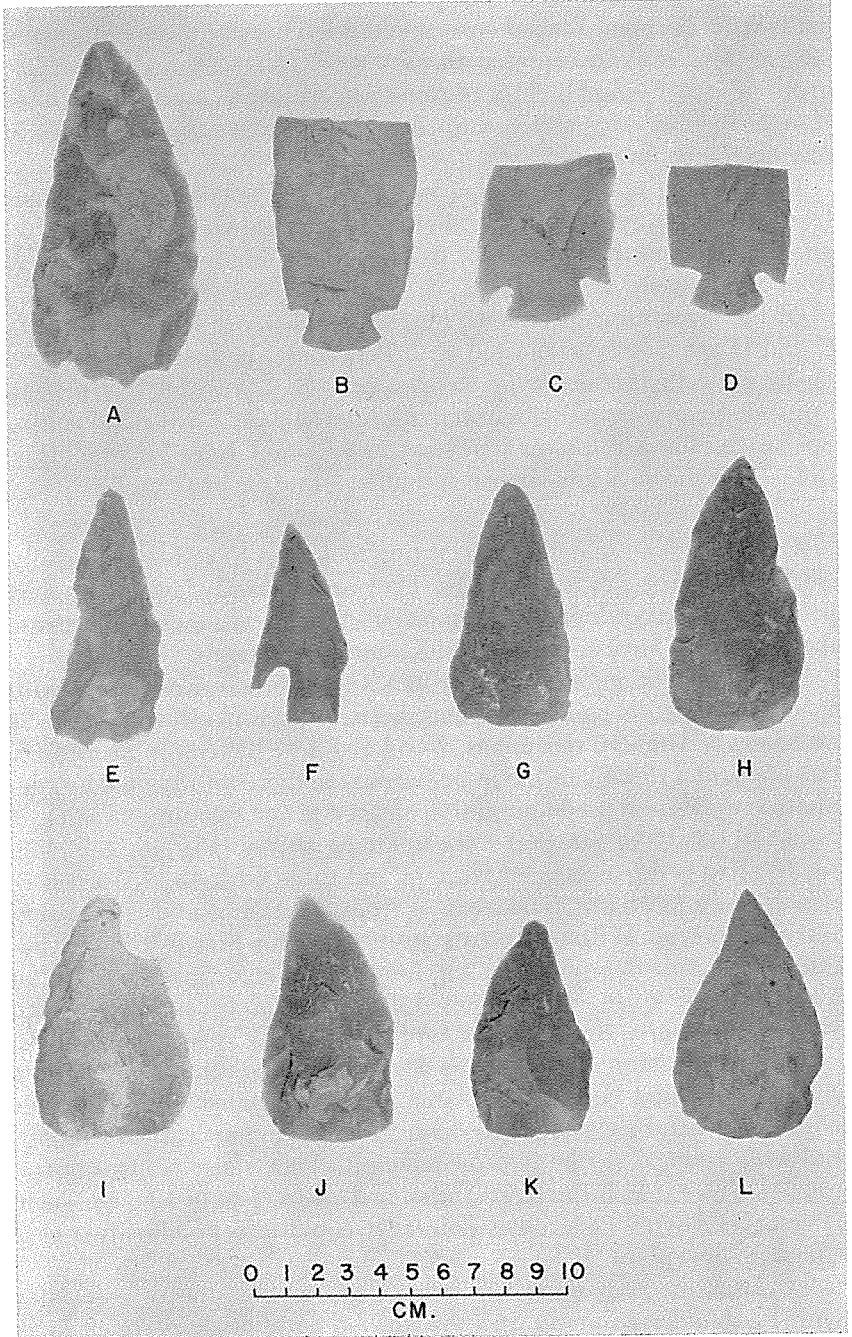


Fig. 10. Knives from Crumley site. A-F, stemmed knives; G-L, thin pear-shaped knives.

most of them are somewhat asymmetrical. In length they vary from 7 to 9.5 cm.

Twenty-five knives are here referred to as "odd shapes." Only one or a few of each kind were found. Included in this category are two *singled-shouldered knives* (Fig. 11, J-K) that were associated with points of Pedernales type in Stratum 4a (cf. Patterson, 1936; Plate 2, Fig. 6). A *back-tang knife*, different from forms described by Patterson (*op. cit.*), was associated with Pedernales points in Stratum 4a. This odd specimen (Fig. 12, A) is 8.3 cm. long and 5 cm. wide and all of its edges are sharpened without benefit of pressure flaking. Another oddity is a *knife shaped like a shoe last* (Fig. 12, G) that was associated with Travis and Nolan points in Stratum 2. It has a length of 13 cm., a width of 8 cm., and its edges were formed by pressure flaking. A single *convex-based triangular knife* (Fig. 11, A) was associated with Bulverde and Nolan points in Stratum 2. Another unique specimen was a *concave-based triangular knife* (Fig. 12, B), associated with Travis and Nolan points in Stratum 2. Of these various odd-shaped knives, 43% were found in Stratum 2, 57% in Stratum 4a; none was found in Stratum 4b.

Thin lanceolate knives (Fig. 11, B-C) are represented by eight specimens that are about evenly divided among the artifact-bearing strata (2 in Stratum 2; 2 in 4a; 1 in 4b; 1 with no provenience record.)

Asymmetrical knives (Fig. 11, D, I; Fig. 12, D) are characteristic of Stratum 2, where six specimens were associated with Travis and Nolan points. All are finely percussion flaked. Three more asymmetrical knives lack records.

Thin, pressure-flaked knives (Fig. 11, E-H) occur in Stratum 4a, where two specimens were associated with Pedernales points, and in Stratum 4b, where five specimens were closely associated with Montell points. The thinnest and most neatly flaked knife at the Crumley site is Fig. 11, E. It is not broken at the base as appears in the illustration. This base is a flat striking platform covered with calcium carbonate, which contrasts sharply with the glossy black flint. This material is rare at the Crumley site. The thin edges of this knife are translucent. It has a maximum thickness of 3 mm.

Large, thin, ovate knives (Fig. 12, C, E, F, H), all finely percussion flaked and ranging in length from 8.5 to 16 cm., occurred in Stratum 2. As all four specimens were found in Squares C-4, C-6, and C-7 at depths ranging from 25 to 33 inches, they probably represent a single occupational period.

Circular knives (Fig. 13, A-G, I) were closely associated with Peder-

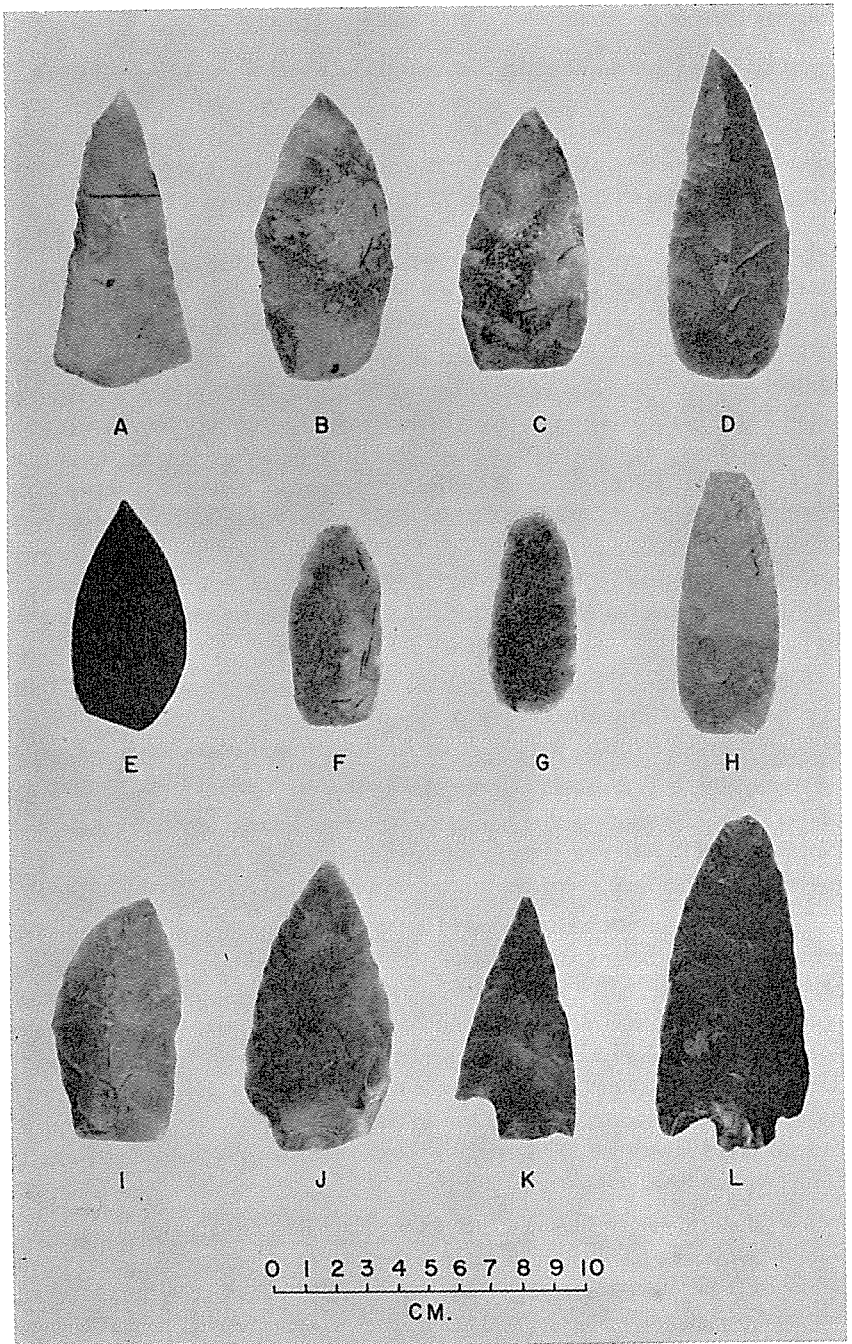


Fig. 11. Knives from Crumley site. A, odd form; B-C, thin lanceolate; D, I, asymmetrical; E-H, miscellaneous thin, pressure-flaked knives; J-K, single-shouldered; L, stemmed.

nales points in Stratum 4a (6 specimens). In maximum diameter they range from 5 to 8 cm. They are usually sharp all around except for a finger-sized space, which may be a fracture surface (F, G, I) or pecked smooth (A, B, E). Three additional specimens lack provenience records.

The remaining knives consist of fragments. Five basal fragments from Stratum 2 are similar to the large knives shown in Fig. 12, C-E. Nineteen fragments have convex bases like Fig. 11, D, but are not so well made. Of these, seven are from Stratum 2, nine from Stratum 4a, and two from Stratum 4b. Horizontally they are well scattered over the site. An additional 26 basal fragments show considerable variation, but most of them have bases nearly at right angles to straight lateral edges (11 in Stratum 2; 12 in 4a; 3 with no provenience records).

In a final special category are *heavy, thick, ovate knives* (Fig. 16, H-J), also frequently called *heavy bifaces*. Of 21 complete specimens, 17 were found *in situ*: four in Stratum 2, nine in Stratum 4a, and four in Stratum 4b. In length these ranged from 9.6 to 13 cm., in width from 4.5 to 6.3 cm., and in thickness from 1.5 to 2.5 cm. Generally the base and distal point are sharp, but the lateral edges are rather crudely chipped. Several show evidence of considerable wear at the base, suggesting that this was the business end. Others have flat bases and worn distal points (see I); these may have been used as wedges. Two (see J) are constricted at the mid-section and may have been hafted.

Clear Fork Gouges. Five of these (Fig. 13, H, J-K) were found at the Crumley site, one from Stratum 1 at a depth of 53 inches, three from Stratum 2 associated with Travis points, and one from Stratum 4a associated with Bulverde points. All have steeply beveled bits.

Gravers. Four gravers were recovered from Stratum 4a, two being modifications of knife fragments. The others (Fig. 16, A-B) are more carefully shaped, and one of them (B) is an end-scraper with a graver beak on one lateral edge. An additional 33 gravers were recovered from miscellaneous flint debris collected at the site.

Choppers. These artifacts, 51 in number, with 46 *in situ*, are heavy core tools with one edge sharpened and the opposed edge left unworked to fit the hand comfortably. Of these, 13 are *unifacial choppers* (Fig. 14, E), consisting of split pebbles with one convex edge chipped (6 specimens in Stratum 4a, 5 in Stratum 4b, 2 not *in situ*). *Bifacial choppers* (Fig. 14, C) are much more numerous, 33 specimens, seven in Stratum 2, 20 in Stratum 4a, three in Stratum 4b, and three not *in situ*. Five additional specimens that are better chipped and more

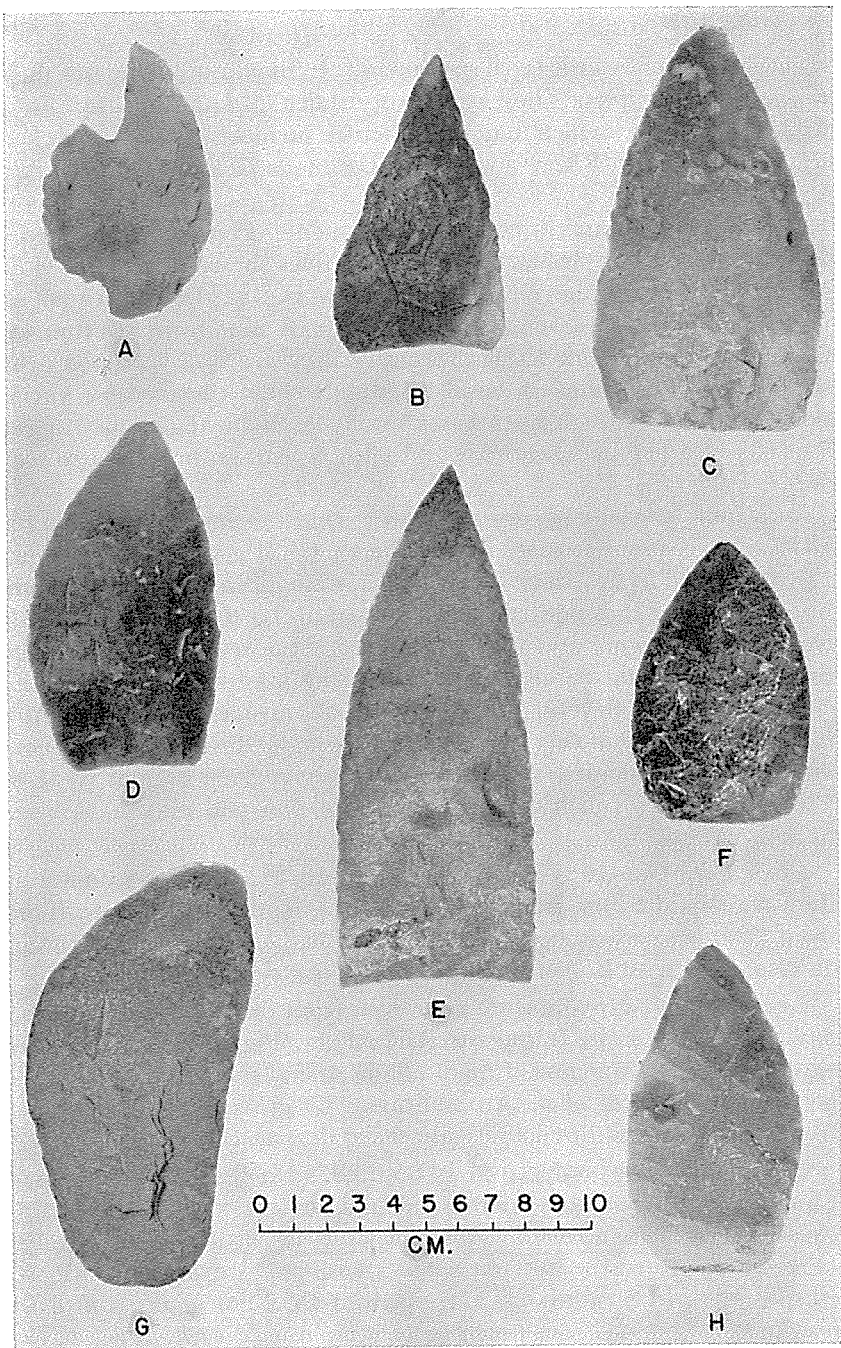


Fig. 12. Knives from Crumley site. A, stemmed; B, triangular; C-E, large, thin knives; F, H, ovate; G, shoe-last form.

uniform in shape are designated as *flint axes* (Fig. 14, D, F, G). Three of these are from Stratum 4a and two from Stratum 4b. They are associated with Pedernales, Montell, Castroville, and Marcos points.

Flake Tools and Flint Flakes. Flake tools with rechipped concave edges are designated as *spokeshaves* (Fig. 15, A-C, E, G-I, L, O-Q). *In situ* specimens total 67, but 92 additional spokeshaves were found in the miscellaneous flint debris collected from the site. Most of the *in situ* specimens (56) are chipped on only one face, the remainder (11) on both faces. They were widely distributed in all layers. In length these concave-edge scraping tools range from 5 to 13 cm. The retouched concavity varies from slightly concave to deeply concave, and a number of specimens bear two such concavities (Fig. 15, E).

Other scraping tools were not carefully studied, although they were sorted into five categories—uniface, biface, unifacial beveled, flake, and chisel. A total of 174 *scrapers* was catalogued, and reliable provenience data show the following distribution: 42 in Stratum 2, 55 in Stratum 4a (associated with Pedernales points), and 12 in Stratum 4b. It seems that when a scraper was needed, it was made on the spot from available material and probably to suit the particular piece of business at hand.

Thin, elongated flakes with one or both lateral edges retouched (sometimes apparently only from use) are designated as *flake knives*. Sorted from the miscellaneous flint debris were 624 such specimens. From the same source 1782 *flint flakes* were also sorted, apparently the residue of tool manufacture at this site.

Stone Gorget. A single polished stone gorget (Fig. 9, M) was found in the top soil at a depth of 5 inches. It was not associated with any dart points, the closest being a Martindale point several feet away and at a depth of 8 inches. This ornament is made of dolomite, possibly from the Boquillas formation of western Texas, but it could also be local limestone that has been burned (John A. Wilson, personal communication). Some of our bonfire experiments in cooking on limestone and extracting flint from limestone produced colors similar to those in the gorget (yellow, pink, and cream bands). This specimen has a length of 7.8 cm., a maximum width of 3.8 cm., and an average thickness of 1 cm. The two holes are biconically drilled, each cone having an outer diameter of about 8 mm. and an inner diameter of about 3 mm.

Hand Stones. Seven one-hand manos were recovered, but only one of these was found *in situ* (Fig. 14, B). This specimen is made of very abrasive pumice and was found in Stratum 2. The hand stone shown

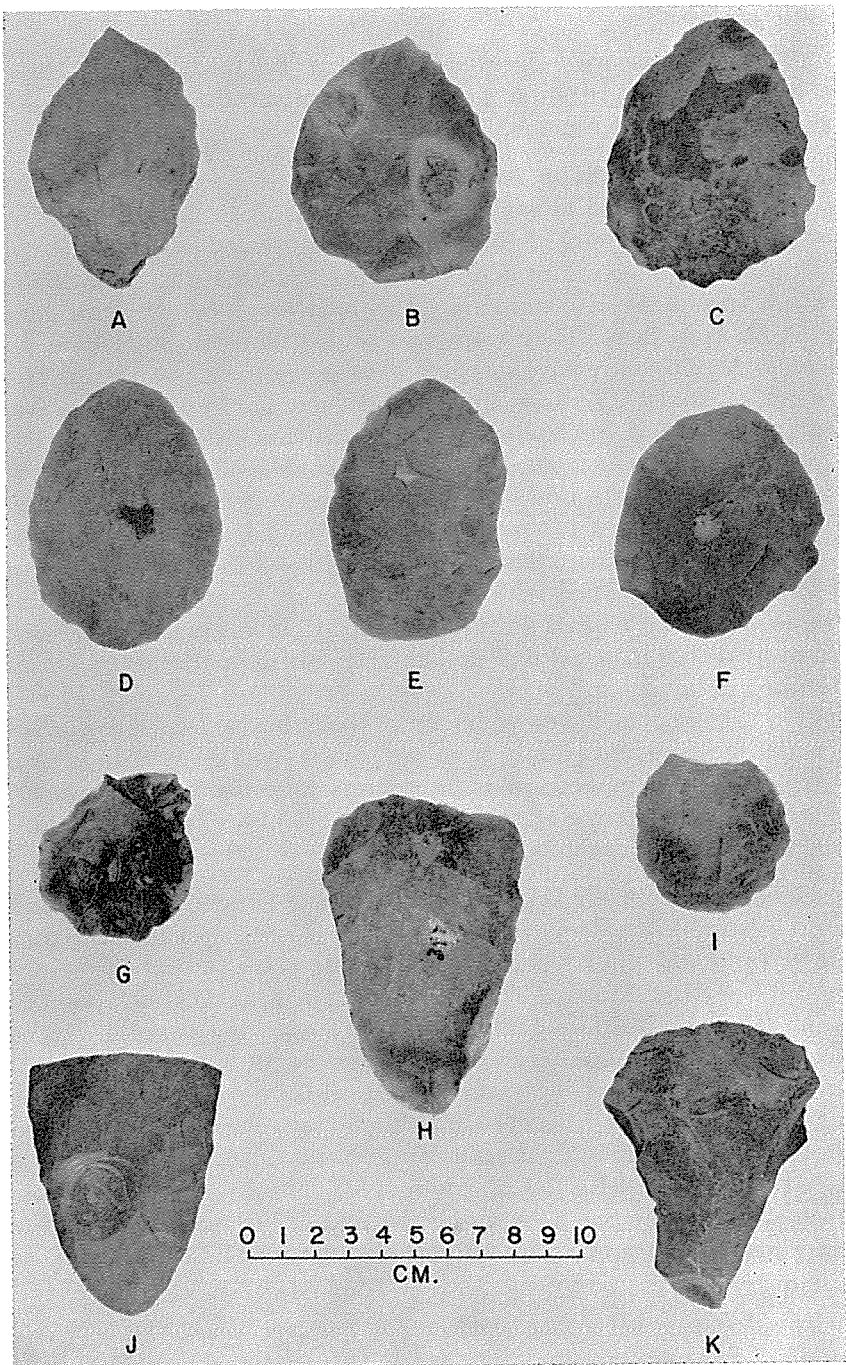


Fig. 13. Knives and gouges from Crumley site. A-G, I, circular knives; H, J-K, Clear Fork gouges.

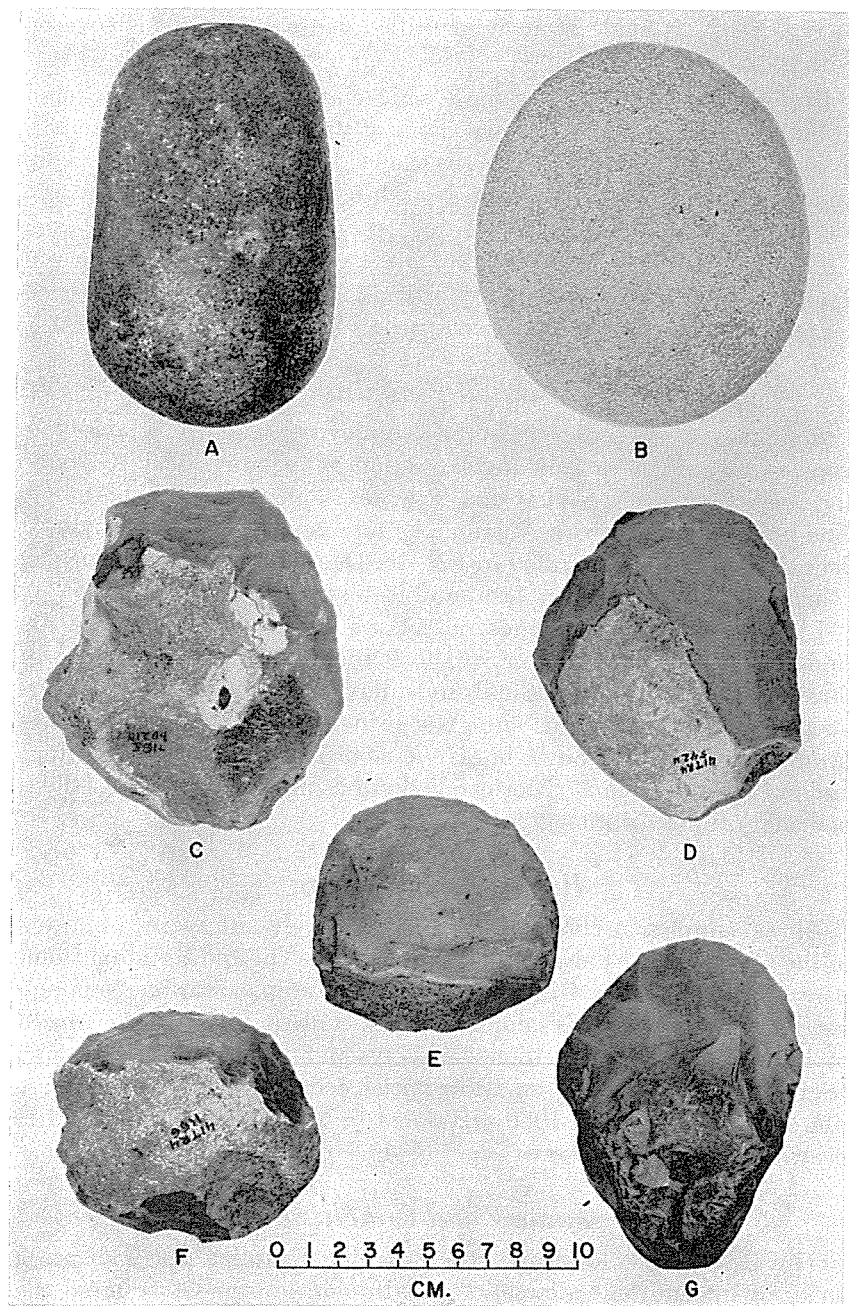


Fig. 14. Grinding and chopping tools from Crumley site. A-B, hand stones; C, biface chopper; D, F-G, hand axes; E, uniface chopper.

in Fig. 14, A, is made of an unidentified dense stone and is covered with red ochre.

Clay Lumps. Five lumps of dense white clay or kaolin were scattered in both Stratum 2 and Stratum 4. Four of these are roughly spherical in form, but the fifth (Fig. 16, C) is shaped like a modern cake of soap and shows evidence of abrasion. No white clay was observed in the vicinity of the Crumley site.

Bone Artifacts. Twelve sections of antler were recovered, and several appear to have served as handles for tools (Fig. 16, F-G). One eroded piece of bone appears to have been used as a flaking tool (Fig. 16, E).

Faunal Remains

Bone was poorly preserved at the Crumley site, and every long-bone appears to have been split for extraction of marrow. The 105 bone specimens have been filed at the Vertebrate Paleontology Laboratory, The University of Texas, Austin. The mammals represented include deer, bison (tooth illustrated in Fig. 16, D), and wolf, coyote, or dog (Curtis D. Tunnell, personal communication).

Literally hundreds of thousands of snail shells were found in the midden, frequently in layers up to 9 inches thick, particularly in Stratum 2 and Stratum 4. Snails must have been used for food by the peoples who occupied this site. The principal species represented is *Bulimulus dealbatus* (Say), but *Helicina orbiculata tropica* (Pfeiffer) and *Polygyra texasiana* (Moricand) occur as minor types (Don Allen, personal communication).

Radiocarbon Dating

Three samples of charcoal from the Crumley site were submitted to the Geochemical Laboratory of the Humble Oil and Refining Company, Houston, Texas. Only one of the three samples was large enough for dating purposes. This sample, O-1315, consists of charcoal enclosed by baked clay in the transition zone between Stratum 1 and Stratum 2 (Square B-4) and represents the initial occupation at the Crumley site. It was collected in 1960 and dated in May, 1961, at 3275 ± 125 years ago or 1315 ± 125 B.C.

Summary and Conclusions

The stratigraphy and artifacts from the Crumley site indicate a series of intermittent occupations by human groups who shared the same basic culture. This culture is commonly referred to as the Edwards Plateau Aspect of the Archaic Stage in Texas. Significant facts

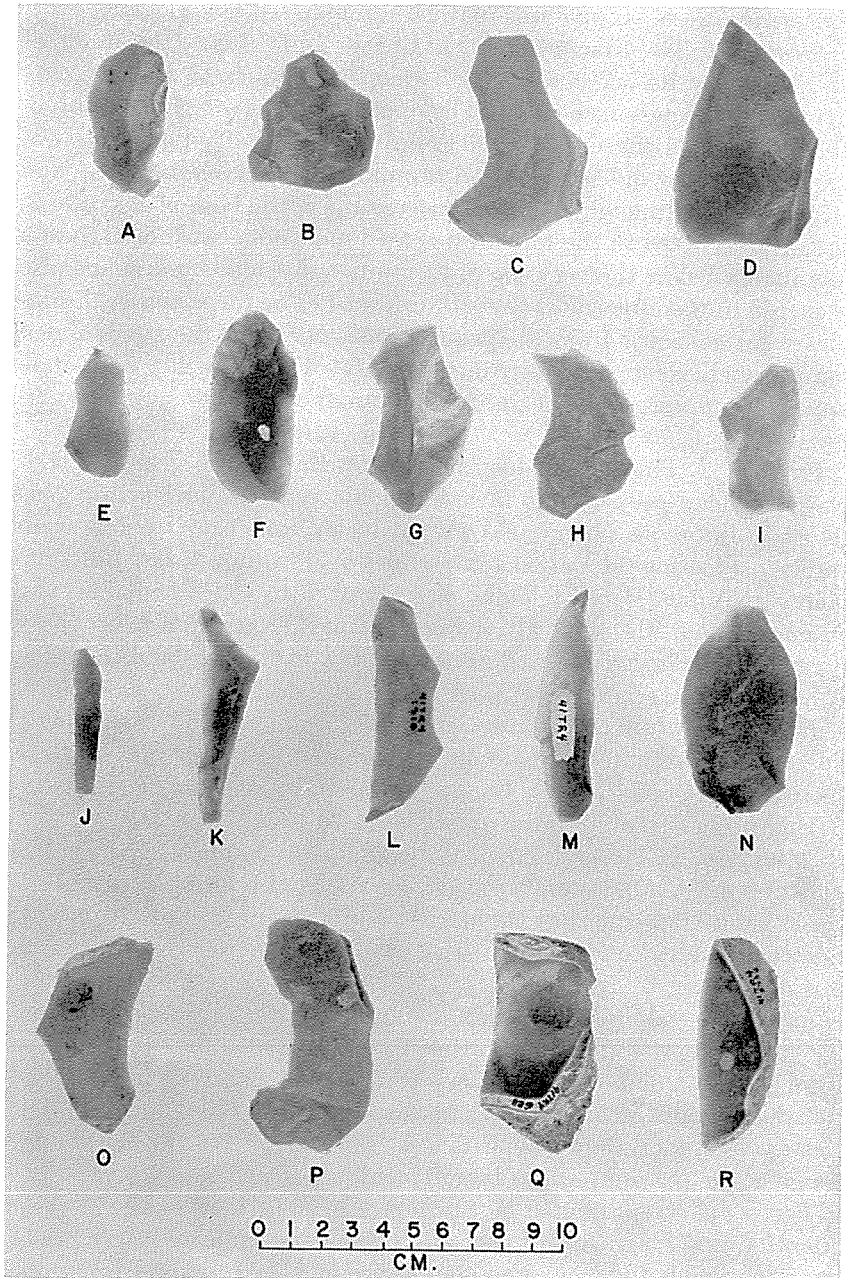


Fig. 15. Flake tools from Crumley site. A-C, E, G-I, L, O-Q, spokeshaves; D, F, J-K, M-N, R, flake knives.

concerning these occupations may be summarized as follows.

Stratum 1. The first occupants of the site built their fires on top of an almost sterile accumulation of orange-yellow sand and red clay that rests on limestone bedrock. The uppermost part of Stratum 1 probably represents the end of a dry, erosional period when sand was moved by both wind and water. A few dart points (Nolan, Travis, and "Crumley"), although charted as occurring in the base of Stratum 2, actually occurred in the top of Stratum 1; but none was more than a few inches below the very top of Stratum 1. A Clear Fork gouge also occurred in the uppermost part of Stratum 1. The three charcoal samples were collected from this transitional zone, and the single dated sample yielded an age determination of 1315 ± 125 B.C. This date appears to represent the beginning of human occupation at the Crumley site.

Stratum 2. This is a midden deposit attributable to groups of Edwards Plateau peoples who favored certain types of dart points, particularly Bulverde, Nolan, and Travis. Nolan and Travis points were rarely used after the period represented by Stratum 2, but Bulverde points continued to be popular afterward. Two Paleo-Indian types, Angostura and Meserve, which were confined to Stratum 2, probably represent survivals from earlier occupations in the surrounding area. A few other dart point types were in use only during the period represented by Stratum 2, notably Abasolo, Palmillas, and "Crumley." Sparingly represented, but also used in later occupational phases, were such types as Ellis, Lange, Langtry, Marshall, Pandora, Pedernales, "Trolan," Wells, and "unidentified concave base."

A study of Nolan and Travis horizontal distributions in Stratum 2 indicates at least three temporary occupations of the site. Among Bulverde points (second most popular type in Stratum 2), a variety with square shoulders and straight base was almost entirely confined to this stratum.

Asymmetrical and large, thin ovate knives were used only during the period represented by Stratum 2, but various other knife forms were present and most of these, especially those occurring in quantity, continued in use during later occupational phases. This is true of other classes of artifacts, but it appears to be significant that the Clear Fork gouge at the Crumley site is largely confined to Stratum 2.

The peoples represented by Stratum 2 evidently ate snails in great quantity, and fragments of deer and bison bone indicate heavy use of these mammals for food. The abundance of heat-fractured limestone indicates extensive use of limestone slabs around fires, presumably for cooking purposes.

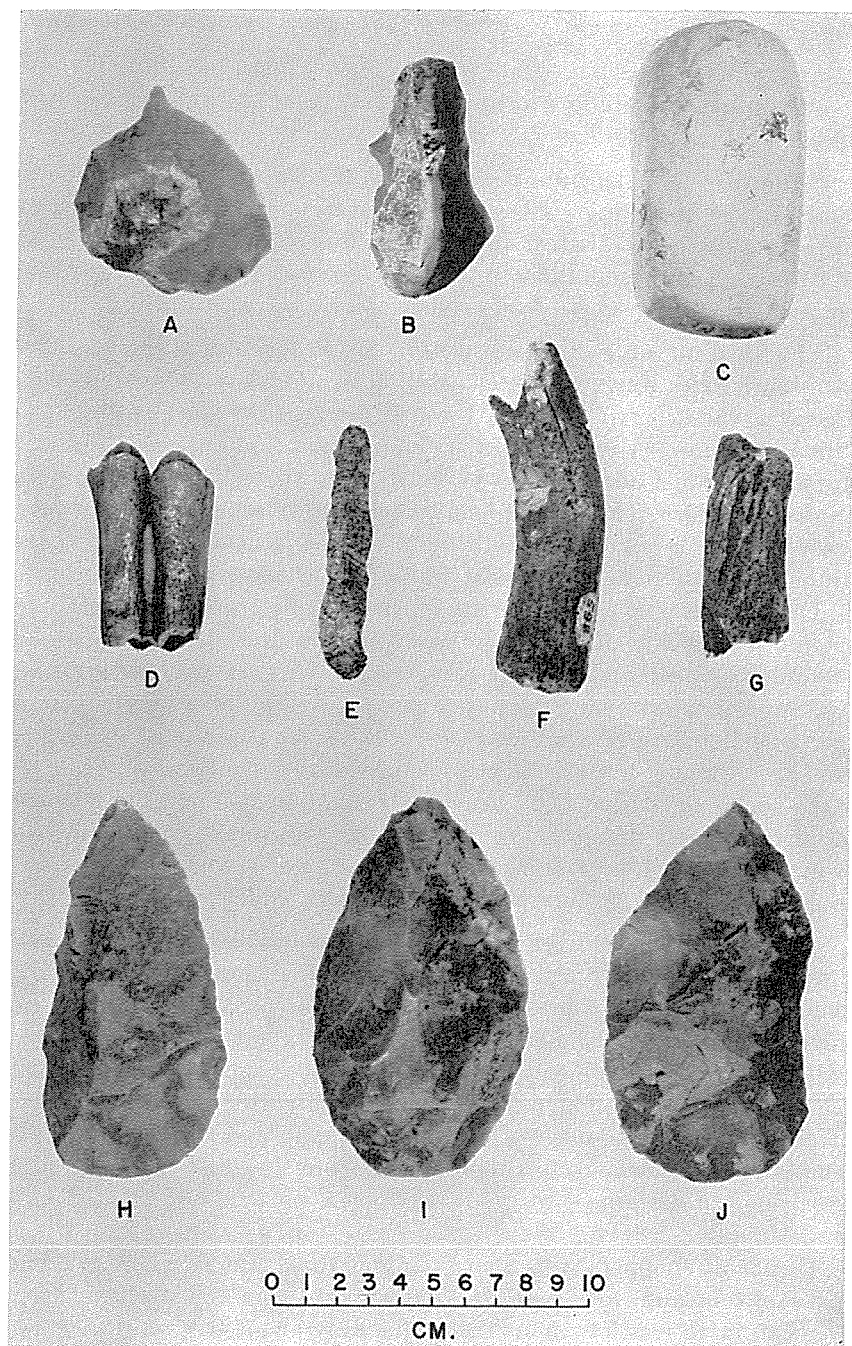


Fig. 16. Flint, bone, and antler objects from Crumley site. A-B, graters; C, white clay lump; D, bison tooth; E, bone flaking tool; F-G, antler handles; H-K, thick ovate knives or heavy bifaces.

Stratum 3. The Crumley site was abandoned for a considerable time, for the alluvial materials forming this layer are essentially sterile of artifacts.

Stratum 4. This stratum indicates that the site was again occupied, and by groups having virtually the same type of economy. Analysis revealed changes in artifact styles during this phase of occupation. For convenience in presentation, Stratum 4 was arbitrarily subdivided into 4a and 4b. No physical break could be observed in Stratum 4.

(1) Stratum 4a. In this substratum the Pedernales point was predominant, with Bulverde, Lange, Williams, and Marcos next most frequent in the order named. Darl and Kinney points were confined to this substratum. A number of dart point types that appeared in Stratum 2 continued into Stratum 4a but not into 4b, these being Langtry, Nolan, Pandora, Travis, "Trolan," Wells, and "unidentified concave base." A few types appeared for the first time in Stratum 4a and continued into 4b, namely, Marcos, Montell, Tortugas, and Williams.

During this phase drills were made principally from dart points, the points used being of types also used at this time. Circular, single-shouldered, pear-shaped, and back-tang knives, as well as gravers, were in use only during the period represented by Stratum 4a. Choppers, particularly bifacial choppers, were most popular at this time, and finely made fist axes appeared for the first time.

In terms of artifacts the heaviest occupation of the Crumley site occurred during the period represented by Stratum 4a. This could be a matter of more individuals living at the site or of various groups remaining longer each time the site was used.

(2) Stratum 4b. During the period represented by this substratum there were changes in artifact styles and frequencies. Montell was the dominant projectile point type. Bulverde, Marcos, and Pedernales tie for second place in frequency, and Marshall is in third place. Castroville and Refugio points were in use only during this occupational phase. Other points that were infrequently used include Ellis, Lange, Tortugas, and Williams. It is of interest to note that Refugio and Ellis points occurred only in the uppermost part of Stratum 4b. Horizontal clustering of certain point types was noted, particularly of Marshall and Montell.

Unifacial choppers were more popular than bifacial choppers, but fist axes continued to be used.

Stratum 4b was low in artifact yield, only about 10% of the Crumley series occurring here. The site was used less frequently or else was occupied for a shorter span of time.

Stratum 5. After the occupations of Stratum 4 the Crumley site was abandoned. Some 9 to 12 inches of dark soil accumulated, and this contained no fire-fractured rock or flint debris, and very few snail shells. Casual visitors to the site probably left the few artifacts recovered—a Frio point, a Martindale point, and a stone gorget.

As no identifiable Central Texas Aspect artifacts were found at the Crumley site, it was probably abandoned well before A.D. 1200, the latest date that anyone has assigned to the inception of the Central Texas Aspect. The absence of certain dart point types, such as Ensor and Edgewood, believed to be late in the Edwards Plateau Aspect, suggests abandonment of the site before the close of Edwards Plateau Aspect occupation in this area. Thus the Crumley site may be referred to a time period between about 1300 B.C. and sometime in the early part of the Christian Era.

Speculations

The physical size of the midden suggests that the Crumley site was occupied by a few families at the most. Campers today would probably not burn more than three fires at one time in this area, and it is hard to conceive of Archaic peoples, with all outdoors to live in, crowding even that much. Why then so many tons of burned rock? And why so many flint artifacts in such a small area?

No flint is now readily available in this immediate area. What was the source of the thousand pounds or so of flint found at this site? My theory is that flint was extracted in lenses and nodules from limestone slabs and boulders from the hillside by heating in fires and possibly quenching in water. Several campfire experiments indicated the feasibility of this method. Experiments also indicated that cooking meat on heated limestone slabs is practical and efficient.

One final question cannot be answered satisfactorily, namely, why was the Crumley site not occupied by the later Central Texas Aspect peoples? Possibly it was occupied and the remains lie buried nearby, but there are no surface indications.

Acknowledgments

The excavation of the Crumley site and the preparation of this report were made possible by assistance from a large number of individuals. I would like to express appreciation to each of the following: to Mr. Ewell Crumley, for permission to excavate the site; to Master Sergeant Gordon L. Mack, for aid in both excavation and laboratory work; to Master Sergeant Paul J. Ambrico for professional photogra-

phy; to my wife, Genie, for her tolerance during the period when our house was cluttered with archeological specimens; to staff members of the Department of Anthropology, The University of Texas, namely, T. N. Campbell, E. Mott Davis, Dale Givens, Edward B. Jelks, and Curtiss Tunnell, for advice and assistance; to members of the University of Texas Archeological Society and others from Austin whose labor in the field is deeply appreciated—Jake Bergolofsky, Mr. and Mrs. Bill Belk, Claud Bramblett, Marilyn Clark, Rosemary Clark, Tom Cook, Douglas Dashiell, Jim Davig, Gary Crow, Jules Gipson, Martha Gould, Johnny Greer, Molly Hays, Frances Hemphill, Phil Kendall, Glen Lockhart, Jackie McKinney, Buddy Miller, Parker Nunley, Leslie Pennington, Jane Phelps, Ed Power, Bernie Richert, Dan Scurlock, Reggie Sheffield, Sharon Stanfield, Billy Taylor, Alice Valentine, Frank Weir, and Jane Williams; and the following individuals from San Antonio also rendered valuable assistance: Merrilea and Tommy Kelly, Jimmy McCabe, and Mrs. Mardith K. Schuetz.

U. S. Air Force

References Cited

- Kelley, J. Charles, and T. N. Campbell
 1942. What are the Burnt Rock Mounds of Texas? *American Antiquity*, Vol. 7, No. 3, pp. 319–322.
- Patterson, J. T.
 1936. The Corner-tang Artifacts of Texas. *The University of Texas Bulletin*, No. 3618.
- Suhm, Dee Ann
 1960. A Review of Central Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 29 (for 1958), pp. 63–107.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
 1954. An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 25.

Archeological Notes on the Route of Cabeza de Vaca¹

HERBERT C. TAYLOR, JR.

The physical hardships which Alvar Nunez Cabeza de Vaca and his three companions suffered in their wanderings are, perhaps, only equalled by the mental travail of those who would trace their route.

There are at the moment at least a dozen proposed routes (whole or partial) which any serious student of the subject must consider.² In addition at least that many more articles, books, and theses contain extended commentary on Cabeza de Vaca's route.³ There are, additionally, the various editors of Cabeza de Vaca's *Naufragios* and Oviedo's *Report*, plus scores of popular writers in five languages whose contributions are marked by a boldness and enthusiasm as great as their scholarly and geographic innocence, whom the author forbears to cite.

The present paper does not represent an attempt to add another proposed route to an already overburdened list. Rather, this paper is an attempt to assess the archeological evidence, accumulated mainly in the last quarter-century, relevant to the problem of the route of Cabeza de Vaca. As it happens, no professional archeologist has published a study of the route of Cabeza de Vaca. The routes proposed by Krieger in 1955 and by Taylor in 1951 both appeared in unpublished doctoral dissertations.

All published studies of the route appeared before any extensive archeological field work had been done in Texas, except for Hallen-

¹ Much of this article is based upon unpublished work of Drs. A. D. Krieger, J. Charles Kelley, and the writer. In addition to Krieger and Kelley, the writer is indebted to Drs. T. N. Campbell and Jeremiah F. Epstein for aid and advice.

² Shea in Smith, 1871; Prince, 1883; Ponton and M'Farland, 1898; F. and Ad. Bandelier, 1904; H. H. Bancroft, 1886; O. W. Williams, 1899; B. Coopwood, 1899, 1900; J. N. Basket, 1907; Davenport and Wells, 1918, 1919; R. T. Hill, 1933, 1934; Sauer, 1932, 1937; Hallenbeck, 1940; Taylor, 1951; and Krieger, 1955.

³ De Leon (1649) quoted in Alessio, 1939; de Pichardo (1812) in Hackett, 1931; Smith, 1851; Davis, 1888; Haines, 1891; Raines, 1896; Bandelier, 1900; Read, 1912; Bolton, 1916, 1921, 1923, 1949; Belloguin, n.d.; Hodge, 1907; Twitchell, 1914; A. Williams, 1939; Bishop, 1933; Dobie, 1942; Taylor, 1949.

beck's book, published in 1940. The writer, therefore, proposes to divide this paper into two sections: (1) an analysis of the proposed routes in the light of archeological evidence, and (2) a brief presentation of unsolved archeological problems whose solution is necessary to a proper analysis of the *Naufragios*.

It is assumed that the reader is familiar with the scholarly controversy concerning the route of Cabeza de Vaca. No attempt is made to summarize the proposed routes⁴ and, except where immediately pertinent, the *Naufragios* and Oviedo are not cited.⁵ The sole purpose of this article is to discuss hitherto unpublished archeological data concerning the route.

The Proposed Routes in the Light of the Archeological Evidence

If one consults a map upon which all, or several, of the proposed routes are superimposed,⁶ the first impression is almost certain to be bewilderment. Starting on the Louisiana or Texas coasts, the lines of march curve northwest into northern New Mexico, before starting south, or plunge directly southwest, or dip or curve across Texas, Tamaulipas, Nuevo Leon, Coahuila, New Mexico, Chihuahua, and Sonora.

After the initial confusion has passed, however, a more leisurely examination of the charted routes, along with the accompanying texts of the various authorities, will reveal that the proposed routes may be grouped into four categories:

(1) The New Mexican school, largely nineteenth century writers, who seemed determined to get Cabeza de Vaca and his companions across Texas to the Pueblos as expeditiously as possible.

(2) Judge Coopwood, in a category all his own, who was possessed of the fixed idea that the wanderers did not end up at Culiacan in Sonora, where Cabeza de Vaca said they ended their wanderings and where the Spanish slave hunters under Guzmán said they encountered

⁴ The best summaries of the proposed routes are to be found in Williams (1939) and Krieger (1955).

⁵ The writer is employing the Buckingham Smith translation (edition of 1871) of the *Naufragios* as it appears in *Spanish Explorers in the Southern United States, 1528-1543*. Where deemed advisable this has been checked against the Spanish original as it appears in the 1932 (Madrid) edition and compared with the Bandelier (1904) translation.

⁶ The most readily accessible such map is contained in Hallenbeck, 1940, p. 307. Williams, 1939, also charts most of the routes individually.

them. Instead Coopwood has Cabeza de Vaca and his companions plunge steadily south-southwest, passing inland of the present Ciudad Victoria in Tamaulipas until they were south and well inland from what is now Tampico, whereupon they turn and trend west-northwest, passing through present Guadalajara and approach the Pacific coast in the region of Compostela.

(3) The all-Texas route, in which the castaways are kept north of the Rio Grande, within the confines of the present state of Texas until New Mexico is reached. Ponton and M'Farland, Hill,⁷ and Hallenbeck are the leading exponents of this view.

(4) The so-called "Mexican Detour,"⁸ which involves tracing the wanderers south-southwest to the Lower Rio Grande and then across that stream, thence having them turn west-northwest through northern Tamaulipas, Nuevo Leon, and Coahuila, and then crossing the Rio Grande again before coming to La Junta de los Rios. Davenport and Wells and Krieger are the proponents of this route.

The first two categories will not be discussed here. The New Mexican school's view was pretty thoroughly demolished toward the close of the last century by Bandelier (1890). Judge Coopwood's route was examined and rejected by Baskett and by Williams.⁹ However, the archeological evidence which will be adduced to question the feasibility of the "all-Texas" route may be applied to the first two categories of routes also.

All of the authors or routes in print (as distinguished from unpublished theses) emphasize geographic, geological, vegetational, and zoological factors in tracing their course. In considering whether Cabeza de Vaca went, more or less, straight across central Texas, staying north of Mexico and the Big Bend country as Ponton and M'Farland and Hallenbeck have him do, or went through northeastern Mexico and entered the Big Bend region of Texas as Davenport and Wells and

⁷ Hill does cause Cabeza de Vaca to cross and re-cross the Rio Grande just before La Junta de los Rios is reached in order to obtain the right number of river crossings.

⁸ This term was evidently first employed by Hill and is utilized by Williams, 1939, pp. 72, 82-83, in his attempt to categorize the routes. The use of the term is symptomatic of the ethnocentric and anachronistic approaches most authors have utilized in considering the question.

⁹ Baskett, 1907, Pt. I, and Williams, 1939, pp. 50-56. Curiously, Hallenbeck, 1940, who gives the most complete summary of routes theretofore published, seems to have ignored Coopwood. Since Hallenbeck's route depends very largely upon the assumption that buffalo did not occur south of the Pecos, and since Coopwood devotes considerable space to documenting the historic occurrence of buffalo in the Big Bend and northern Mexico, this oversight is unfortunate.

Krieger have him do, it seems to the present writer that three descriptions, susceptible to archeological investigation, in the *Naufragios* need to be considered:

(a) The description of rabbit hunting with clubs "three palms in length."

Going through these valleys each Indian carried a club three palms in length. They all moved in a front and whenever a hare (of which there are many) jumped up they closed in upon the game and raised such blows upon it that it was amazing to see . . . (Cabeza de Vaca, in Bandelier, 1904, pp. 142-143).

(b) The curious description of the disciplining of a child:

In more than fifteen days that we remained with them we never saw them talk together, neither did we see a child that laughed or cried. One child, who had begun to cry, was carried off some distance, and with some very sharp mice-teeth they scratched it from the shoulders down to nearly the legs (*op. cit.*, p. 148).

(c) Finally, Cabeza de Vaca's mention of their first encounter with sedentary agricultural Indians:

. . . Alonso del Castillo and Estevanico, the negro, left with the women as guides, and the woman who was a captive took them to a river that flows between the mountains, where there was a village, in which her father lived, and these were the first abodes we saw that were like unto real houses. Castillo and Estevanico went to these and, after holding parley with the Indians, at the end of three days Castillo returned to where he had left us, bringing with him five or six of the Indians. He told how he had found permanent houses, inhabited, the people of which ate beans and squashes,¹⁰ and that he had also seen maize (Bandelier, 1904, pp. 149-150).

Now, both because Cabeza de Vaca is not very specific about where the events cited in (a) and (b) took place, and because there is a difference of perhaps 800 miles north to south, between the routes, at the points when these events occurred, it is not possible to be very specific about location. However, a reading of the *Naufragios*, or of Oviedo, at least makes clear that events (a) and (b) transpired after the wanderers had left the Gulf coast and after they had left the Indians who ate "tunas" (the fruit of the prickly pear) and before they reached the first sedentary agricultural village. To possess verisimilitude, therefore, a route must, after the tuna fields are left behind, go through a region where the rabbit stick was employed and through an area

¹⁰ In the *Naufragios* this is "melones." Bandelier, 1904, thinks squashes were meant.

where the children were disciplined by scratching with rodent jaws.

Rabbit sticks or clubs are known archeologically from a number of sites in southwestern Texas, notably the area about the mouth of the Pecos and the Big Bend; they also occur in the adjacent area of northern Coahuila and Nuevo Leon. They do not appear in the Llano Estacado and are found only rarely north of the Big Bend. The route of Hallenbeck barely touches the northern extremity of known distribution of the rabbit stick in western Texas. That of Ponton and M'Farland does dip into rabbit stick country about the mouth of the Pecos; and that of Hill, by virtue of his southern dip through the Big Bend to La Junta de los Rios, goes through a considerable portion of the area. On the other hand, the route of Davenport and Wells and that of Krieger traverse, from east to west, the whole area of known rabbit stick distribution in western Texas and adjacent northern Mexico. The writer has discussed this problem with three archeologists at The University of Texas (Dee Ann Suhm, T. N. Campbell, and Jeremiah F. Epstein). All of us are agreed that Hallenbeck's route appears to lie on the northern periphery of, or above, the known rabbit stick distribution. All of us are, however, also agreed that the actual distribution of rabbit sticks may have been wider and that lack of preservation (due to lack of dry caves) and/or lack of excavation may lead to a faulty view of such distribution.

In the matter of the rabbit sticks, therefore, the "Mexican Detour" routes appear to be the best bet, with Hallenbeck's route the most dubious of the five under consideration, although none of the routes can be conclusively ruled out on this basis.

The matter of the rodent jaws is more esoteric and certainly singular. In 1936, A. M. Woolsey found a "medicine bundle" in Horseshoe Cave that included eleven rodent jaws. Both Butler and Taylor noted this point in master's theses and quoted the above description in the *Naufragios*. Butler located the wanderers near Presidio at the time of the incident; Taylor located them near the mouth of the Pecos.¹¹

If from this unique archeological find we may assume that peoples of the late prehistoric period used rodent jaws for the purpose described by Cabeza de Vaca, then the "Mexican Detour" routes and Ponton and M'Farland all pass through regions where Cabeza de Vaca might

¹¹ Butler, 1948, p. 18; Taylor, 1949a, pp. 111-112. Horseshoe Cave is located about five miles ENE of the mouth of the Pecos River. It is Site 50B8-1 in The University of Texas' former quadrangle numbering system and is shown as Site 12 in Taylor's (1949b) map of archeological sites in the area.

have seen such an incident; on the other hand, Hallenbeck's route is again far to the north.

The use of rabbit sticks and rodent jaws has not, heretofore, been discussed as evidence for determining Cabeza de Vaca's route. However, the third piece of archeological evidence—the location of the first agriculture and permanent dwellings on the route—has been discussed at great length. It has been so discussed because the Espejo expedition in 1582, at the junction of the Conchos River and the Rio Grande, encountered Indians who

. . . gave us to understand through interpreters that three Christians and a Negro had passed through there, and by the indications they gave they appeared to have been Alonso (sic) Nunez Cabeza de Vaca, Dorante Castillo Moddonado (sic), and a negro . . . (Pacheco y Cardenas, 1871, pp. 105–108, quoted in Krieger, 1955).

There are three other documentary locations of the route of Cabeza de Vaca which appear in about the century following the journey.¹² None of these, however, is nearly as explicit as the Espejo location. Thus, as Albert Williams points out, any tracing of the route of Cabeza de Vaca must go through La Junta de los Rios or the tracer must show cause to the contrary.

The three principal adherents of the "all-Texas northern route" have dealt with the problem in a variety of ways.

(1) Ponton and M'Farland ignored, or did not know of, the Espejo account. Since both Bancroft, in 1886, and Bandelier, in 1890, had discussed this very point, the omission would appear about equally serious, whether done by design or oversight.

(2) Hallenbeck faces the issue squarely and presents a nine-point argument to show that the Espejo account is in error. These nine points (see Hallenbeck, 1940, pp. 213–215) actually fall into five arguments, as follows:

(a) That Cabeza de Vaca could not have reached La Junta de los Rios because this would not jibe with Hallenbeck's tracing of the preceding route.

¹² In de Leon, 1643, quoted in Alessio Robles, 1939, who locates the wanderers in Nuevo Leon near Cerralvo; the better known accounts of Castañeda, who implies that Coronado's expedition crossed the track of Cabeza de Vaca on the Staked Plains; and Jaramillo who, chronicling the same expedition, states that they met an old Indian who had seen the four wanderers nearer to New Spain.

(b) That Cabeza de Vaca could not have been at La Junta de los Rios because this would not fit with Hallenbeck's tracing of the subsequent route.

(c) That the Espejo account was erroneous, or misleading, in stating that the Indians said three white men and a Negro had passed through La Junta de los Rios, and that Castañeda's mention of Cabeza de Vaca on the Staked Plains is more reliable.

(d) That, while it is true that there is no archeological evidence of agriculture at the point above El Paso where Hallenbeck has Cabeza de Vaca strike the Rio Grande, subsequent archeological investigation might reveal such evidence.

(e) That Cabeza de Vaca could not have been at La Junta de los Rios because this would place him too far south of the range of the buffalo and too far south for the range of the piñon at any altitude which Cabeza de Vaca touched.

Concerning the first two arguments, all that needs to be said is that they constitute an excellent example of *post hoc, ergo propter hoc* reasoning.

In contending that the Espejo account is not reliable and that the Castañeda account is, Hallenbeck is in disagreement with every authority whom the writer has consulted, particularly Hammond and Rey and Krieger. Hammond and Rey, translators of both accounts, are convinced that the Jaramillo account is the more valid. In the course of developing this theme, Hallenbeck translated Jaramillo's statement that Coronado's men met an old Indian who had seen the wanderers, but "mas acia de Nueva España" as "near there but somewhat toward New Spain." It appears to me that the better translation would be "much nearer to New Spain."

It is a curious fact that Hallenbeck only adduces "archeological evidence" twice in his study of Cabeza de Vaca's route. In the first case he denies that there is any "*humana dejecta*" about the mouth of the Pecos River (Hallenbeck, 1940, p. 253). As a matter of fact, there are at least 48 archeological sites within a thirty-mile radius about the mouth of the Pecos, a number of them visible from the juncture of that stream with the Rio Grande (Taylor, 1949b). In the second case, Hallenbeck acknowledges that Cabeza de Vaca encounters agriculture, but his preconceptions force him to place Cabeza de Vaca in an archeologically non-agricultural area. He therefore expresses the hope that subsequent research will turn up evidence of agriculture in that area. Such hope has not been realized by subsequent research. Indeed, as will be shown, subsequent archeological research has demonstrated rather strongly that the area about the juncture of the Conchos and

the Rio Grande is the only spot where Cabeza de Vaca could have encountered permanent habitations and agriculture in this stage of his journey.

In 1899 Coopwood painstakingly documented the presence of buffalo throughout southwestern Texas and adjacent northern Mexico. Such southwestern explorers as Ugalde in the eighteenth century (Nelson, 1936, p. 200) and Froebel in the nineteenth century (Froebel, 1859, p. 427) mention the presence of the buffalo west of the Pecos in the Big Bend in the very region where Hallenbeck denies that they occurred (Hallenbeck, 1940, p. 252, footnote 308). Archeological excavation has also established the prehistoric occurrence of the buffalo in southwestern Texas. As to the occurrence of the piñon nut, in his doctoral dissertation Krieger adduces evidence that the piñon occurs at relatively low altitudes in Nuevo Leon and Coahuila. The present writer has seen piñon growing in the region through which Krieger's route passes and far south of Hallenbeck's indicated distribution.

In discussing Hallenbeck's zoological, botanical, and climatological observations, Krieger characterizes these as preposterous. It is difficult to take issue with this judgment. At one point in his study Hallenbeck (1940, pp. 159-160) goes so far as to determine that Cabeza de Vaca must have been on the Pedernales River in mid-October, because the mid-winter isothermal line of 56° passes near there and Cabeza de Vaca mentions, at this point in his narrative, being chilled at night! It need hardly be pointed out here that, depending on the year and the vagaries of the weather, this phenomenon could have occurred anywhere from Durango to Manitoba in mid-October.

Nonetheless, while admitting the inadequacy of Hallenbeck's work, his publication deserves careful study because of the vast amount of data it contains and also because of his interpretations. It is unfortunate that Hallenbeck's study is probably the most widely distributed and perhaps the most widely accepted by historians.

(3) Hill capitulates at this point by bringing the Cabeza de Vaca party due south through the Big Bend to La Junta de los Rios. The present writer can find nothing in the *Naufragios* to justify the view that the wanderers walked through the whole of the Big Bend from north to south. Indeed, since this trek occurs during a part of the journey when Cabeza de Vaca assures us that he is going west, we must assume distortion by Hill or hallucination by Cabeza de Vaca. Hill traced Cabaza de Vaca's route through a region with whose geography he was intimately familiar. This led him to a route far to the north of the Mexican border. However, since he accepted the validity

of the Espejo account, he was forced to turn the party south through the Big Bend.¹³

Considerable attention has been given in the preceding paragraphs to La Junta de los Rios as a supposedly fixed point in the proposed routes of Cabeza de Vaca by the three leading exemplars of the "all-Texas route." The reason for this detailed consideration is that we must either accept the implications of the Espejo account or deny the validity of the Espejo account as a prime requisite in tracing any route for Cabeza de Vaca.

As it happens, recently adduced archeological evidence gives strong inferential support to the acceptance of La Junta de los Rios as a point on the wanderers' route. In 1952 J. Charles Kelley published an important study of agricultural settlements on the Rio Grande, in the course of which he remarks (in partial summary):

Prior to the expansion of the puebloan occupation of the Rio Grande region in the sixteenth century, there had been an earlier period, c. A.D. 1400, of even greater restriction of population than in the eighteenth century. This catastrophic reduction of the sedentary cultures of the Rio Grande, like that of the later eighteenth century, resulted in widespread desertion of marginal areas and concentration of the surviving population in the better-watered areas adjacent to La Junta. It also coincided with an apparent adverse fluctuation in climatic conditions, inferred from geological and distributional evidence. At about the same time, there had also appeared in the region the ancestral Jumano and Cibolo—perhaps refugee hunters from the Great Plains evicted from their domain by the same climatic change (Kelley, 1952, pp. 382–383; also, see map, p. 360).

Kelley does not consider the route of Cabeza de Vaca and does not examine the account of La Junta de los Rios contained in the *Naufragios*. However, Krieger (1955, pp. 159–163 and Fig. 9) summarized those portions of Kelley's article which bear upon the problem of Cabeza de Vaca's route and demonstrated that this archeological evidence neatly ties in with the description of the first agricultural communities described in the *Naufragios* and in Oviedo and with the Luxan account of the Espejo expedition. Kelley's evidence and Krieger's analysis make it clear that the region of La Junta de los Rios is the only area which could have been where the wanderers first encountered agriculture. Since this conclusion corresponds exactly with the

¹³ Hill's accounts were published in newspapers rather than in journals and are not generally available today. Neither Hallenbeck nor Krieger includes a map of Hill's route. A. C. Williams (1939) does. Krieger (1955) and A. C. Williams both give rather brief critiques of Hill's route.

report of the Espejo expedition, the matter would appear to be settled unless new evidence is adduced.

Interestingly enough, both Kelley and Krieger fail to note (and so did the present writer in his previous studies of the problem) that O. W. Williams reached exactly the same conclusions in 1899, evidently without knowledge of the Espejo account and without archeological data. Williams simply determined that the area about La Junta de los Rios was the one region in western Texas and adjacent northern Mexico which would support "*temporale*" agriculture (that is, agriculture without irrigation) under semi-drought conditions. His map locating the region of agriculture is remarkably similar to Kelley's location.¹⁴

The weight of the archeological evidence would, thus, seem to indicate that the "all-Texas routes" of Ponton and M'Farland, Hallenbeck, and Hill are not tenable. On the other hand, both southern or "Mexican routes," those of Davenport-Wells and Krieger, appear acceptable in the light of data here presented. Of these two routes, Krieger's appears to be the better—certainly it is by far the more thoroughly presented and documented. Unfortunately it has not yet been published and the hectographed doctoral dissertation is in Spanish.

Archeological Problems Presented in the Naufragios

There are three references in Cabeza de Vaca's account which puzzle and fascinate the writer, and which may be susceptible to archeological inquiry:

(1) The location of the shell middens on the mainland opposite Mal-Hado Island.

(2) The method of grinding mesquite beans at the crossing of the Rio Grande (river so identified, though at different points, by Krieger and by Davenport and Wells).

(3) The use of stone boiling by an agricultural people at or near La Junta de los Rios (point so identified by Krieger, Davenport and Wells, and others).

The location of the island upon which Cabeza de Vaca and his com-

¹⁴ Williams, 1899, p. 63. The writer was fortunate in having accompanied Dr. Kelley on part of the survey work incident to his study of La Junta de los Rios. It is his memory that neither Kelley nor the writer was aware of Judge Williams' investigations a half century earlier. The methods followed by Kelley in determining the nuclear agricultural area under drought conditions correspond closely to Williams' described techniques. In addition, of course, Kelley had archeological and ethno-historical evidence unavailable and/or unknown to Williams.

panions were first shipwrecked and from whence they began their wanderings has been a matter of considerable scholarly debate. Called Mal-Hado and briefly described by Cabeza de Vaca in his *Naufragios*, it has been located by various writers everywhere from the mouth of the Mississippi to Padre Inland. The more competent scholars have restricted themselves to a somewhat more narrow range from Isle Dernier off the west coast of Louisiana to Mustang Island off Corpus Christi Bay on the Texas coast. More recent publications tend to concentrate on Galveston Island or the San Luis peninsula (which Davenport and Wells think was an island four hundred years ago and which Hallenbeck contends was even then a peninsula).

So far as the writer is aware, no effort has been made to identify this island from archeological evidence. All authorities seem to rely first upon the physical description of the island and second upon identification of the island based upon distances given by Cabeza de Vaca to even more tenuous landmarks once the journey was begun. However, Cabeza de Vaca specifically mentions oyster shell middens with lodges pitched upon them, these being located on the mainland opposite Mal-Hado. The Indians from Mal-Hado lived here three months out of each year collecting oysters. A number of Spaniards were employed collecting oysters here from February to April of 1529 (Bandelier, 1904, p. 68).

Now, depending upon how one interprets Ovieda and Cabeza de Vaca, something between eighty and ninety-five Spaniards got off the wrecked barges on Mal-Hado. Fifteen or sixteen survived to the following spring. We know that these men were in possession of a considerable amount of personal goods and equipment and that these were taken from them by the Indians.

T. N. Campbell informs the writer that shell middens can be found along every Texas bay from the Louisiana line to Corpus Christi, so that archeological survey probably will not prove too effective an aid in identifying Mal-Hado. Excavation, however, might prove useful, since there is a chance that some of the artifacts from this expedition might have survived.

The writer is perfectly cognizant of the objections most professional archeologists will raise to such an idea. As one who was invited to go and find the cannon ball that the Spaniards fired over the Makah Indian village at Cape Flattery in early 1792, he can appreciate the needle-in-the-haystack effect of such a proposition. However, we are not here dealing with one putative artifact, but with the possessions of at least eighty men taken by two tribes of Indians in a few months.

A second objection may well be that the climatic conditions along the Texas coast will long since have destroyed any ferruginous metals and surely leather, textiles, etc. For that matter, the shell middens in question may long since have been destroyed by natural and/or human agents. This is not only possible, it is probable; but it would seem worth-while to make an effort at such location and excavation.

Finally, there may be the objection that Spanish artifacts, if found, could not be attributed to the Panfilo de Narvaez expedition's survivors. It is true of course that there was subsequent Spanish contact on the Texas coast, but it was much later and probably consisted of a different category of artifact deposition in the main.

Some time in July of 1535 the wanderers crossed a river "as wide as the Guadalquivir." Davenport and Wells identify the river as the Rio Grande and the point as about the present site of Reynosa, Tamaulipas. Krieger also identifies the river as the Rio Grande but favors a point approximately mid-way between Rio Grande City and Laredo. In any event, just before reaching the river Cabeza de Vaca halted at a village where he witnessed the preparation of flour evidently made from mesquite beans.

. . . This *mezquiquez* is a fruit, which while on the trees is very bitter and is like the carob bean, and it is eaten with earth, and with this it becomes sweet and is good to eat. The way they prepare it is this: they dig a hole in the ground, of the depth each one wants, and after throwing the fruit into the hole, with a stick as thick as a leg and one and a half fathoms long, they pound until it is powdered; and besides the earth that gets into it from the pound they bring several handfuls and throw them into the hole and keep on pounding for another while, and after this they empty it into a container like a pannier and add enough water (as it may be needed) to cover it, in such a way that there is water on top, and he who has mashed the meal tastes it, and if it seems to him that it is not sweet enough he calls for earth and adds it to the meal, and this he does until he finds it sweet, and all of them sit around the pannier and every one reaches out with his hand and takes what he can; and the seeds are thrown on some hides together with the peelings; and he who has prepared the meal takes them (the seeds and peelings) and puts them back into the pannier, and adds water as he did before, and they, again, squeeze out the juice and water of them, and the seeds and peelings are set again on the hides, and they do this three or four times at every pounding; and those who are at this banquet, which for them is a great occasion, get very big bellies, from the earth and water they have swallowed . . .¹⁵

¹⁵ Cabeza de Vaca, quoted in Krieger, 1955 (English translation), pp. 93-94. Smith, 1871, pp. 140-141, and Bandelier, 1904, pp. 126-127, each give slightly different translations.

Concerning this description Krieger has the following comments:

. . . The use of wooden pestles to pound the beans agrees very well with archeological observations within the Falcón Reservoir basin and nearby areas, for milling stones and manos—quite common in other parts of Texas—were here found to be quite absent. A half dozen small stone pestles have been found, but no stone mortars, and wooden mortars would not, of course, be preserved. Archaeology thus agrees with de Vaca's notes in this part of Texas, but would not in any other part. It is also significant that when he compiled his generalizations on all the tribes up to and including the Cuchendados . . . no mention whatever was made of mesquite up to that time. Yet it was only two leagues from the Cuchendados to the village where the meal was being prepared. There thus seems to be a close linkage in the use of mesquite for food and the use of wooden pestles. The "container" used was probably of basketry as it was likened to a pannier.¹⁶

This statement is a bit puzzling. Surely Krieger does not mean to imply that there would be stone mortars large enough to accommodate "a stick as thick as a leg and one and a half fathoms long." Perhaps he means that had stone mortars been available the use of a large pounding stick and an earthen pit would have been abandoned. In any event, the writer is not confident that this is the only part of Texas in which milling stones and manos are known to have been absent.

If archeological evidence is available to indicate that the area about the present Falcón Reservoir contains food preparation pits of the sort described by Cabeza de Vaca, it would unquestionably be of great value in tracing the route. Krieger did the initial archeological survey in the Falcón Reservoir area and subsequently worked with materials excavated in this region. It is unnecessary to note here that he is one of the most competent archeologists currently working on the North American scene. The writer suspects that a sentence or two has been left out of the discussion or that in subsequent publication Krieger proposes to present more complete archeological data.

Finally, there is the curious matter of stone boiling practiced by a putatively agricultural people. When Cabeza de Vaca and his companions reached the first agricultural settlements on the Rio Grande

¹⁶ Krieger, 1955, p. 97. The reader should be warned that heretofore citations to Krieger, 1955, have referred to the hectographed copy of the dissertation in Spanish. At this point in preparation of the manuscript, the writer did not have access to this version of Krieger's work and was employing a typescript English version from the Department of Anthropology files at The University of Texas. There is a slight discrepancy in page numbers between the two. In any event, this description and discussion occurs in the section labeled *Leg C*.

(identified by Davenport and Wells and by Krieger as La Junta de los Rios), they noted the following method of food preparation.

They gave us to eat beans and squashes; their way of cooking them is so new (to us) that on that account I want to mention it here, so that it can be seen and it may be known how strange and diverse is the human ingeniousness and his industries (man's). They do not have bowls and in order to cook what they want to eat, they fill up half a calabash, big, with water, and on the fire they heat plenty of rocks of the ones that catch fire most easily, and fire them; and when they see them (the rocks) afire they take them with some wooden tongs, and throw them inside the calabash with the water, until they make it boil with the fire that the rocks carry, and when they see that the water is boiling they put in it what they want to cook, and during all this while they do not do anything else but to take out some rocks and set others in so that the water boils in order to cook what they want, and this is the way they cook it.¹⁷

In both the Old World and the New World agriculture, at least in the nuclear areas, preceded pottery. Thus it may be assumed that stone boiling was a method of cooking employed at very early times by agricultural peoples. However, so far as the writer is aware, there is no concrete archeological evidence to support this assumption. A search of the archeological and ethnological literature does not yield another instance of an agricultural people who practiced stone boiling. Krieger (1955, pp. 146-147, 155-156) discusses this matter at some length.

Probably the best hypothesis for this phenomenon is that the wanderers first encountered the Jumano, who had just entered the region, were developing a symbiotic relationship with the agricultural peoples living about the juncture of the Rio Grande and the Conchos, but had not yet adopted pottery. This explanation would fit very well with Kelley's (1952) remarks concerning the appearance of the Jumano in the area some time in the fifteenth century. It is one of the explanations offered by Krieger, and it is the explanation given by Epstein (verbal communication, November, 1960).

If this explanation is correct, however, there should be agricultural levels in some of the peripheral sites about La Junta de los Rios which are pre-ceramic or non-ceramic in character, or at least lacking in certain forms of utilitarian ceramics, whereas contemporaneous levels at La Junta de los Rios would possess these wares.

Alternatively, it would seem possible that Cabeza de Vaca was mis-

¹⁷ Krieger, 1955, pp. 142; see also 153-154, and Smith, 1871, pp. 161-162. It should be noted that Bandelier and Krieger render "*melones*" as "squashes," while Smith omits the term.

taken in assuming that the "people of the cows" were actually agriculturalists. Instead, they may very well have been engaged in the barter of buffalo meat for agricultural products from their sedentary neighbors. If this was the case, and they led a nomadic existence, the utilization of pottery might have been impractical. Analogous situations existed, of course, on the Great Plains in the eighteenth and nineteenth centuries. Here stone boiling was either reverted to or had never been abandoned, and agricultural products bartered from the Prairie Plains were so cooked.

Against this latter explanation stands Cabeza de Vaca's specific statement that the "people of the cows" lived in the first permanent dwellings encountered. Permanent dwellings argue agriculture and, inferentially, pottery.

References Cited

- Alessio Robles, Vito
 1939. Coahuila y Texas. Tomo I. Mexico, D.F.
- Bancroft, Hubert Howe
 1886. History of the North Mexican States and Texas, I. The History Publishing Company. San Francisco.
- Bandelier, A. F.
 1890. Contributions to the History of the Southwestern Portion of the United States. Hemenway Southwestern Archaeological Expedition. Papers of the Archaeological Institute of America, American Series, Vol. 5. University Press. Cambridge, Mass.
- Bandelier, Fanny (translator), and Adolph Bandelier (editor)
 1904. The Journey of Alvar Nuñez Cabeza de Vaca and His Companions from Florida to the Pacific, 1528-1536. Allerton Book Company. New York.
- Baskett, James Newton
 1907. A Study of the Route of Cabeza de Vaca. Texas State Historical Association Quarterly, Vol. 10, Nos. 3 and 4. Austin.
- Belloquin, Andres Garcia
 n. d. Vida y hazanas de Alvar Nuñez Cabeza de Vaca. Madrid.
- Bishop, Morris
 1933. The Odyssey of Cabeza de Vaca. The Century Company. New York and London.
- Bolton, Herbert Eugene
 1916. Spanish Exploration in the Southwest, 1542-1706. New York.
 1921. The Spanish Borderlands: A Chronicle of Old Florida and the Southwest. Yale University Press. New Haven.
 1949. Coronado: Knight of Pueblos and Plains. The University of New Mexico Press. Albuquerque.
- Bolton, Herbert Eugene, and Thomas Maitland Marshall
 1923. The Colonization of North America, 1492-1783. The Macmillan Company. New York.

- Butler, C. T., Jr.
1948. A West Texas Rock Shelter. Unpublished Master's Thesis, The University of Texas.
- Cabeza de Vaca, Alvar Nuñez
1932. Naufragios y comentarios. Espasa-Calpe, S.A. Madrid.
- Coopwood, Bethel
1899, 1900a, 1900b. The Route of Cabeza de Vaca. The Texas State Historical Association Quarterly, Vols. III and IV. Austin.
- Davenport, Harbert
1923-1924. The Expedition of Panfilo de Narvaez. The Southwestern Historical Quarterly, Vols. XXVII-XXVIII. Austin.
- Davenport, Harbert, and Joseph H. Wells
1919-1919. The First Europeans in Texas. The Southwestern Historical Quarterly, Vol. XXII. Austin.
- Davis, W. W. H.
1888. The Spaniard in New Mexico. American Historical Association, Annual Report III, No. 1.
- Dobie, J. Frank
1942. Cabeza de Vaca's Great Journey. The Pan American Union. Washington, D.C.
- Froebel, Julius
1859. Seven Year's Travel in Central America, Northern Mexico, and the Far West of the United States. Richard Bently. London.
- Hackett, Charles Wilson (editor)
1931. Pichardo's Treatise on the Limits of Louisiana and Texas. University of Texas Press. Austin.
- Haines, Helen
1891. History of New Mexico. New Mexico Historical Publishing Company. New York.
- Hallenbeck, Cleve
1940. The Journey and Route of Alvar Nuñez Cabeza de Vaca. The Arthur H. Clark Company. Glendale.
- Hammond, G. P.
1940. Coronado's Seven Cities. Albuquerque.
- Hammond, G. P., and Agapito Rey
1940. Narratives of the Coronado Expedition. The University of New Mexico Press. Albuquerque.
- Hill, Robert T.
1933-1934. Articles in the Dallas Morning News. 1933: July 2, 9, 16, 23, 30; August 20, 27; September 3, 17, 24; October 8, 15, 22, 29; November 5, 19. 1934: February 18; March 4, 11; May 27; June 10, 24; December 30.
- Hodge, Frederick Webb, and Theodore H. Lewis (editors)
1907. Spanish Explorers in the Southern United States, 1528-1543. Charles Scribner's Sons. New York.
- Holden, W. C.
1937. Excavation of Murrah Cave. Bulletin of the Texas Archeological and Paleontological Society, Vol. 9, pp. 48-73.
- Jackson, A. T.
1938. Picture-writing of Texas Indians. The University of Texas Publication No. 3809.

Kelley, J. Charles

1952. Factors Involved in the Abandonment of Certain Peripheral Southwestern Settlements. *American Anthropologist*, Vol. 54, No. 3, pp. 356-387.

Krieger, Alex D.

1955. *Un nuevo estudio de la ruta seguida por Cabeza de Vaca a traves de norte america*. Doctoral Thesis, University of Mexico (hctographed).

Nelson, A. B.

1936. Campaigning in the Big Bend of the Rio Grande. *The Southwestern Historical Quarterly*, Vol. XXXIX.

Oviedo y Valdez, G. Fernandez de

1852. *Historia general y natural de las indias*. Madrid.

Pichardo, José Antonio de

1812. In: Charles Wilson Hackett (editor), *Pichardo's Treatise on the Limits of Louisiana and Texas*. University of Texas Press. 1931. Austin.

Ponton, Brownie, and Bates H. M'Farland

1898. Alvar Nuñez Cabeza de Vaca: A Preliminary Report on His Wanderings in Texas. *The Texas State Historical Association Quarterly*, Vol. I, No. 3, pp. 166-186.

Prince, L. Bradford

1883. *Historical Sketches of New Mexico*. Ramsey, Millett, and Hudson. Kansas City.

Raines, C. W.

1896. *Bibliography of Texas*. Austin.

Read, Benjamine M.

1912. *Illustrated History of New Mexico*. New Mexico Printing Company. Santa Fe.

Sauer, Carl O.

1932. The Road to Cibola. *Ibero-Americana*, Vol. I, No. 3. University of California Press. Berkeley.

1937. The Discovery of New Mexico Reconsidered. *New Mexico Historical Review*, Vol. 12, No. 3, pp. 270-287.

Smith, Buckingham

1851. *The Narrative of Alvar Nuñez Cabeza de Vaca*. George W. Riggs. Washington.

1871. *Relation of Alvar Nuñez Cabeza de Vaca*. New York.

Taylor, Herbert C., Jr.

1948. An Archaeological Reconnaissance in Northern Coahuila. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 19, pp. 74-87. Abilene.

- 1949a. The Archaeology of the Area about the Mouth of the Pecos. Master's Thesis, The University of Texas.

- 1949b. A Tentative Cultural Sequence for the Area about the Mouth of the Pecos. *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 20, pp. 73-88. Abilene.

1951. *Social Change and Cultural Death: A Diachronic Study*. Microfilm publication. University of Chicago.

Twitchell, R. E.

1914. *Leading Facts of New Mexico History*. Vol. I. Los Angeles.

Williams, Albert Calvin, Jr.

1939. The Route of Cabeza de Vaca in Texas: A Study in Historiography. Master's thesis, The University of Texas.

Williams, O. W.

1899. Route of Cabeza de Vaca in Texas. The Southwestern Historical Quarterly, Vol. III, pp. 54-64.

Woolsey, A. M.

1936. Horseshoe Ranch Cave. Field Notes. The University of Texas.

Western Washington College
Bellingham, Washington

Ecological Implications of Fresh-Water and Land Gastropods in Texas Archeological Studies

D. C. ALLEN AND E. P. CHEATUM

Introduction

Many papers which describe geological localities and archeological sites list the associated plant and animal remains without stress paid to the ecological implications of these remains. By the use of these remains, particularly the shells and shell artifacts as aids in interpreting the environment as it then existed, greater significance and interest is added to the study. In this connection the field of ethnoconchology becomes increasingly important. As more investigators make careful ecologic studies of the mollusks from these sites and compile information from these studies, the data gathered will be of material aid in problems concerning the antiquity of man.

While this report concerns the land and fresh-water mollusks found in association with Post-Pleistocene deposits, the foundations of the studies are based upon knowledge gained from mollusks of the Pleistocene in Texas. In the Pleistocene deposits, quite often, mammalian remains are either meager or lacking, whereas snail shells are usually present, if proper collecting methods are used. During recent years, these molluscan faunas are being used more frequently as aids in the correlation of Pleistocene glacial and interglacial stages.

Age Determination

By the use of Carbon 14 techniques, shells are also important in dating deposits, assuming that the original carbon atom has not been changed by carbon from a different age. Libby (1952: 43) and others have demonstrated the usefulness of this test. Urey (1948) also suggested the use of Oxygen 18 in correlating temperatures with geological periods. These tests along with a study of the remains of other organic materials complement each other in enabling the investigator

to arrive at more valid conclusions pertaining to the age of the deposit.

The use of fossil mollusca as aids in determining the age of a deposit is generally accomplished through the use of species now extinct whose geological vertical range has been established. Unfortunately, the correlation of Pleistocene and sub-recent faunas by the use of index fossils is often not possible because few extinct species are known since the earliest Pleistocene times. Since the shell features of fossil and recent forms show few if any morphological changes, one must also assume that the habitat requirements of the species has not undergone unusual changes. Therefore a species which is now restricted to a northern geographical range would be able to survive and propagate in a like habitat of a southern latitude if it were within its climatic tolerances. Consequently the presence of northern *fossil* species found in deposits in areas now occupied solely by southern species could indicate a major sustained climatic change. Other deposits in the area containing similar faunas could be determined as contemporary. Unfavorable weather, such as prolonged droughts of a few years duration, might cause less hardy species to become locally extinct, but such extinctions would not usually be evident in the fossil faunas, for as the climate moderates the species could well re-occupy the area. Any deposit formed during an unfavorable short season would, in all probability, contain accumulated dead shells. Requirements other than favorable climates are important in the establishment of a suitable habitat for snails, so that time studies must be based upon the occurrence of species rather than their absences.

By comparison, the molluscan faunas of the Wisconsin, which is the most recent glacial period, closely resemble the Recent faunas from the same areas. It had thus been concluded that no change would be noted in comparing post-Wisconsin faunas with living faunas. Recently, a snail fauna containing *Discus cronkhitei* (Newcomb), a woodland species, was found in Foard County, Texas, in association with human remains in a deposit estimated to be no more than 2000 years old (Dalquest, 1961). This is a common species in Canadian and Transition faunas, but today it is found no nearer to Foard County than northern New Mexico. It is also interesting to note that in the same deposit the associated vertebrate faunas contained species whose range indicates a climate which lacked the seasonable highs that prevail in the same area today. The lingering occurrence of *Discus cronkhitei* indicates that minor sustained climatic changes since glacial times can be noted. As more sub-recent molluscan faunas are collected for comparison, it is possible that through these shell indicators, many

archaeological sites could be ultimately correlated in much the same manner as the Pleistocene deposits.

Ecological Implications

Even though mollusks constitute a valuable tool in interpreting climatic changes and the surrounding environment, it must be pointed out that mistakes can easily be made in arriving at broad correlations by the use of shells as indices. This was called to attention by Eiseley (1937) in the case of misinterpreting warm and dry periods at the height of glaciation.

As there is a difference in the ecological requirements of each individual species, a study of the requirements of the faunal complex can provide much information about the archeological site. By considering each species in a local fauna, it will be noted that each helps to tell an ecological story, either adding to the description of the locality or complementing and affirming information which has already been noted. There are some limited variations in the normal habitats of molluscan species and these must be considered. Goodrich (1932) states that "many climatical adaptations have had to be made by these animals (snails), many modifications of habit, and, in some degree, of anatomy and physiology, by reason of abundance or scarcity of lime in the soil, variation in supply and kind of food, stream flow, wave pressure, and the chemistry of water." It is therefore obvious that a more extensive collection would reduce the probability of error in ecological interpretations which have been derived from species existing in situations uncommon to their preferred habitat.

The following table lists the more common species of shells found in Texas archeological sites with preferred habitats given for each species.

Because of man's interference in the composition of archeological deposits, quite often the accumulation of shells will not be the result of natural distribution. During the systematic excavation of a cave or rock shelter near Lake Whitney, Texas, many thousands of the prairie snail, *Bulimulus dealbatus* were collected (reported by R. K. Harris of Dallas). These shells occurred most abundantly in zones containing a greater concentration of artifacts, bones, and other objects from the kitchen midden. The *Bulimulus* collected from these zones were of maximum size, and were massed together in such quantities that a natural distribution could be considered quite improbable. The absence of immature shells of *Bulimulus*, which would normally be found in association with the mature shells in a natural deposit, plus a noted absence of other contemporary species, leads to the conclusion that

TABLE 1

Preferred Habitats

| | Quiet permanent water with abundant vegetation | Temporary pools; marshy areas | Permanent streams; sluggish water | Permanent streams; rapid water | Near margins of woodland pools and streams | Deep woodlands | Sparsely wooded areas | Flood plains and grasslands | Semi-arid regions with brush |
|----------------------------------|---|----------------------------------|--------------------------------------|-----------------------------------|---|----------------|-----------------------|--------------------------------|---------------------------------|
| <i>Amnicola integra</i> | .. | .. | X | .. | .. | .. | .. | .. | .. |
| <i>Ferrissia rivularis</i> | X | .. | .. | .. | .. | .. | .. | .. | .. |
| <i>Gyraulus parvus</i> | X | .. | .. | .. | .. | .. | .. | .. | .. |
| <i>Helisoma anceps</i> | .. | .. | .. | X | .. | .. | .. | .. | .. |
| <i>Helisoma trivolvis</i> | X | .. | X | .. | .. | .. | .. | .. | .. |
| <i>Lymnaea bulimoides</i> | | | | | | | | | |
| <i>techella</i> | X | X | .. | .. | .. | .. | .. | .. | .. |
| <i>Lymnaea dalli</i> | X | X | .. | .. | .. | .. | .. | .. | .. |
| <i>Lymnaea obruosa</i> | X | X | .. | .. | .. | .. | .. | .. | .. |
| <i>Lymnaea humilis modicella</i> | X | X | .. | .. | .. | .. | .. | .. | .. |
| <i>Pseudosuccinea columella</i> | X | .. | .. | .. | .. | .. | .. | .. | .. |
| <i>Physa anatina</i> | X | .. | X | .. | .. | .. | .. | .. | .. |
| <i>Succinea</i> | .. | .. | .. | .. | X | .. | X | X | .. |
| <i>Bulimulus dealbatus</i> | .. | .. | .. | .. | .. | .. | X | X | .. |
| <i>Bulimulus alternatus</i> | | | | | | | | | |
| <i>mariae</i> | .. | .. | .. | .. | .. | .. | .. | .. | X |
| <i>Bulimulus schiedeanus</i> | .. | .. | .. | .. | .. | .. | .. | .. | X |
| <i>Carychium exiguum</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Euconulus chersinus</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Zonitoides arboreus</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Retinella indentata</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Hawaiiia minuscula</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Gastrocopta armifera</i> | .. | .. | .. | .. | X | X | X | .. | .. |
| <i>Gastrocopta contracta</i> | .. | .. | .. | .. | X | X | X | .. | .. |
| <i>Gastrocopta cristata</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Gastrocopta procerca</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Gastrocopta pellucida</i> | | | | | | | | | |
| <i>hordeacella</i> | .. | .. | .. | .. | X | X | .. | X | .. |
| <i>Gastrocopta pentodon</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Vertigo ovata</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Pupoides albilabris</i> | .. | .. | .. | .. | X | X | X | X | X |
| <i>Pupilla blandi</i> | .. | .. | .. | .. | .. | .. | X | .. | X |
| <i>Strobilops texas'ana</i> | .. | .. | .. | .. | X | X | .. | .. | .. |
| <i>Holospira roemeri</i> | .. | .. | .. | .. | .. | .. | X | .. | X |
| <i>Anguispira alternata</i> | .. | .. | .. | .. | .. | X | .. | .. | .. |

| | | | | | | | | | |
|------------------------------------|----|----|----|----|----|----|----|----|----|
| <i>Helicodiscus singleyanus</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Helicodiscus eigenmanni</i> | .. | .. | .. | .. | .. | X | .. | .. | .. |
| <i>Vallonia parvula</i> | .. | .. | .. | .. | .. | .. | X | .. | .. |
| <i>Vallonia gracilicosta</i> | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| <i>Humboldtiana chisosensis</i> | .. | .. | .. | .. | .. | .. | X | .. | .. |
| <i>Helicina orbiculata tropica</i> | .. | .. | .. | .. | .. | .. | X | .. | .. |
| <i>Mesodon thyrooidus</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Mesodon roemeri</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Stenotrema leai aliciae</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Polygyra texasiana</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Polygyra dorfeuilleiana</i> | .. | .. | .. | .. | .. | X | X | .. | .. |
| <i>Euglandina texasiana</i> | .. | .. | .. | .. | .. | X | .. | .. | .. |
| <i>Rumina decollata</i> | .. | .. | .. | .. | .. | X | .. | .. | .. |

the snails were gathered by cave occupants as a supplement to their diet. Other camp sites in Texas containing abundant *Bulimulus* in association with kitchen middens have often been noted.

Clams or mussels shells are often found in Archaic zones, but their usefulness as ecological indicators has been somewhat limited. Their natural distribution is usually restricted by land barriers and consequently they are confined to drainage systems of the same rivers today that probably existed during and since Late Pleistocene times. They were no doubt extensively used as food, and their shells often used as containers in cooking, and as implements for working in the soil. Particularly valued shells may have been carried by migrating peoples, and for this reason could possibly indicate the origin and movement of tribes. In recent years, mussel shells have also been used in carbon dating, thus adding greatly to their usefulness to the archaeologist.

Quite often the arrangement or position of shells in the deposit serves as a clue to the method of deposition. For example, in stream deposits the shells are usually stratified with adjacent zones of sparsely distributed shells. This arrangement contrasts sharply with deposits formed by gradual siltation of lakes or ponds where the shells have a more homogeneous distribution throughout the fossil zone.

Collecting Technique

The success in the use of snail faunas as ecological indicators is often in proportion to the effort and care used in obtaining a complete collection. Careful stratigraphic collecting must be made at the archeological site. Boekelman (1936) pointed out the fallacy of a failure to collect broken shells and examine unworked areas near the site for shell remains.

Since many shells of adults are only a few millimeters in length, a special technique must be employed in collecting. An excellent method of collecting fossil shells, as well as small vertebrate remains, is described by C. W. Hibbard (1949). Hand collecting will generally yield only five or six species in a location that will yield 30 or more by proper collecting. Of prime importance in collecting is to see that no intruded recent material be included in the collections, because the absence of locally abundant species can be significant. One must clear the overburden and talus from the collecting locality, thus making certain that surface or recent material is not introduced through weather cracks or root fillings. If possible, remove the matrix in large chunks from zones that appear to be the richest in fossil shells. Take samples from as many different places within the deposit as possible to assure a more complete fauna. Place the large pieces of matrix in burlap bags with care so that fragile (especially so when moist) specimens will not be destroyed. Burlap sacks can be obtained from local feed stores at a nominal cost. About 100 pounds of matrix to the sack is as much as can be easily handled. It is of great importance that the sacks of matrix be thoroughly dried before trying to separate the fossils. Not only will the matrix dissolve better when dry, but fragile bones and shells will withstand washing much better. Place the dry matrix in a container of water, and allow up to 30 minutes for it to become saturated. Small shells will begin to float to the top of the water and should be collected with a fine strainer—a tea strainer will do. The remainder can be easily isolated by washing through a fly screen. Allow the concentrate to dry on the fly screen. With a good magnifying glass, many fossil shells and vertebrate remains can be recovered from the dry concentrate. Plates 1 through 6, supplemented by our brief descriptions, will aid in the identification of shells, but many species must be examined by a specialist for positive identification.*

Fresh-water and Land Gastropods of Texas

The following forms are commonly found in association with archeological materials from Texas. Brief descriptions and ecological notes are given for each form.

* Specimens sent to Dr. E. P. Cheatum, Biology Department, Southern Methodist University, Dallas, Texas, will be identified as rapidly as possible. Archeologists seeking identifications are requested to keep duplicate shells, thus avoiding the necessity of returning specimens.

AQUATIC SNAILS

Family Amnicolidae

Amnicola integra (Say). Fig. 1, No. 1; Fig. 7, No. 3.

Shell: small, conic, dextral (coiling to right); rounded aperture; 5–6 mm.

Habitat: large rivers and other permanent streams.

Family Ancyliidae

Ferrissia rivularis (Say). Fig. 1, No. 3; Fig. 7, No. 12.

Shell: patelliform (limpet-like) or flatly conic; not of spiral form; 3–5 mm.

Habitat: quiet waters, abundant vegetation.

Family Planorbidae

Gyraulus parvus (Say). Fig. 1, Nos. 4 and 6; Fig. 7, Nos. 8–11.

Shell: small, discoidal or disc-like; all spirals of the shell in nearly the same plane; whorls rapidly expanding; 3–5 mm.

Habitat: natural lakes and quiet ponds among aquatic plants.

Helisoma anceps Menke. Fig. 1, Nos. 4 and 6; Fig. 7, No. 4–5.

Shell: planispiral or discoidal, sinistral (coiling to left); about 4 whorls with a rounded body whorl which is sharply angled on each side; 5–12 mm.

Habitat: prefers fresh-flowing water, even swift water; usually not found in stagnant water.

Helisoma trivolvis (Say). Fig. 1, Nos. 4 and 6; Fig. 7, Nos. 6–7.

Shell: discoidal with many equidistant lines of growth; whorls rounded beneath and flattened above; 10–35 mm.

Habitat: may be found in permanent or temporary water, but maximum size is attained in quiet shallow semi-stagnant water.

Family Lymnaeidae

Lymnaea bulimoides.

Shell: conspiral, dextral; aperture or opening from $\frac{1}{2}$ to $\frac{3}{5}$ the length of the shell; 9–12 mm.

Habitat: shallow water near shores of lakes, ponds, and temporary pools.

Lymnaea dalli Baker. Fig. 6, Nos. 22–23.

Shell: dextral; the last whorl is large, half the length of the entire shell; surface with numerous, coarse growth lines, 8–18 mm.

Habitat: shallow water, on mud bottoms and among lake and pond vegetation.

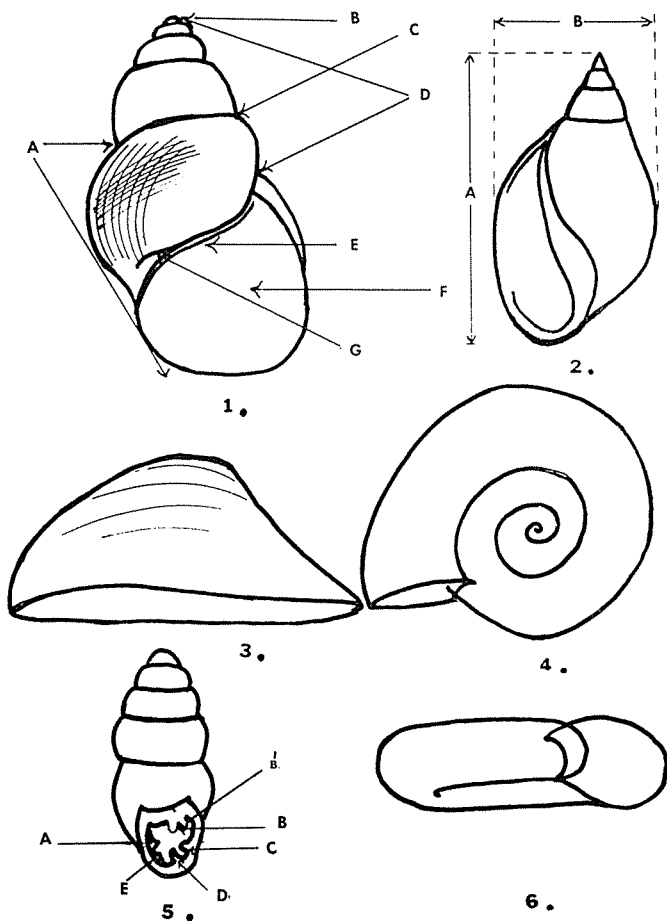


Fig. 1. Shell Types.

1. Conispiral shell of *Amnicola*, showing dextral or "right-handed" coiling. Terms commonly applied to gastropod shells are (a) body whorl, (b) apex or nuclear whorl, (c) suture, (d) spire, (e) callus, a thickening of the inner lip, (f) aperture, and (g) umbilicus, the open space at the base of the shell about which the whorls are formed.

2. Conispiral shell of *Physa*, showing sinistral or "left-handed" coiling, and the method of measuring shells for (a) height, and (b) diameter.

3. Patelliform (limpet-like) shell of *Ferrissia*, a cup-like shell lacking the customary coiling of Gastropod shells.

4. and 6. Discoid shells of the planorbids, *Helisoma* and *Gyraulus* genera. All whorls are approximately in the same plane.

5. Pupoid shell of *Gastrocopta*, showing the lamellae or denticles in the aperture, (a) columellar, (b) parietal, (b') angular-parietal, (c) upper parietal, (d) lower parietal, and (e) basal.

Lymnaea obrussa (Say). Fig. 6, Nos. 16-17.

Shell: dextral; the last whorl is large, half the length of the entire shell; surface with numerous, coarse growth lines; 8-18 mm.

Habitat: shallow water, on mud bottoms and among lake and pond vegetation.

Lymnaea humilis modicella (Say). Fig. 6, Nos. 18-19.

Shell: conic, dextral; the last whorl is large, and growth lines are not as coarse as in *L. obrussa*, and the body whorl is more inflated; 7-12 mm.

Habitat: shallow water among the vegetation of lakes and ponds and in temporary pools.

Pseudosuccinea columella (Say). Fig. 6, Nos. 12-13.

Shell: elongate-ovate, thin, and flat-sided; a lymnaeid species that closely resembles a member of the family Succineidae; the shell is loosely coiled with a flaring aperture that covers $\frac{2}{3}$ of the total length; 10-20 mm.

Habitat: shallow waters of lakes and ponds with abundant vegetation; also inhabits semi-stagnant water.

Family Physidae

Physa anatina Lea. Fig. 1, No. 2; Fig. 7, Nos. 1-2.

Shell: sinistral; aperture occupies $\frac{3}{4}$ of the total length of the shell; 7-12 mm.; size of the shells varies greatly with environment.

Habitat: largest species are found in semi-stagnant water.

LAND SNAILS

Family Succineidae. Fig. 6, Nos. 1-11 (various species)

Shell: several succineid species are found in north Texas, but identifications are made primarily through use of soft parts which are, of course, not available for study; shells obliquely ovate with large flaring apertures.

Habitat: generally speaking this family prefers moist wooded areas.

Family Bulimulidae

Bulimulus dealbatus (Say). Fig. 2, Nos. 1-2.

Shell: the *Bulimulus* shell is globose-conic-shaped, large, and streaked or spotted with white against a grayish background in the species *dealbatus*; 17-23 mm.; shell of this species is thin in contrast to the thick shell of *alternatus* and *schiedeanus*.

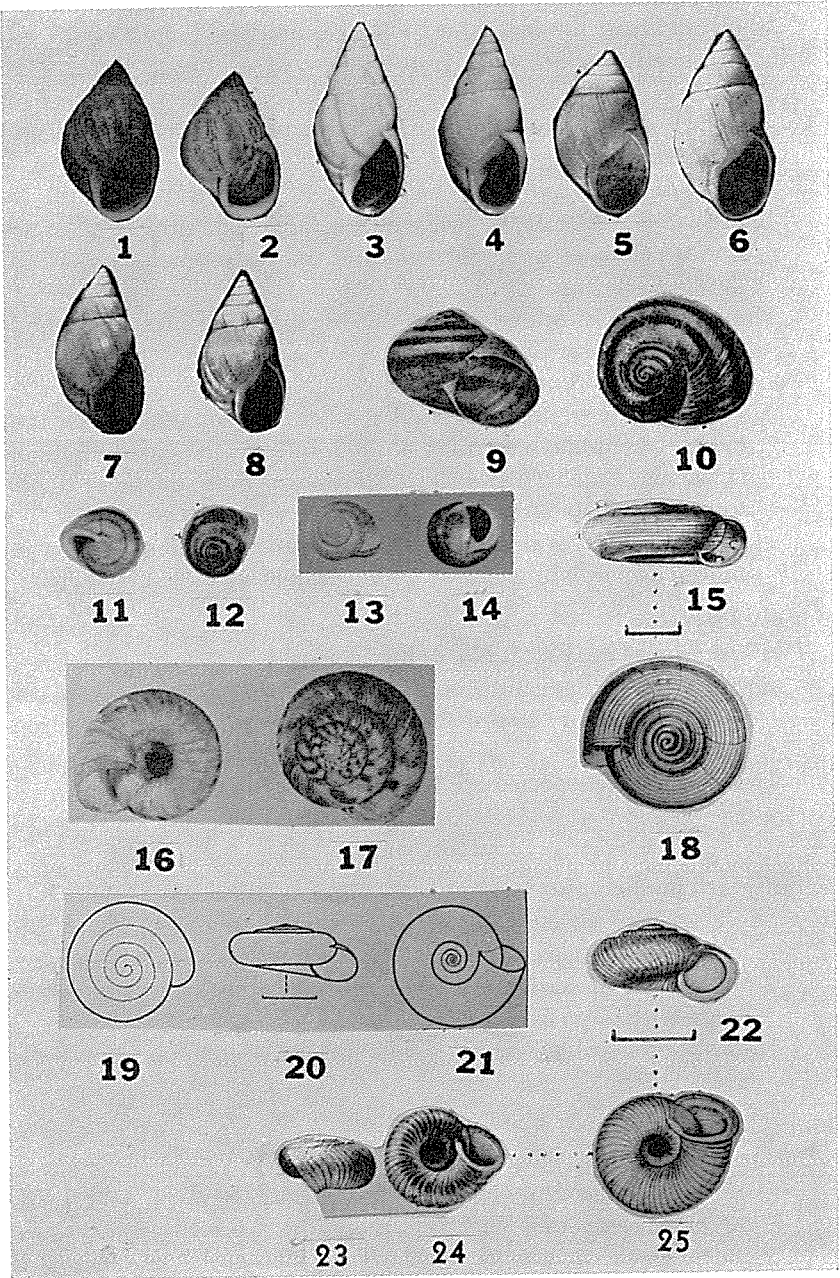


Fig. 2.

Habitat: this is the snail that is characteristic of semi-arid open country and is often called the "prairie snail."

Bulimulus alternatus mariae (Albers). Fig. 2, Nos. 3-4.

Shell: differs from *dealbatus* in that it is larger and much heavier, with a dark brown innerlining; columella frequently toothed; 24-32 mm.

Habitat: a semiarid species in south-central and southwest Texas.

Bulimulus schiedeanus (Pfeiffer). Fig. 2, Nos. 5-8.

Shell: large and rather solid, innerlining is white or tawny; columellar tooth absent; 29-40 mm.

Habitat: west Texas in semiarid regions.

Family Carychiidae

Carychium exiguum (Say). Fig. 3, Nos. 9-10.

Shell: very minute; cylindrical; with a shiny surface; 2 mm.;

Carychium exile is sparsely distributed in north Texas and is distinguished from *C. exiguum* by its radial surface striae.

Habitat: woodland species that prefers moist situations.

Family Zonitidae

Euconulus chersinus (Say) L. Fig. 3, No. 1.

Shell: small, globose-conic; surface smooth; shaped like an old-fashioned beehive and can only be confused with *Strobilops texasiana*, which has distinct and prominent riblets on the surface that do not occur on *Euconulus*; 3-4 mm.

Habitat: a woodland species that can withstand seasonable drought.

Zonitoides arboreus (Say). Fig. 3, Nos. 2-4.

Shell: heliciform, spire depressed; may be confused with *Retinella*, which has spaced radial sculptured lines; *Zonitoides* has a smooth surface and is generally larger; 5-6 mm.

Family Bulimulidae

Bulimulus dealbatus, Nos. 1-2. x 1.

Bulimulus alternatus mariae, Nos. 3-4.
x 1.

Bulimulus schiedeanus, Nos. 5-8. x 3/4.

Family Helminthoglyptidae

Humboldtiana chisosensis, Nos. 9-10.
x 1.

Family Helicinidae

Helicina orbiculata tropica, Nos. 11-14.
x 1.

Family Endodontidae

Helicodiscus eigenmanni, Nos. 15, 18.
x 5.

Anguispira alternata, Nos. 16-17. x 1.

Helicodiscus singleyanus, Nos. 19-21.
x 9.

Family Valloniidae

Vallonia gracilicosta, Nos. 22, 25. x 11.

Vallonia parvula, Nos. 23-24. x 10.

(Scale lines equal 1 mm.)

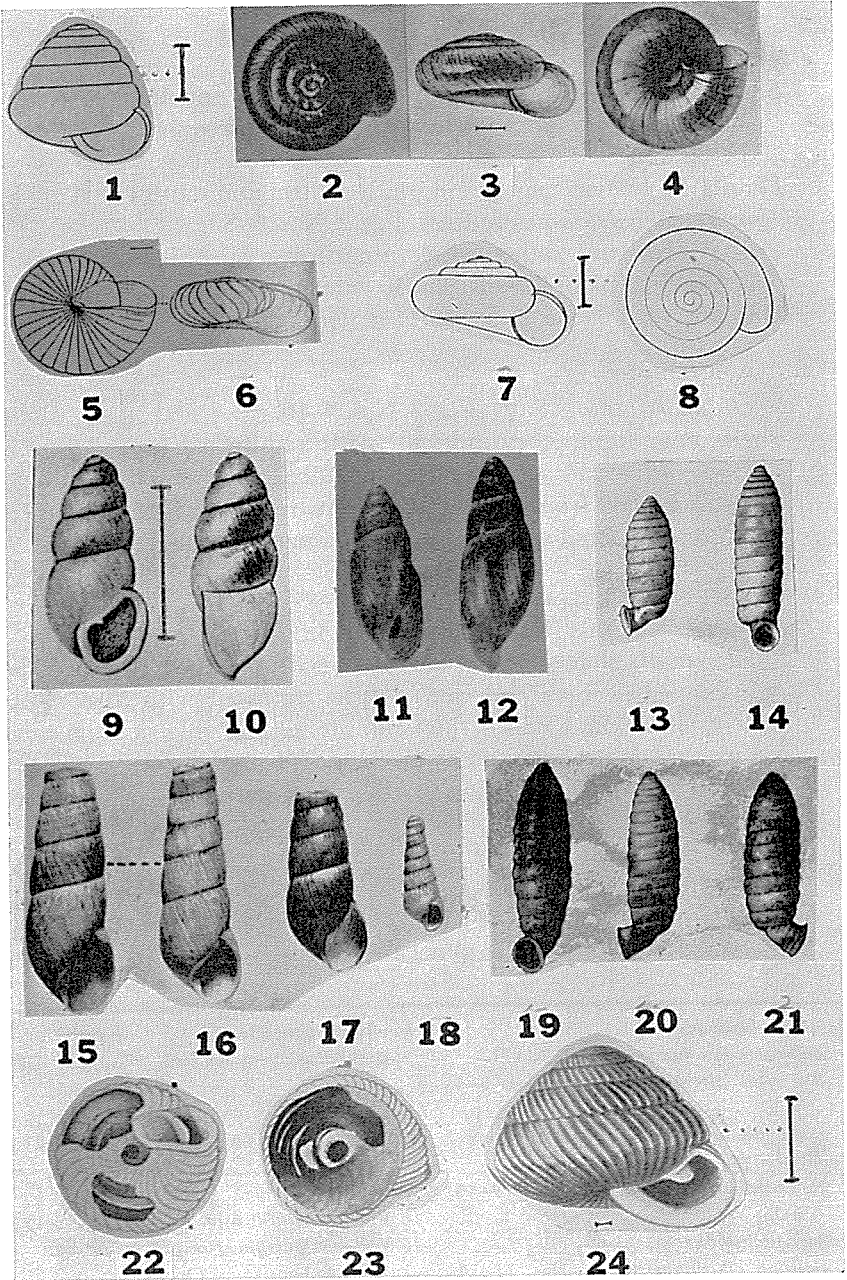


Fig. 3.

Habitat: found in wooded areas and along the borders of streams.

Retinella indentata (Say). Fig. 3, Nos. 5–6.

Shell: heliciform and depressed; can be confused only with *Zonitoides arboreus*, which lacks the spaced radial sculptured lines of *Retinella indentata*; 4–6 mm.

Habitat: lives in the humus of woodlands.

Hawaia minuscula (Binney). Fig. 3, Nos. 7–8.

Shell: heliciform, spire is very low, giving almost plani-spiral appearance; the only shell it is likely to be confused with in Texas is *H. singleyanus*, which is somewhat smaller and has a deeper, more narrow umbilicus (open basal area revealing whorls); 2–3 mm.

Habitat: often found in open grasslands under sticks and stones; also occurs in woodlands.

Family Pupillidae

Gastrocopta armifera (Say). Fig. 1, No. 5; Fig. 4, No. 22.

Shell: largest of the pupillid species in Texas and can be identified by its large size; 3.5–5 mm.; a characteristic pattern of the denticles within the aperture serves to identify species of the family Pupillidae, which in this study includes the genera *Pupoides*, *Pupilla*, *Gastrocopta*, and *Vertigo*.

Habitat: wide variety of habitats and can be found primarily in woodlands.

Gastrocopta contracta (Say). Fig. 1, No. 5; Fig. 4, Nos. 23–25.

Shell: ovate-conic; denticles large and appear to fill the aperture; 2.5 mm.

Habitat: prefers a wooded protected area.

Gastrocopta cristata (Pilsbry and Vanatta). Fig. 1, No. 5; Fig. 5, Nos. 1–4.

Shell: slender and cylindrical; difficult to distinguish from *G. procera* without comparative study of the denticles; 2–3 mm. average.

Family Zonitidae

Euconulus chersinus, No. 1. x 7.

Zonitoides arboreus, Nos. 2–4. x 5.

Retinella indentata, Nos. 5–6. x 6.

Hawaia minuscula, Nos. 7–8. x 8.

Family Carychiidae

Carychium exiguum, Nos. 9–10. x 23.

Family Oleacinae

Euglandina texasiana, Nos. 11–12. x 1.

Family Urocoptidae

Holospira roemeri, Nos. 13–14, 19–21, x 2.

Family Achatinidae

Rumina decollata, Nos. 15–18. x 3/4.

Family Strobilopsidae

Strobilops texasiana, Nos. 22–24. x 12.

(Scale lines equal 1 mm.)

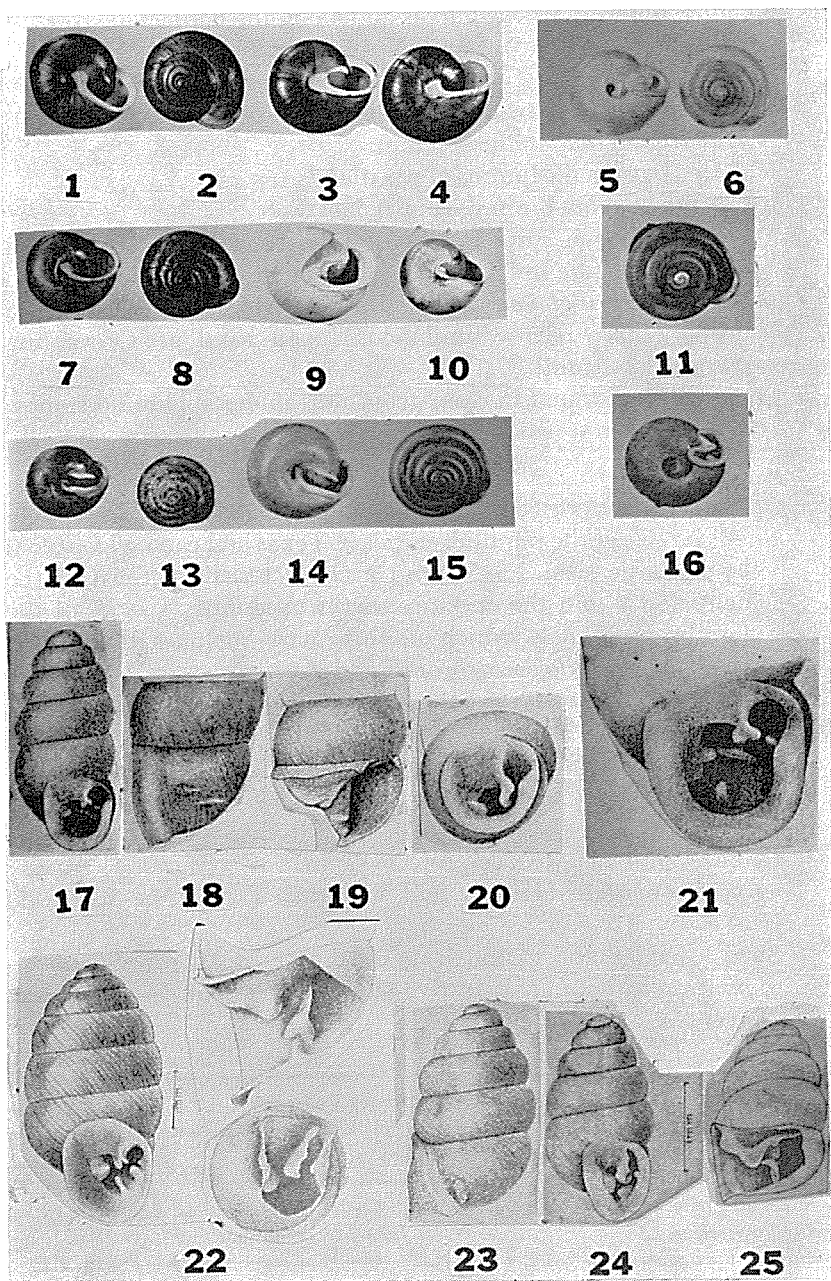


Fig. 4.

Habitat: found in timbered areas and grasslands where protection is adequate.

Gastrocopta procera (Gould). Fig. 1, No. 5; Fig. 4, Nos. 17–21.

See *G. cristata*. Difficult to distinguish from *G. cristata* without comparative study of the denticles. Both species of about the same size and prefer the same general habitat.

Gastrocopta pellucida hordeacella (Pilsbry). Fig. 1, No. 5; Fig. 5, Nos. 9–11.

Shell: differs from *G. procera* and *G. cristata* in its smaller size and more elongate-cylindric shape; 2–2.5 mm.

Habitat: found in open areas that are afforded some protection from nearby trees; also in deep woodlands.

Gastrocopta pentodon (Say). Fig. 1, No. 5; Fig. 5, Nos. 5–8.

Shell: oblong-conic (barrel-shaped) with many (5 to 8) small denticles within the aperture; 2 mm.

Habitat: found primarily in wooded areas.

Vertigo ovata (Say). Fig. 5, Nos. 12–14.

Shell: small, roundly-ovate; spire is conic; genus *Vertigo* distinguished from *Gastrocopta* in that the denticles on the parietal wall (nearest the top of the aperture) number 2 to 3, whereas in *Gastrocopta* the parietal teeth are fused into one twisted denticle; 2–3 mm.

Habitat: found in moist areas under ground clutter and stones.

Pupoides albilabris (C. B. Adams). Fig. 5, Nos. 15–17.

Shell: elongate-conic; apex blunt or obtuse; aperture does not contain teeth; 4–6 mm.

Habitat: hardy species that can inhabit arid situations as well as its preferred wooded habitat.

Pupilla blandi Morse. Fig. 5, Nos. 18–20.

Shell: ovate-cylindric; aperture small and round; usually with one parietal tooth; one columellar and one deep within at base of aperture; 3–3.7 mm.

Habitat: semiarid sections, under rocks and other objects in limestone regions.

Family Polygyridae

Mesodon roemeri, Nos. 1–4. x $\frac{3}{4}$.

Polygyra texasiana, Nos. 5–6. x $1\frac{1}{2}$.

Mesodon thyroidus, Nos. 7–10. x $\frac{3}{4}$.

Polygyra dorfeuilleiana, Nos. 11, 16.

x $\frac{2}{3}$.

Stenotrema leai aliciae, Nos. 12–15. x 2.

Family Pupillidae

Gastrocopta procera, Nos. 17–21. No. 17 is x 12; all others greatly enlarged.

Gastrocopta armifera, No. 22. x 10.

Gastrocopta contracta, Nos. 23–25. x 14.

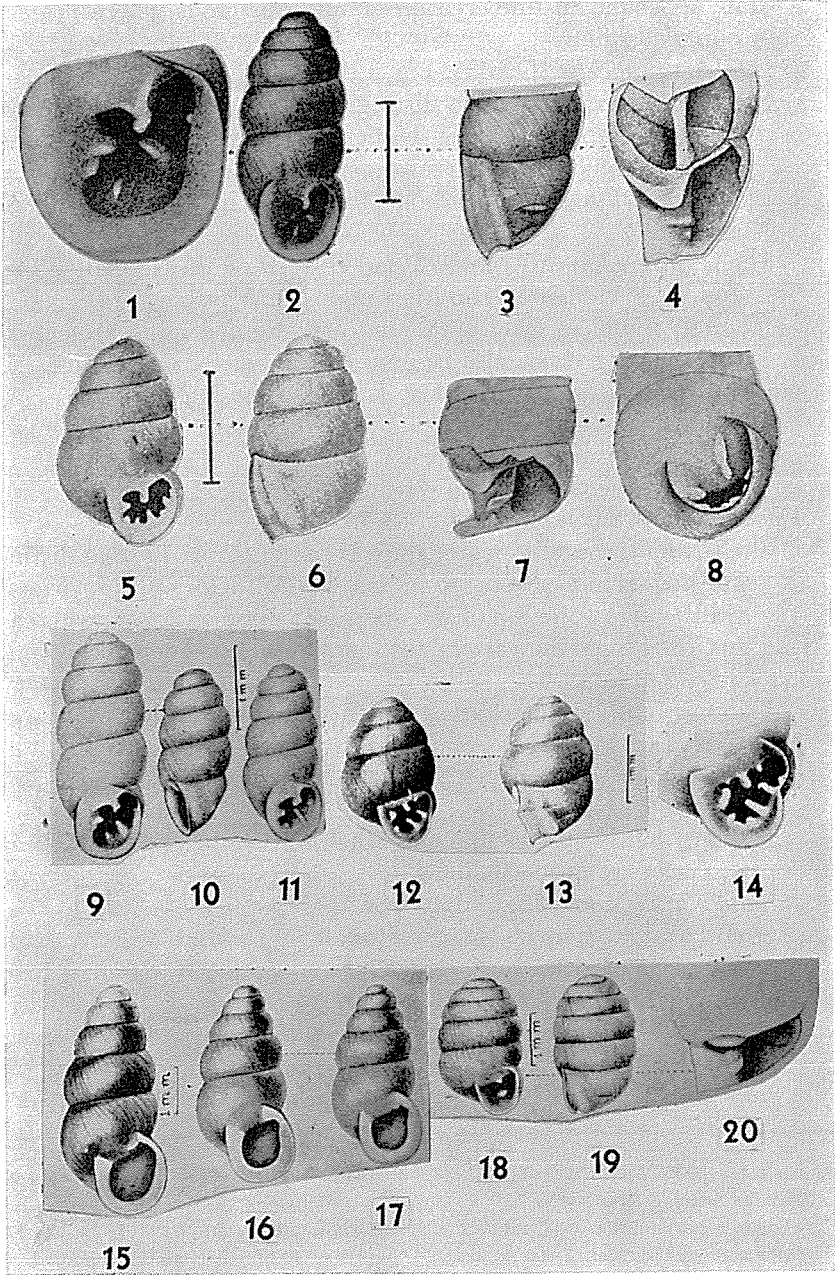


Fig. 5.

Family Strobilopsidae

Strobilops texasiana (Pilsbry and Ferriss). Fig. 3, Nos. 22–24.

Shell: small, dome-shaped, resembling a beehive; might be confused with the genus *Euconulus*, which lacks the strong oblique riblets of *Strobilops*; 2–3 mm.

Habitat: found among leaves in wooded areas and near the border of lakes and streams.

Family Urocoptidae

Holospira roemeri (Pfeiffer). Fig. 3, Nos. 13–14, 19–21.

Shell: conical, with narrowed base and apex; aperture stalked; 12–16 mm.

Habitat: associated with limestone rocks, in crannies, and underneath rocks; apparently thrives in semiarid habitats.

Family Endodontidae

Anguispira alternata (Say). Fig. 2, Nos. 16–17.

Shell: large, and easily recognized by its markings of brownish orange blotches over a neutral ground color; 15–25 mm.

Habitat: a woodland species that is capable of dwelling in upland areas.

Helicodiscus singleyanus (Pilsbry). Fig. 2, Nos. 19–21.

Shell: heliciform; spire depressed (see *Hawaiiia minuscula*); 2–2.5 mm.

Habitat: found beneath leaves in protected wooded areas.

Helicodiscus eigenmanni (Pilsbry). Fig. 2, Nos. 15, 18.

Shell: discoidal, resembling *Hawaiiia minuscula*, but larger, flatter, and coin-shaped; 4–5 mm.; surface of shell has evenly spaced spiral threads that follow the whorls.

Habitat: found near the edges of streams or lakes.

Family Valloniidae

Vallonia parvula (Sterki). Fig. 2, Nos. 23–24.

Shell: flat and ribbed: widely umbilicated; 2–2.5 mm.

Habitat: associated with humus, stones, and other objects that retain moisture.

Family Pupillidae

Gastrocopta cristata, Nos. 1–4. No. 2 is x 15; others greatly enlarged.

Gastrocopta pentodon, Nos. 5–8. Nos. 5–6 are x 17; others greatly enlarged.

Gastrocopta pellucida hordeacella, Nos.

9–11. Nos. 10–11 are x 13; No. 9 enlarged.

Vertigo ovata, Nos. 12–14. Nos. 12 and 13 are x 10; No. 14 greatly enlarged.

Pupoides albilabris, Nos. 15–17. x 7.

Pupilla blandi, Nos. 18–20. Nos. 18–19 are x 8; No. 20 greatly enlarged.

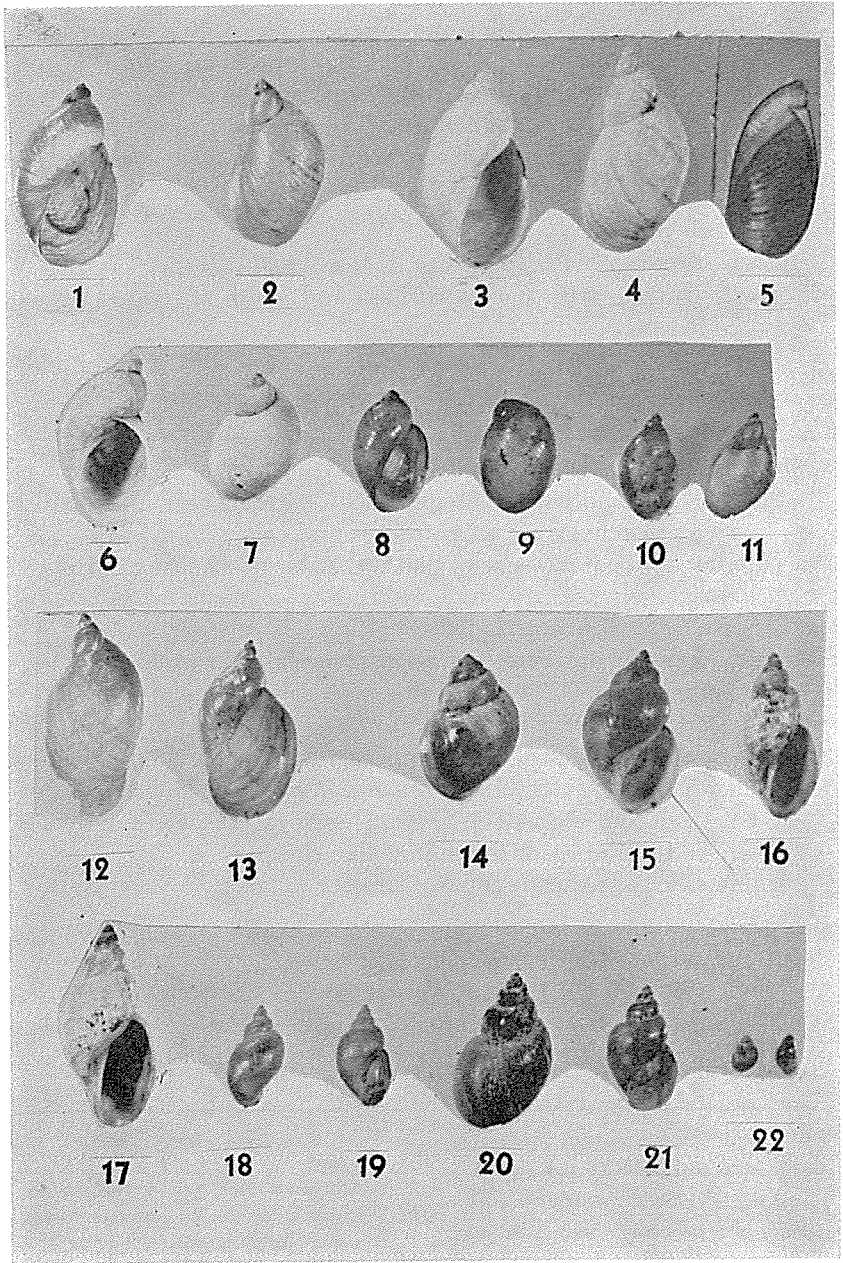


Fig. 6.

Vallonia gracilicosta (Reinhardt). Fig. 2, Nos. 22, 25.

Shell: similar to *V. parvula* except larger; 2.5–3 mm.

Habitat: similar to *parvula*.

Family Helminthoglyptidae

Humboldtiana chisosensis (Pilsbry). Fig. 2, Nos. 9–10.

Shell: largest land species in Texas; marked with 3 dark bands; 25–33 mm.

Habitat: mountains of the Trans-Pecos; in canyons and other protected areas where moisture prevails.

Family Helicinidae

Helicina orbiculata tropica (Pfeiffer). Fig. 2, Nos. 11–14.

Shell: subglobose, spire elevated; not easily confused with other Texas species since internal partitions of spire are absorbed; 7–8.5 mm.

Habitat: this sturdy species is almost drought resistant because of the operculum which can close up the aperture to prevent water loss; may be found in open unprotected fields, but is usually associated with woodlands; one of our few species with arboreal habits; recent shells will vary in color from pale green to orange and red tints over a buff ground color.

Family Polygyridae

Mesodon thyroidus (Say). Fig. 4, Nos. 7–10.

Shell: depressed-globose; spire low; oblique parietal tooth frequently present; 17–23 mm.; may be confused with *Mesodon roemeri*, which usually is larger in diameter and more flattened; 18–24 mm.; height of *thyroidus* is usually 60% or more of the diameter, whereas in *roemeri* it is less than 60%.

Habitat: occurs in heavily wooded areas.

Mesodon roemeri (Pfeiffer). Fig. 4, Nos. 1–4.

See *Mesodon thyroidus*. Both species occur in heavily wooded areas.

Family Succineidae

Succinea concordialis, Nos. 1–2. Circa x 3.

Succinea luteola, Nos. 3–4. Circa x 3.

Oxyloma salleana, No. 5. Circa x 3.

Succinea grosvenori, Nos. 6–7. Circa x 3.

Succinea unicolor, Nos. 8–9. Circa x 3.

Succinea avara, Nos. 10–11. Circa x 3.

Family Lymnaeidae

Pseudosuccinea columella, Nos. 12–13. Circa x 2.

Lymnaea techella, Nos. 14–15. Circa x 2.

Lymnaea obrussa, Nos. 16–17. Circa x 2.

Lymnaea humilis, Nos. 18–19. Circa x 2.

Lymnaea humilis modicella, Nos. 20–21. Circa x 2.

Lymnaea dalli, Nos. 22–23. Circa x 2.

Stenotrema leai aliciae (Pilsbry). Fig. 4, Nos. 12-15.

Shell: heliciform, globose, with elevated spire; aperture contains a single diagonal parietal tooth; 7-9 mm.

Habitat: appears to be restricted to areas that provide permanent moisture; usually found in well protected heavily wooded borders of permanent streams and rivers.

Polygyra texasiana (Moricand). Fig. 4, Nos. 5-6.

Shell: heliciform, spire depressed; inner margin of lip bears two teeth and the parietal callus bears a two-branched tooth; 10-11.5 mm.

Habitat: hardy species; found in open fields as well as in woodlands.

Polygyra dorfeuilliana (Lea). Fig. 4, Nos. 11, 16.

Shell: similar to *P. texasiana*, except that *dorfeuilliana* is smaller (7.5-9 mm.) and the parietal tooth is squarish in front.

Habitat: hardy species; found in open fields as well as in woodlands.

Family Oleacinidae

Euglandina texasiana (Pfeiffer). Fig. 3, Nos. 11-12.

Shell: narrow and oblong; glossy and usually thin; 29-33 mm.

Habitat: well protected areas where abundant moisture occurs.

Family Achatinidae

Rumina decollata (Linnaeus). Fig. 3, Nos. 15-18.

Shell: has a natural broken apex which is plugged at the summit; 22-30 mm.

Habitat: abundant in many parts of Texas and one of the worst garden pests of succulent plants; introduced from the Mediterranean region and included here because of its widespread recent distribution; its presence can often determine the age of a deposit formed since its introduction through early commerce.

Key to the Land Shells of Texas that Occur Most Commonly in Archeological Sites

- A. Parietal wall of shell with deeply seated basal folds extending far back into whorl and one or two emerge from aperture; shell sculptured with oblique ribs.....Family Strobilopsidae
Strobilops texasiana (Pilsbry and Ferriss)-Diam. 2-3 mm.
 Basal folds absentB

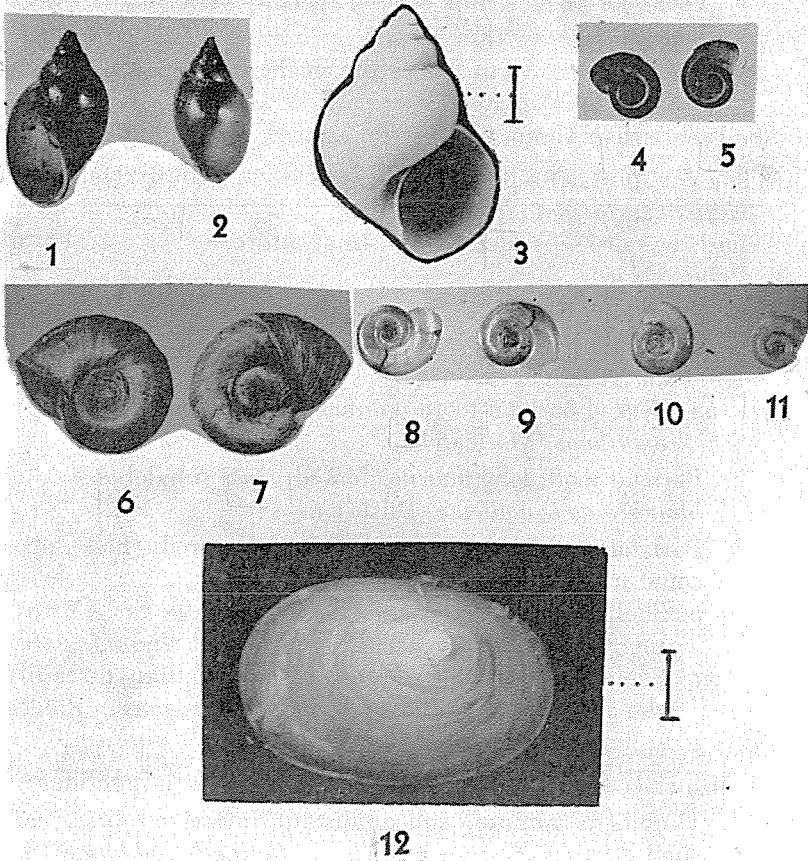


Fig. 7.

Family Physidae

Physa anatina, Nos. 1-2. x 2.

Family Amnicolidae

Amnicola integra, No. 3. x 8.

Family Planorbidae

Helisoma anceps, Nos. 4-5. x 1.

Helisoma trivolvis, Nos. 6-7. x 1.

Gyraulus parvus, Nos. 8-11. x 3.

Family Ancyliidae

Ferrissia rivularis, No. 12. x 10.

(Scale lines equal 1 mm.)

- B. Shell wider than high, spire flattened or dome-shapedC
- Shell higher than wideH
- C. Shell with lip thickened, reflected or turned backD
- Shell with thin lip, not thickenedF

- D. Shell less than 4 mm. in diameter.....Family Valloniidae
1. Diameter about 2 mm. or less; aperture very oblique.....*Vallonia parvula* Sterki
 2. Diameter 2.5-3 mm.; aperture moderately oblique.....*Vallonia gracilicosta* Reinhardt.
- Shell more than 4 mm. in diameterE
- E. Whorls or spire not separated by a sutureFamily Helicinidae
Helicina orbiculata tropica Pfeiffer
- Whorls or spire separated by a distinct suture.....Family Polygyridae
1. Shell provided with a forked parietal tootha.
 - a. Forked parietal tooth squarish in front view.....*Polygyra dorfeuilliana* Lea
 - aa. Forked parietal tooth pointed in front view.....*Polygyra texasiana* (Moricand)
 2. Parietal tooth long and not forked; shell subglobose.....*Stenotrema leai aliciae* (Pilsbry)
 3. Parietal tooth, when present, short or curved; shell globose-conic to lens-shapeda.
 - a. Shell moderately elevated; height usually three-fifths or more of the diameter.....*Mesodon thyroidus* (Say)
 - aa. Shell lens-shaped; height usually less than three-fifths the diameter*Polygyra roemeri* (Pfeiffer)
- F. Shell surface dull and coarsely ribbed.....G
- Shell surface smooth and polishedFamily Zonitidae
1. Umbilicus minute; subequidistant impressed lines across shell.....*Retinella indentata* (Say)
 2. Umbilicus well developeda.
 - a. Shell widely umbilicate; umbilicus about one-third diameter of shell; less than 4 mm. in diameter.....*Hawaiiia minuscula* (Binney)
 - aa. Umbilicus about one-fourth diameter of shell; weakly sculptured with growth wrinkles; 5-6 mm. in diameter....*Zonitoides arboreus* (Say)
- G. Shell with 3 distinct dark bands on basal whorl.....Family Helminthoglyptidae
Humboldtiana chisosensis Pilsbry
- Shell without 3 distinct bands on basal whorl.....Family Endodontidae

1. Shell large (15–25 mm.); with dark blotches over a neutral ground color *Anguispira alternata* (Say)
 2. Shell small (2–5 mm.) a
 - a. Surface sculptured with spaced spiral threads; teeth usually present in last whorl..... *Helicodiscus eigenmanni* Pilsbry
 - aa. Surface without spiral threads, smooth; no internal teeth *Helicodiscusingleyanus* (Pilsbry)
- H. Shell aperture occupying one-half or more length of shell.....I
 Shell aperture occupying not more than one-third length of shell..J
- I. Shell moderately heavy with tan, gray or grayish-white markings on shell.....Family Bulimulidae
 Shell large (24–40 mm.) and heavy..... a
 - a. Shell with a dark brown innerlining; columella frequently toothed..... *Bulimulus alternatus mariae* (Albers)
 - aa. Shell without dark innerlining; no columellar tooth..... *Bulimulus schiedeanus* (Pfeiffer)
 Shell smaller (17–23 mm.) and not so heavy; streaked or spotted with white against a grayish background..... *Bulimulus dealbatus* (Say). Shell thin, with white, yellow or amber surface (less than 15 mm.)..... Family Succineidae (very difficult to identify species without the soft parts)
- J. Aperture without folds or teeth of any kind.....K
 Aperture rounded with one or more folds or teeth.....L
 Aperture long and narrow; with a single tooth on parietal wall; about 2 mm. long Family Carychiidae
Carychium exiguum (Say)
- K. Shell brownish, yellow, and highly polished; shell more than one-half inch high
 1. Apex of shell blunt and closed with convex plug.....Family Achatinidae
Rumina decollata (Linnaeus)
 2. Apex of shell not blunt.....Family Oleachinidae
Euglandina texasiana (Pfeiffer)
 Shell, dull, grayish-white or brown; shell less than one-half inch high Family Pupillidae
Pupoides albilabris (C. B. Adams)
- L. Shell height more than 6 mm.....Family Urocoptidae
Holospira roemeri (Pfeiffer)
 Shell height less than 6 mm.....Family Pupillidae

1. Parietal teeth growing together and converging inward or completely united into one winding tooth.....a
 - a. Parietal wall and columella with one or two small teeth*Gastrocopta pentodon* (Say)
 - aa. Teeth of parietal wall strongly or moderately developed; aperture nearly filled with large teeth.....b
 - b. Shell 3.5–5 mm. long, oblong-shaped; angulo-parietal tooth not bent L-shaped....*Gastrocopta armifera* (Say)
 - bb. Shell approximately 2.5 mm. long, conic-ovate-shaped; angulo-parietal tooth bent L-shaped*Gastrocopta contracta* (Say)
 - aaa. Teeth much smaller and not crowding aperture.....b
 - b. Angulo-parietal tooth not branched but forms a strong winding crest*Gastrocopta cristata* (Pilsbry and Vanatta)
 - bb. Angulo-parietal tooth branched but strong crest absent c
 - c. Angulo-parietal tooth has distinct spur on right side; outer lip of peristome distinctly thickened.....*Gastrocopta procera* (Gould)
 - cc. Angulo-parietal tooth bilobed; outer lip of peristome not thickened*Gastrocopta pellucida hordeacella* (Pilsbry)
2. Parietal teeth separatea
 - a. Shell cylindrical with blunt ends; length 3–4 mm.....*Pupilla blandi* Morse (in this species the teeth may be absent)
 - aa. Shell ovate; less than 3 mm. high.....*Vertigo ovata* (Say)

*Key to the Fresh-Water Snails of Texas That
Occur Most Commonly in Archeological Sites*

- A. Shell with elevated spire which is cone-shaped, turreted or flattened at the apex; or shell non-spiral (limpet-like)B
 - Spire of shell not elevated; apex flattened or sunkenFamily Planorbidae
 1. Whorls carinated (keeled) above and below.....*Helisoma anceps* Menke

2. Whorls not carinated on both sidesa
 a. Shell over 10 mm. in diameter; upper whorl may show
 carination; shell roughened by coarse transverse striae.....
Helisoma trivolvis (Say)
 aa. Shell less than 6 mm. in diameter; shell smooth and body
 whorl rapidly enlarges*Gyraulus parvus* (Say)
- B. Shell limpet-like; no whorls.....Family Ancyliidae
Ferrissia rivularis (Say)
 Shell with elevated spireC
- C. Shell sinistrally spiraled (when shell is held with the spire end
 up and the opening toward you, the opening is on your left).....
 Family Physidae
Physa anatina Lea (The species of physids are so difficult to
 separate that we are including only the one very abundant
 species)
 Shell dextrally spiralled (opening on your right when held with
 spire up and opening toward you).....D
- D. Shell less than 6 mm. in length
 Shell thin; surface marked with heavy crowded growth lines.....
 Family Lymnaeidae
Lymnaea dalli Baker
 Shell heavy; surface comparatively smooth....Family Amnicolidae
Amnicola integra (Say)
 Shell more than 6 mm. in lengthFamily Lymnaeidae
1. Spire much shorter than the elongated aperture; shell very
 thin.....*Pseudosuccinea columella* (Say)
2. Spire as long or longer than aperture.....a
 a. Six whorls; body whorl very large (inflated)....*Lymnaea*
bulimoides techella Pilsbry and Ferriss
 aa. Less than six whorls.....b
 b. Whorls shouldered near suture; last whorl half the
 length of the entire shell; surface of shell with coarse
 growth lines.....*Lymnaea obrussa* Say
 bb. Whorls not shouldered; last whorl less than half the
 length of entire shell.....*Lymnaea humilis*
modicella (Say)

Acknowledgments

We are indebted to the Philadelphia Academy of Natural Sciences for permission to use the following illustrations which appeared in Dr.

Henry A. Pilsbry's various monographs published under the title, *Land Mollusca of North America (North of Mexico)*: Fig. 2, Nos. 9-10, 15, 18-25; Fig. 3, Nos. 1-10, 13-24; Fig. 4, Nos. 17-25; Fig. 5, Nos. 1-20.

Bibliography

- Boekelman, H. J.
 1935. Ethno- and Archo-conchological Notes on Four Middle American Shells. *Maya Research*, Vol. 2, No. 3, pp. 257-277.
- Cheatum, E. P.
 n. d. Unpublished monograph on: Land and Fresh-water Mollusca of Texas.
- Dalquest, Walter W.
 n. d. A Human Skull and Associated Fauna from Foard County, Texas. *Proceedings of the Kansas Academy of Science* (in press).
- Eiseley, Loren C.
 1937. Index Mollusca and Their Bearing on Certain Problems of Pre-history—A Critique. In: *Twenty-fifth Anniversary Studies of the Philadelphia Anthropological Society*, pp. 77-93. Publications of the Philadelphia Anthropological Society, Vol. 1.
- Goodrich, C.
 1932. The Mollusca of Michigan. *University Museum Handbook, Series 5*, University of Michigan.
- Hibbard, C. W.
 1949. Techniques of Collecting Microvertebrate Fossils. *Contributions from the Museum of Paleontology of the University of Michigan*, Vol. 8, pp. 7-19.
- Leonard, A. B.
 1959. *Handbook of Gastropods in Kansas*. University of Kansas Museum of Natural History, Miscellaneous Publication No. 20.
- Libby, W. F.
 1952. *Radiocarbon Dating*. University of Chicago Press.
- Pilsbry, H. A.
 1939-1948. *Land Mollusca of North America (North of Mexico)*. The Academy of Natural Sciences of Philadelphia, *Monographs*, Vol. 1, Part 1, pp. 1-573, 1939; Vol. 1, Part 2, pp. 575-594, 1940; Vol. 2, Part 1, pp. 1-520, 1946; Vol. 2, Part 2, pp. 521-1113, 1958.
- Taylor, Walter W.
 1957. *The Identification of Non-artifactual Archaeological Materials*. National Research Council Publication 563.
- Urey, H. C.
 1948. Oxygen Isotopes in Nature and in the Laboratory. *Science*, Vol. 108, No. 2810, pp. 489-496.

Southern Methodist University
 Dallas, Texas

An Evaluation of Radiocarbon Dates From the Galena Site, Southeastern Texas

E. RAYMOND RING, JR.

Introduction

The Galena shell midden is located on a knoll near the mouth of Hunting Bayou in the incorporated City of Galena Park some ten miles east of the central downtown Houston business district in Harris County, Texas. This interesting Galveston Bay Focus site came to public attention in the summer of 1957, unfortunately as the result of a Houston newspaper story. The excavation of the site, conducted principally in 1958, but in part during 1959, involved an out-of-the-ordinary salvage effort aimed at preserving its archeological record from the unintentional damage being done by persons whose curiosity had been aroused by the newspaper item.

While the preliminary archeological report of this site was prepared and presented in early 1959, two radiocarbon assays provided shortly thereafter by the Geochemical Laboratory, Exploration Department, Humble Oil and Refining Company (Houston, Texas), caused the investigator to withdraw and take a long, hard look at the puzzling aspects of the matter. The report which follows presents a tentative evaluation of the Galena shell midden radiocarbon dates, giving particular attention to the pottery associations. At a later date a complete report will be made of the Galena shell midden site. This will describe the cultural materials recovered and present a full archeological evaluation.

The Problem

The surprising antiquity shown by the radiocarbon assays of the Galena shell midden samples, and particularly the date obtained from sample O-912 (3350 ± 115 years B. P.), has created the necessity for conducting an exhaustive study of the time and space relationships and/or anomalies which have been found to exist in archeological cul-

tures extending broadly across the entire southern half of the United States. A two-year search of the literature provides a certain amount of intellectual peace-of-mind, however large or small the helping may be.

To review the Galena shell midden problem, a brief description of the total midden deposit is here presented. The superficial six-inch layer of the midden deposit consisted of a very dark, organic, sandy loam and throughout most of the vertical column were dispersed Goose Creek potsherds, flint dart points, and other cultural materials which, by archeological evaluation, fall into some phase of the Galveston Bay Focus. Of special note, this layer produced the one and only arrow-point (Perdiz type) found in the entire site excavation. Beneath this loam layer was found a foot-thick zone of compact shell, the interstices of which were filled with very dark, organic, sandy loam. It is this compact shell layer, also containing cultural materials attributable to some phase of the Galveston Bay Focus, that was subjected to the two radiocarbon assays. The foot-thick shell layer rested rather conformably on a reddish-brown, weathered, natural platform of the Beaumont Clay formation, the Quaternary mantle which blankets this area of the Texas Coastal plain outside of the margins of certain drainage features. In the early stage of excavation, this weathered Beaumont Clay platform surface appeared to be sterile of human artifacts; however, continued excavation produced six flint dart points and a flint knife, abundant natural calcareous concretions used as roasting stones, and some occasional traces of badly decomposed *Rangia* shell and animal bone fragments extending to the maximum depth of about six inches below the surface of the platform. It became apparent that this pre-ceramic layer represents a light occupation by men who wandered along Hunting Bayou prior to its backflooding stage, probably during the Archaic Stage of human time.

A sample of *Rangia* shell was collected from the top of the compact shell layer, and another was collected from the base. The upper sample (O-911) produced a radiocarbon date of 1900 ± 105 years B. P., while the lower sample (O-912) produced a radiocarbon date of 3350 ± 115 years B. P. Both samples were in direct contact with Goose Creek sand-tempered potsherds, a ware indigenous to this particular stretch of the Texas Gulf Coastal Plain, as well as dart points characteristic of the Galveston Bay Focus.

The Case for Early Pottery

Heretofore, and perhaps even now, there has been a decided reluctance among most archeological investigators to accept wholeheartedly

the suggestion that pottery, and particularly sand-tempered pottery, might have been used at such an early time in North America. If one were seeking from the literature mental reassurances to support the very early Galena midden site pottery radiocarbon dates, he could find certain solace in the results of radiocarbon determinations in two Southeast cultural sites, both of which date fiber-tempered pottery zones, as follows:

- (1) Chattahoochee River Site (J-5), Florida. Charcoal sample (M-394) in fiber-tempered pottery zone, collected and submitted by Ripley Bullen in 1958. Dating produced 3150 ± 250 years B. P. (Crane and Griffin, 1958: 1101).
- (2) Sapelo Island Site, McIntosh County, Georgia. Shell sample (M-39) in fiber-tempered pottery zone, collected and submitted by Antonio J. Waring in 1956. Average date of two samples produced 3700 ± 250 years B. P. (Crane, 1956: 665).

Although the Florida and Georgia dates argue the case for very early pottery in the American Gulf Coastal Plain, we must recognize that these two sites produced fiber-tempered pottery as contrasted to the Galena midden in Texas which produced sand-tempered pottery. Here we must search the literature again to determine whether temporal relationships have ever been found to exist between these two classes of pottery. And here again we receive a modest amount of intellectual security in the results of the investigations of William S. Webb and David L. DeJarnette (1948 a-d) at the great mussel shell middens along the Tennessee River in Northern Alabama. These sites are: the Flint River Site, the Perry Site, the Whitesburg Bridge Site, and the Little Bear Site. In these fabulously thick midden deposits one apparently reads the complete text of southeastern Woodland vessels, ranging from pre-ceramic to historic pottery types, written in the stratigraphic wall of time. Here one can also find a strong suggestion of contemporaneity between fiber-tempered and sand-tempered ceramics. In these massive mussel shell middens the earliest scriptures read of an admixture of preceramic sandstone and steatite vessels in such positioning as to be indistinguishable as to which preceded the other. These are followed temporally by occupation layers which contain both fiber-tempered and sand-tempered potsherds so thoroughly mixed that, again, one cannot be certain which antedates the other, if at all. Subsequently the clay- and sherd-tempered wares appear and these are followed by the shell-tempered wares, the latter of which apparently originated prehistorically but extended into early historic time.

Thus, if one wishes to argue in favor of the credibility of the very early Galena site Goose Creek sand-tempered pottery dates of 1900 ± 105 B.P. and 3350 ± 115 B.P., he can take certain comfort in the pottery data obtained in Florida, Georgia, and northern Alabama.

The Neighboring Pottery Complexes

To the east and northeast of the Houston area we observe the fairly well defined ceramic sequence of the lower Mississippi River Valley cultures. While the Plaquemine, the Coles Creek, the Troyville, and the Marksville ceramics do not pose any great problem, since there has always been the suggestion that these cultures post-date the early dart-point zone ceramic phase of the Galveston Bay Focus, we still have the problem of the Tchefuncte pottery (Ford and Quimby, 1945). And further up the Mississippi River Valley we have an even more startling problem in the pre-ceramic Poverty Point culture (Ford and Webb, 1956) which falls in the late Archaic stage yet produces a radiocarbon date later in time (the arithmetic average date of the type site samples is 2773 ± 140 B.P.) than the three radiocarbon assays of pottery cultures in Florida (3150 ± 250 B.P.), Georgia (3700 ± 250 B.P.), and Texas (3350 ± 115 B.P.). As for the Tchefuncte, Wheat (1953) encountered a hint of contemporaneity between Tchefuncte and some phase of the Galveston Bay Focus in his investigation of certain sites at Addicks, Texas, about 15 miles west of Houston and about 25 miles west of the Galena shell midden. In an Addicks site Wheat excavated five sherds of Tchefuncte stamped pottery representing a single vessel, and subsequently the present writer excavated from two other Addicks sites six sherds of Tammany Pinched wares of the Tchefuncte tradition, representing two vessels. These data permit a suggestion of temporal correlation between some phase of each of these two widely separated cultures; however, the prevailing belief has been that, despite an indicated overlap of the two cultures, the body of Tchefuncte time would pre-date substantially even the earlier regions of Galveston Bay Focus time. In this regard, the arithmetic average date of all intelligible Tchefuncte radiocarbon assays yields the approximate date of 1690 ± 140 B.P. The two radiocarbon tests which seem to best date the early Tchefuncte are O-28 (1900 ± 110 B.P.) and O-30 (2200 ± 110 B.P.) run on *Rangia* shell and deer antler, respectively (Brannon *et al.*, 1957: 148). These two dates are almost identical to the Galena Shell midden sample O-911 (1900 ± 105 B.P.) but much later than sample O-912 from the same site which produced 3350 ± 115 B.P.

As for the Poverty Point Site farther up the Mississippi River from the Tchefuncte culture in Louisiana, this interesting late Archaic site is regarded as pre-ceramic; however, it should be noted that a small collection of fiber-tempered pottery was recovered from the Poverty Point layer during excavations (Ford and Webb, 1956), and a few rare sherds are still being plowed up at the site today. While there is no particular evidence that the Poverty Point people manufactured fiber-tempered pottery, it would seem that they were acquainted with some far distant folk who did, and perhaps they obtained this fiber-tempered pottery from the people in the Southeast who provided them with steatite bowls.

To the north of the Houston area are the Caddoan pottery complexes which present no problem of themselves, since all known Caddoan phases seem to post-date the early phase of the Galveston Bay Focus; however, certain problems are posed in the areas of geographic overlap, namely at the George C. Davis Site, Cherokee County, Texas (Newell and Krieger, 1949) and the three McGee Bend Reservoir Sites, San Augustine County, Texas (Tunnell, 1961; C. H. Webb, 1960; and Edward B. Jelks, personal communications). Both inland areas show an interesting ceramic sequence, that is, of Caddoan pottery types underlain by an aberrant sand-tempered pottery quite similar in most respects to the Goose Creek ceramics of the coastal area. While no radiocarbon assay has been made of this cultural layer at the McGee Bend sites, the artifact suite compels Tunnell (1961) to suggest that this sand-tempered pottery horizon should be placed in the late Archaic stage. The Davis site produced a radiocarbon date of 1553 ± 175 B. P. from charred corn cob samples (C-153) from a culture identified as Phase 1 of the Alto Focus, Gibson Aspect (Neo-American Stage). It is interesting to observe that virtually all of the sand-tempered sherds found at the Davis site were recovered from the early Phase 1 level dated by the radiocarbon test. This remark is in no way intended to imply that sherds of the early Caddoan Alto Focus were absent from this layer because, in fact, they were overwhelmingly present. The Davis site dating is slightly later than the younger of the two Galena midden dates (1900 ± 105 B. P.); however, it is entirely conceivable that pottery moved from the Texas coast to northeastern Texas.

To the northwest of the Houston area the pottery complex of the Central Texas Aspect (Neo-American Stage), consisting of Leon and other unidentified types, presents no particular problem in connection with the Galena shell midden dates, but only because the Central

Texas types are very poorly understood and undated by radiocarbon. As a special note, sand-tempering is fairly common among some of these ill-defined Central Texas pottery types, despite remarks to the contrary by Suhm and associates (1954).

To the southwest of the Houston area there occurs along the Texas coast a peculiar sand-tempered or mixed-tempered pottery taking the name of Rockport, which is also the name of the focus within which this pottery is found. While the physical properties of the Rockport ceramics have been well described in the literature, there are no radiocarbon dates available for the Rockport Focus. Investigators place the Rockport Focus in the Neo-American Stage in which it probably belongs at least at inception; however, it has been shown that in at least one site, the Live Oak Point Site, Aransas County (Campbell, 1958), that Rockport pottery survived into historic time. Here it was found in position with European artifacts dating within the first quarter of the nineteenth century and indicating an identification with Karankawa Indians. The Rockport Focus and the earlier pre-ceramic Aransas Focus of the Archaic Stage which underlies it are found in an area geographically contiguous to the Galveston Bay Focus. It might be argued that, although no temporal correlation has yet been established between any cultural phases of the two areas, the terminal Rockport Focus time extending into the Historic Stage may cast reflections on the antiquity of the Galena midden radiocarbon dates. This does not, however, seem to be a valid assumption for more reasons than stated above. Even before the Galena midden radiocarbon dating, the culturally undivided Galveston Bay Focus had shown evidences of having embraced a long span of time commencing as early as some phase of Tchefuncte and surviving as late as A.D. 1600 or 1700. Today one notes the growing suspicion that the Goose Creek pottery of the Galveston Bay Focus extends into the European contact period in isolated sea-coast sites in the Galveston Bay region. It is perhaps only a matter of time until some undeniable associations of Goose Creek potsherds with European materials will be established.

Conclusions

If one reaches out to find evidence to support the antiquity of the Galena shell midden radiocarbon pottery dates, then he can find considerable reassurance in the radiocarbon dates from both the Florida and Georgia pottery sites, in the pottery sequences and associations demonstrated in the massive mussel shell middens of the Tennessee

River Valley in northern Alabama, and in the general ceramic relationships that are observed widely across the southern half of the United States. If one could accept these data and the suggested conclusions derived therefrom as being reasonable probabilities, then he might persuade himself to consider that North American pottery may have first been used in cultures along the Gulf Coastal Plain and later moved northward up the many great valleys which drain across it. The present data do not necessarily compel one to speculate that North American pottery originated in the American Gulf Coastal Plain cultures. Perhaps it did, but otherwise pottery manufacture may have had its beginning even further south than the American Gulf Coastal Plain, perhaps in the Huastecan culture on the Gulf Coastal plain of Mexico, or even further beyond in the Valley of Mexico.

Returning finally to the Galena shell midden radiocarbon dates and the problems that the antiquity of these dates reflect on previous archeological time concepts insofar as the Galveston Bay Focus and Goose Creek sand-tempered pottery are concerned, one is left with the disagreeable chore of choosing sides between the earlier concepts which have broadly placed Galveston Bay Focus sites in a time range extending from about A.D. 500 to about 1700, as contrasted with the Galena radiocarbon range of 1391 B.C. to A.D. 59. If one chooses to reject the present Galena radiocarbon dates, then he will argue that we must accept the highly intelligent speculations of past archeological investigators who did not have available radiocarbon assays to assist or confuse them in their dating conclusions. From the standpoint of simple arithmetic, the dating conclusions of earlier investigators considerably outnumber the present radiocarbon dates, and there is always the question as to whether we have the right to dispute the intensive archeological considerations of competent scientists with a mere radiocarbon date or two. Thus the problem boils down to a thick, viscous residue which can be seen clearly with the eye and judged by the mind. It is neither necessary nor preferable to choose sides. It is patently desirable to join forces (1) to promote further archeological investigations in this area of puzzling cultural complexes which we presently seem satisfied to tag by the name of "Galveston Bay Focus" and expect a wide range of cultural manifestations to equate comfortably into it, and (2) to press for a multitude of radiocarbon assays to study and evaluate in conjunction with archeological findings. Until such time as a mass of statistical radiocarbon data can be compiled and evaluated within the presently defined Galveston

Bay Focus, it would seem unwise to reject the time concepts of earlier investigators who based their decisions on numerous archeological considerations outside of radiocarbon assay. By the same token, it would seem extremely undesirable at this time to reject the newly discovered Galena shell midden radiocarbon pottery dates simply because they violate grossly all the previous archeological time concepts in the area of investigation.

References Cited

- Brannon, H. R., Jr., A. C. Daughtry, D. Perry, L. H. Simons, W. W. Whitaker, and Milton Williams
1957. Humble Oil Company Radiocarbon Dates. *Science*, Vol. 125, No. 3239, pp. 147-150.
- Bullen, Ripley P.
1958. Six Sites Near the Chattahoochee River in the Jim Woodruff Reservoir Area. *Bureau of American Ethnology, Bulletin* 169, pp. 315-357.
- Campbell, T. N.
1958. Archeological Remains from the Live Oak Point Site, Aransas County, Texas. *The Texas Journal of Science*, Vol. 10, No. 4, pp. 423-442.
- Crane, H. R.
1956. University of Michigan Radiocarbon Dates I. *Science*, Vol. 124, No. 3224, pp. 664-672.
- Crane, H. R., and James B. Griffin
1958. University of Michigan Radiocarbon Dates II. *Science*, Vol. 127, No. 3306, pp. 1098-1105.
- Ford, James A., and George I. Quimby, Jr.
1945. The Tchefuncte Culture, An Early Occupation in the Lower Mississippi Valley. *Memoirs of the Society for American Archaeology*, No. 2.
- Ford, James A., and Clarence H. Webb
1956. Poverty Point, A Late Archaic Site in Louisiana. *Anthropological Papers of the American Museum of Natural History*, Vol. 46, Pt. 1.
- Newell, H. Perry, and Alex D. Krieger
1949. The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology*, No. 5.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
1954. An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 25.
- Tunnell, Curtis D.
1961. Evidence of a Late Archaic Horizon at Three Sites in the McGee Bend Reservoir, San Augustine County, Texas. *Bulletin of the Texas Archeological Society*, Vol. 30 (for 1959), pp. 123-158.
- Webb, Clarence H.
1960. A Review of Northeast Texas Archeology. *Bulletin of the Texas Archeological Society*, Vol. 29 (for 1958), pp. 35-62.

Webb, Wm. S., and David L. DeJarnette

1948a. The Flint River Site. Alabama Museum of Natural History, Museum Paper 23.

1948b. The Whitesburg Site. Alabama Museum of Natural History, Museum Paper 24.

1948c. The Perry Site, Lauderdale County, Alabama. Alabama Museum of Natural History, Museum Paper 25.

1948d. Little Bear Creek Site, Colbert County, Alabama. Alabama Museum of Natural History, Museum Paper 26.

Wheat, Joe Ben

1953. The Addicks Dam Site. I. An Archeological Survey of the Addicks Dam Basin, Southeast Texas. Bureau of American Ethnology, Bulletin 154, pp. 143-252.

Houston, Texas

New Radiocarbon Dates From Texas

Two Radiocarbon Dates from the Central Brazos Valley

Aycock Shelter. This is a small rock shelter (Site No. 39D4-12) located on Kell Branch, a small tributary of the Leon River, some nine miles north of Belton in Bell County, Texas. The shelter contained shallow midden refuse and 32 human burials. It was excavated in 1935-36 and reported by Watt (1936), along with studies of the skeletal materials by Aynesworth (1936), Lux (1936), and Turner (1936).

Suhm (1960: 90) evaluates the Aycock Shelter as follows: "Both later Edwards Plateau Aspect and Central Texas Aspect (Toyah Focus only) represented. The bulk of the midden deposit, however, appears to belong to the Edwards Plateau Aspect. Only a few of the burials were associated with artifacts—projectile points in all cases. Some of the points were very likely the cause of death. The cultural affiliations of the burials are difficult to determine, but presumably represented individuals of both aspects."

The fill in the Aycock Shelter ranged from six inches at the rear of the shelter to 32 inches near the overhang. This fill consisted mainly of midden debris covered by an unbroken surface layer, 6 to 10 inches thick, composed of limestone flour derived from the ceiling of the shelter. There were no fire pits or similar features anywhere in the shelter. The charcoal consisted of small scattered fragments collected from depths of 12 to 18 inches in Square 35-40/5-10, an area containing several burials at depths ranging from eight to 28 inches below the surface.

In 1956 this charcoal sample was sent to the Magnolia Laboratories in Dallas and was designated as FRL No. RC-24. It was processed in 1957 and the report of the same year states: ". . . it did not contain enough carbon for a reliable date. We estimate its age to be more than 10,000 years."

Clark Site. This site (No. 39B9-25) consists of a thin midden zone buried in Brazos River alluvium five miles upstream from the northern city limits of Waco, McLennan County, Texas. The midden layer

is approximately 35 feet above the normal low-water level of the Brazos River, and is located on a small point of land lying between the Brazos and a small eastern tributary. When discovered, the midden was overlain by 26 inches of sand; but the surface at this locality had been leveled for construction purposes, so that the original thickness of the overlying sand stratum is unknown.

A rock-lined hearth lay near the base of the midden, which rested on a sterile gray sand. This hearth contained ashes, charcoal, and eight large bone fragments of the whitetail deer (*Dama virginianus*). In 1957 the charcoal (Sample FRL No. RC-23) was dated by the Magnolia Laboratories as 680 ± 150 years (A.D. 1277 ± 150).

This date throws light on the age of the Sanders Focus, for artifacts at the hearth level included potsherds of *Canton Incised* and *Sanders Engraved*, as well as a number of Alba type arrowpoints. Approximately 95% of the projectile points from the hearth level were of Alba type.

The recent excavation of this site was a project of the Central Texas Archeological Society and a detailed manuscript report is on file with the Society in Waco.

REFERENCES CITED

Aynesworth, K. H.

1936. Biographic Studies of Twenty-one Skulls of the Central Texas Indian. Bulletin of the Central Texas Archeological Society, No. 2, pp. 30-34.

Lux, Konrad

1936. A Detailed Report of the Teeth and Supporting Structures as Found in Crania from Aycock Shelter. Bulletin of the Central Texas Archeological Society, No. 2, pp. 39-42.

Suhm, Dee Ann

1960. A Review of Central Texas Archeology. In: Edward B. Jelks, E. Mott Davis, and Henry B. Sturgis (editors), A Review of Texas Archeology, Part 1, pp. 63-107. Bulletin of the Texas Archeological Society, Vol. 29 (for 1958).

Turner, Fred A.

1936. Chronic Arthritis in the Early American Indian in Central Texas. Bulletin of the Central Texas Archeological Society, No. 2, pp. 35-38.

Watt, Frank H.

1936. A Prehistoric Shelter Burial in Bell County, Texas. Bulletin of the Central Texas Archeological Society, No. 2, pp. 5-27.

Frank H. Watt
Waco, Texas

Two Radiocarbon Dates from the Galena Site of Southeastern Texas

The Galena site is a shell midden located near the mouth of Hunting Bayou, in Galena Park, some 10 miles east of the central downtown business district of Houston, Harris County, Texas. Excavation in 1958-59 indicated an occupation attributable to the Galveston Bay Focus. The stratigraphy at this site is as follows: an upper layer of dark sandy loam, six inches thick; a middle layer of compact shell in a matrix of dark sandy loam, 12 inches thick; and a lower layer of red-brown sandy clay, six inches thick, resting on a bed of sterile gray-brown clay. Two shell samples from the middle shell layer have been assayed by the Geochemical Laboratory, Exploration Department, Humble Oil and Refining Company, Houston, Texas.

Sample O-911. Shells of *Rangia cuneata* (a brackish-water clam), were collected (May, 1959) from the top of the middle layer of compact shell. These shells were in direct contact with Goose Creek potsherds, flint dart points, and other artifacts associated with an unidentified phase of the Galveston Bay Focus. The age determination reported (June 26, 1959) was: 1900 ± 105 years ago, or A.D. 59 ± 105 .

Sample O-912. Shells of *Rangia cuneata* were collected (May, 1959) from the basal part of the middle layer of compact shell, and these were also in contact with Goose Creek potsherds, flint dart points, and other artifacts associated with an unidentified phase of the Galveston Bay Focus. The age determination reported (June 26, 1959) was: 3550 ± 115 years, or 1391 ± 115 B.C.

An evaluation of these dates appears elsewhere in this issue of the *Bulletin*.

E. Raymond Ring, Jr.
Houston, Texas

A Radiocarbon Date from Central Texas

A sample of charcoal from the Crumley site, an Edwards Plateau Aspect site of Travis County, has been dated by the Geochemical Laboratory of the Humble Oil and Refining Company, Houston, Texas. This sample came from the transition zone between Stratum 1 and Stratum 2 and represents the initial phase of occupation at this site. Stratum 1 contained no artifacts other than those in the transition zone, and in Stratum 2 the dominant projectile point types were Bulverde, Nolan, and Travis. Pedernales points were numerous at this

site, but were concentrated in Stratum 4. Only three Pedernales points occurred in Stratum 2 (Stratum 3 was sterile), but 150 Pedernales points occurred in Stratum 4.

The age determination of this sample (O-1315) is 3275 ± 125 years or 1315 ± 125 B.C. This is the first radiocarbon date from a pure component of the Edwards Plateau culture, and it supports the contention that certain dart point types preceded others in the Edwards Plateau Aspect. The Crumley site is reported in this issue of the *Bulletin of the Texas Archeological Society* (Vol. 31, for 1960).

Col. Thomas C. Kelly
U. S. Air Force

A Radiocarbon Date from Goebel Midden, Austin County

Carbonized wood, including acorns, from a hearth in the lower part of this midden has been dated by the Shell Development Company, Houston, Texas, at 4530 ± 80 years, or 2569 ± 80 B.C. The Shell Development Company report, dated June 12, 1961, designates the sample by report Number 8205, Book Number 1173.

The Goebel Midden has thus far been excavated to a depth of 120 inches below the present surface. In the midden deposit scattered potsherds and arrowpoints were found down to a depth of approximately 36 inches below the surface. From this level downward occurred artifacts assignable to the Archaic Stage, some dart point types, such as Pedernales, indicating relationship with the Edwards Plateau Aspect of central Texas. The carbonized wood was collected from a hearth area containing thermally fractured sandstone situated at a depth of 106 to 108 inches. The sample provides the first radiocarbon date for the Archaic Stage of southeastern Texas.

Charles B. Fleming
Houston, Texas

E. H. Sellards, Geologist and Prehistorian, 1875–1961

Elias Howard Sellards, a distinguished scientist who called Texas his home for some 42 years, died in Austin on February 4, 1961, at the age of 85. Although his primary field was geology, his long and active interest in human prehistory, particularly the Paleo-Indian phase in North America, made him well known to archeologists everywhere. After 1940 most of his research and publication was in the field of archeology. He was a member of the Texas Archeological Society, and in 1959 the Society formally recognized his contributions by electing him a Fellow.

Dr. Sellards was born in Carter City, Kentucky, on May 2, 1875. When he was still a boy his family moved west in a covered wagon and settled near Scranton, Kansas. His college training was received at the University of Kansas, from which he graduated with a B.A. degree in 1899. He remained at Kansas for the M.A. degree (1900), and then moved on to Yale University, where he obtained the Ph.D. in geology in 1903. He taught for one year at Rutgers University in New Jersey, and then became Professor of Geology and Zoology at the University of Florida. In 1907 he left his Florida teaching post to become State Geologist of Florida, a position he held for eleven years. In 1918 he joined the staff of the Bureau of Economic Geology at The University of Texas, and he remained with the Bureau for the rest of his life, serving as Chief Geologist (1922–1925), Associate Director (1925–1932), Director (1932–1945), and Director Emeritus (1945–1961). Concurrently he held other positions, such as Professor of Geology at The University of Texas (1926–1945) and Director of the Texas Memorial Museum (1938–1957).

Despite a heavy load of teaching and administrative duties, and frequent calls to serve as a technical consultant, Dr. Sellards always found time to write. His publications in geology alone number well over 100, and in this field his most outstanding contribution was *The Geology of Texas* (1932, 1934), a two-volume work prepared with the assistance of W. S. Adkins, C. L. Baker, and F. B. Plummer. Dr. Sellards was a member of many geological societies, several of which he



served as president—Southwestern Geological Society (1924, 1931, 1932, 1935, 1936), American Association of Petroleum Geologists (1938), and Society of Economic Paleontologists and Mineralogists (1938). In 1943 he served as Vice President of the Geological Society of America.

Dr. Sellards' archeological career began in 1916 when he found and reported human skeletal remains associated with bones of extinct animals at Vero, Florida. At that time it was not commonly believed that

man came to America early enough to have hunted the big game animals of the Pleistocene. The Vero find led to much discussion and argument, and even today it is still controversial.

The greatest contributions of Dr. Sellards to American archeology came after he had moved to Texas and had become one of its most eminent geologists. In 1937, in association with Glen L. Evans, he began a series of investigations at Paleo-Indian sites that added substantially to knowledge of the earliest human occupations of this continent. Dr. Sellards' name is firmly linked with nearly all of the important Paleo-Indian sites in Texas and eastern New Mexico.

At Miami and at Blackwater Draw Dr. Sellards found Clovis points associated with the mammoth; and at Lubbock, as well as at Blackwater Draw, he found Folsom points in association with extinct bison bones. The stratigraphy at Blackwater Draw enabled him to show that Folsom points were later than Clovis points, and also that parallel-flaked points (Portales complex) were still later in time. This was the first Paleo-Indian culture sequence to be demonstrated in the southern Plains. Dr. Sellards found and described new types of Paleo-Indian points at Plainview and at Milnesand, and at Lubbock he obtained the first radiocarbon dates for the Folsom complex. When to this is added the results of his excavations at other Paleo-Indian sites, such as Berclair Terrace, Malakoff, Montell, Kincaid, and Midland, the record is impressive and enviable.

Dr. Sellards' major archeological publication was his book, *Early Man in America* (1952), which became a standard reference work and went out of print only a few years after publication. At the time of his death Dr. Sellards was hard at work preparing a second and revised edition of this book.

Dr. Sellards was much respected by those who were fortunate enough to know him. Industry, integrity, and kindness were his most notable personal traits. He will be remembered long, both as a man and as a scientist. He is survived by two daughters, Mrs. F. H. (Daphne) McGown and Mrs. H. A. (Helen) Hemphill, both of Houston, Texas, five grandchildren, eight great grandchildren, and one brother, E. W. Sellards of Topeka, Kansas.

The publications of Dr. Sellards in archeology are given below. Lists of his other publications are appearing in several geological journals.

1915. *Chlamytherium septentrionalis*, an Edentate from the Pleistocene of Florida. *American Journal of Science*, Fourth Series, Vol. 40, pp. 139-145. New Haven.

1916. Human Remains and Associated Fossils from the Pleistocene of Florida. Florida Geological Survey, 8th Annual Report, pp. 123-160. Tallahassee.
1916. Human Remains from the Pleistocene of Florida. *Science*, Vol. 44, No. 1139, pp. 615-617. Washington.
1916. On the Discovery of Fossil Human Remains in Florida in Association with Extinct Vertebrates. *American Journal of Science*, Vol. 42, No. 247, pp. 1-8. New Haven.
1917. Further Notes on Human Remains from Vero, Florida. *American Anthropologist*, Vol. 19, No. 2, pp. 239-251. Lancaster.
1917. Note on the Deposits Containing Human Remains and Artifacts at Vero, Florida. *Journal of Geology*, Vol. 25, pp. 659-660. Chicago.
1917. On the Association of Human Remains and Extinct Vertebrates at Vero, Florida. *Journal of Geology*, Vol. 25, pp. 4-24. Chicago.
1917. Review of the Evidence on which the Human Remains Found at Vero, Florida Are Referred to the Pleistocene. Florida Geological Survey, 9th Annual Report, pp. 69-84. Tallahassee.
1918. The Skull of a Pleistocene Tapir including Description of a New Species and a Note on the Associated Fauna and Flora. Florida Geological Survey, 10th Annual Report, pp. 57-70. Tallahassee.
1919. Literature Relating to Human Remains and Artifacts at Vero, Florida. *American Journal of Science*, Vol. 47, pp. 358-360. New Haven.
1923. The Santa Barbara Skull. *Science*, Vol. 58, No. 1513, p. 538. Washington.
1930. Ancient, Not Prehistoric, Relics Found. *Science News-Letter*, Vol. 18, No. 486, p. 77. Washington.
1930. Malakoff Image (abstract). *Bulletin of the Geological Society of America*, Vol. 41, p. 207. New York.
1932. Geologic Relations of Deposits Reported to Contain Artifacts at Frederick, Oklahoma. *Bulletin of the Geological Society of America*, Vol. 43, pp. 783-796. New York.
1935. Discovery at Round Rock, Texas. *Science News-Letter*, Vol. 27, p. 67. Washington.
1935. Stream-terrace Building Coincident with Human Occupancy in Central Texas (abstract). *Proceedings of the Geological Society of America for 1934*, p. 106. New York.
1936. Recent Studies of Early Man in the Southwestern Part of the United States. *American Naturalist*, Vol. 70, No. 729, pp. 361-369. Salem, Mass.
1937. The Vero Finds in the Light of Present Knowledge. In: George Grant MacCurdy (editor), *Early Man*, pp. 193-210. J. B. Lippincott Company. Philadelphia and New York.
1937. The Vero Finds in the Light of Present-day Knowledge (abstract). *Pan-American Geologist*, Vol. 67, No. 5, pp. 379-380. Des Moines.
1938. Artifacts Associated with Fossil Elephant. *Bulletin of the Geological Society of America*, Vol. 49, No. 7, pp. 999-1009. New York.
1938. Artifacts Associated with Fossil Elephant (abstract). *Proceedings of the Geological Society of America for 1937*, p. 112. New York.
1938. Problem of Early Man in America (abstract). *Bulletin of the Geological Society of America*, Vol. 49, No. 12, Pt. 2, p. 1899. New York.
1939. Artifacts Associated with Extinct Vertebrates in Bee County, Texas (abstract). *Bulletin of the Geological Society of America*, Vol. 50, No. 12, Pt. 2, pp. 1932-1933. New York.

1939. How Long Has Man Been in America? The Geological Society of America. New York. 5 pp. Script of a radio address delivered over Station WLB (University of Minnesota), December 28, 1939, as part of the 52nd Annual Meeting of The Geological Society of America, held in Minneapolis, Minnesota.
1940. A Prehistoric Stone Image. Texas Memorial Museum Informational Circular, No. 18. Austin.
1940. Artifacts Associated with Extinct Vertebrates in Texas (abstract). Pan-American Geologist, Vol. 73, No. 2, pp. 151-152. Des Moines.
1940. Early Man in America: Index to Localities, and Selected Bibliography. Bulletin of the Geological Society of America, Vol. 51, No. 3, pp. 373-431. New York.
1940. New Fossil Localities in Texas (abstract). Bulletin of the Geological Society of America, Vol. 51, No. 12, Pt. 2, pp. 1977-1978. New York.
1940. Pleistocene Artifacts and Associated Fossils from Bee County, Texas (with Notes on Artifacts, by T. N. Campbell, and Notes on Terrace Deposits, by Glen L. Evans). Bulletin of the Geological Society of America, Vol. 51, No. 11, pp. 1627-1657. New York.
1940. Pleistocene Stone Images from Texas (abstract). Bulletin of the Geological Society of America, Vol. 51, No. 12, Pt. 2, p. 1944. New York.
1940. (with W. N. McNulty). The Great Wolf of the Texas Pleistocene. Texas Memorial Museum Information Circular, No. 11. Austin.
1941. Stone Images from Henderson County, Texas. American Antiquity, Vol. 7, No. 1, pp. 29-38. Menasha.
1941. Terrace Deposits as an Aid to Age Determination of Early Man (abstract). Bulletin of the Geological Society of America, Vol. 52, No. 12, Pt. 2, pp. 2007-2008. New York.
1944. Ancient Carvings. In: Views in the Texas Memorial Museum. Museum Notes, No. 6, pp. 23-29. Austin.
1945. Fossil Bison and Associated Artifacts from Texas (abstract). Bulletin of the Geological Society of America, Vol. 56, No. 12, Pt. 2, pp. 1196-1197. New York.
1946. The Plainview, Texas, Fossil Bison Quarry. Science, Vol. 103, No. 2681, p. 632.
1947. Early Man in America: Index to Localities, and Selected Bibliography, 1940-1945. Bulletin of the Geological Society of America, Vol. 58, No. 10, pp. 955-978. New York.
1947. (with Glen L. Evans and Grayson E. Meade) Fossil Bison and Associated Artifacts from Plainview, Texas. With Description of Artifacts by Alex D. Krieger. Bulletin of the Geological Society of America, Vol. 58, No. 10, pp. 927-954. New York.
1950. Clear Fork Points. Bulletin of the Texas Archeological and Paleontological Society, Vol. 21, pp. 110-111. Lubbock.
1950. Geological Section and Succession of Human Cultures in the Late Pleistocene of the Clovis-Portales Region, Eastern New Mexico (abstract). Bulletin of the Geological Society of America, Vol. 61, No. 12, Pt. 2, pp. 1501-1502. New York.
1952. Age of Folsom Man. Science, Vol. 115, No. 2978, p. 98. Washington.
1952. Early Man in America: A Study in Prehistory. University of Texas Press. Austin.

1955. Fossil Bison and Associated Artifacts from Milnesand, New Mexico. *American Antiquity*, Vol. 20, No. 4, pp. 336-344. Salt Lake City.
1955. Further Investigations at the Scharbauer Site. In: Fred Wendorf, Alex D. Krieger, Claude C. Albritton, and T. D. Stewart, *The Midland Discovery: A Report on the Pleistocene Human Remains from Midland, Texas*, Appendix 7, pp. 126-132. University of Texas Press. Austin.
1960. Some Early Stone Artifact Developments in North America. *Southwestern Journal of Anthropology*, Vol. 16, No. 2, pp. 160-173. Albuquerque.
1960. (with Glen L. Evans) The Paleo-Indian Culture Succession in the Central High Plains of Texas and New Mexico. In: Anthony F. C. Wallace (editor), *Selected Papers of the Fifth International Congress of Anthropological and Ethnological Sciences*, Philadelphia, September 1-9, 1956, pp. 639-647. University of Pennsylvania Press. Philadelphia.

T. N. Campbell
The University of Texas

Book Reviews

The Harroun Site: A Fulton Aspect Component of the Caddoan Area, Upshur County, Texas, by Edward B. Jelks and Curtis D. Tunnell. Archaeology Series, No. 2, Department of Anthropology, The University of Texas, Austin, 1959. 63 pp., 14 figs., 1 table. \$1.00.

This is a well-written, concisely structured and adequately illustrated publication which should be of value to all who are interested in Texas or Caddoan archeology. The Harroun site, consisting of four small mounds on the floodplain of Cypress Creek in Upshur County, was excavated in 1957-59 by the National Park Service-The University of Texas field parties as part of the Ferrell's Bridge Reservoir Archeological Salvage Project.

Details of excavation are preceded by a brief foreword, letters of transmission and acceptance, table of contents, list of tables and figures, an introduction which describes the chronology of exploration and three seasons of excavation, and the site environment, description, and geology. These are presented with brevity and precision.

The four mounds were crescentically arranged around a bend of the present stream and a relict channel. They varied from 30 to 50 feet in diameter and 2 to 3.5 feet in height. Exploratory trenches near three of the mounds did not reveal a village midden but did yield sparse evidence of pre-mound occupation as deep as four feet below the floodplain surface, insufficient to more than suggest a pre-mound Archaic occupation.

The internal structure of the four mounds was investigated in some detail. Mound A covered a single extended burial of an adolescent male, the only burial found, with burial offerings of a pottery bowl and a bottle, both Ripley Engraved type, and a Perdiz arrow point. Mounds B and D covered the burned ruins of single house structures, while Mound C had been heaped over the remains of two houses, a smaller superimposed over the covered ruins of a larger and earlier one. The authors concluded, as this reviewer had of the burned structures in the Belcher Mound, that these were temples, intentionally burned and ceremonially covered with a mound of earth.

The Harroun houses were circular with extended entranceways which projected west in three instances, southeast in the fourth. Three had been built on the original surface, one in a shallow excavated pit; posts for the outer circle were spaced about two feet apart and averaged one-half foot in diameter. There were central fire hearths, and beneath three (possibly all) of the hearths were molds of posts probably used in construction and removed. Two houses had interior roof supports, two lacked them; the authors' inference that these people may have made either "beehive" or wattle-and-daub houses with thatched roofs seems well taken. In all of these architectural features the Harroun houses bear strong similarities to Belcher houses, except for smaller size and interior features. Moreover, there are similar evidences at the two sites against earth lodges.

The ceramics study is based on the two burial vessels and 562 sherds. The section on ceramics and other artifacts is competently handled and well illustrated, except that profiles of rim sherds would have been helpful for comparative studies. Tempering is sherd, grit, and bone; shell is lacking, as is usual in East Texas. The variety of vessel forms is limited in comparison with more sophisticated ceramics of larger ceremonial centers of the Fulton period. Techniques include incising, engraving, punctating, brushing, and appliquéing; polishing and red filming occur.

Recognized types of pottery are Ripley Engraved, Taylor Engraved, Bullard Brushed, and Maydelle Incised, which are indigenous to Titus Focus; Pease Brushed-Incised, which is found widely in Louisiana and Arkansas in Haley (Gibson Aspect) and Bossier (Fulton Aspect) ceramics; one sherd each of Beldeau Incised and possible Coles Creek Incised attributed to the Coles Creek period of central Louisiana; and five Alto Focus sherds. One of the Alto Focus sherds is Crockett Curvilinear Incised, the other four probably Hickory Engraved.

The four sherds showing random paired nail punctations (Fig. 14, I) are almost certainly Alto sherds, and of the type which we have designated Wilkinson Punctated in Louisiana Alto sites. This reviewer questions the type Coles Creek (or Chase) Incised for the sherd in Fig. 13, H, because of the red filming which is absent from these types in Coles Creek ceramics. Presumably as a result of exchange of traits with Coles Creek people, vessels occur in Alto pottery (especially at the Davis site) which have the traits of incurving rim, flattened lip and incised or *engraved* line atop the lip, but otherwise having Cad-doan characteristics. Newell and Krieger describe and illustrate these in the Davis report, and we have found them in northern Louisiana

and Arkansas. It is not too surprising to find Alto and Coles Creek sherds in small numbers in a site like Harroun which otherwise has Fulton ceramics; this finding, along with Pease type, suggests Titus Focus assignment for the site.

Stone artifacts included 19 dart points, six arrow points, two bifacial blades, a drill, milling stones, grooved stones, and pitted stones. It seems worth while to reiterate the observation that much of the lithic inventory of pottery-making peoples in the Caddoan area is carried over from the Archaic styles, except for the arrow projectile points and certain ceremonial objects (blades, long and spatulate celts, effigy stone pipes, etc.). Late Archaic projectile point types like Gary, Wells, Ellis, Yarbrough, Trinity, Palmillas, and Bulverde are therefore not unexpected in this site. They are rare in burials of either Gibson or Fulton periods. The appearance of a San Patrice point at this site emphasizes our contention, even if it derives from the pre-mound and pre-ceramic Archaic occupation, that this type lasted to late Archaic and possibly to early pottery times.

This is a very worthwhile report, adding to our knowledge of East Texas archeology; similar excavations of small sites will round out conceptions which heretofore have been derived mainly from larger centers or cemeteries.

Clarence H. Webb
Shreveport, Louisiana

The Jake Martin Site: An Archaic Site in the Ferrell's Bridge Reservoir Area, Northeastern Texas, by William A. Davis and E. Mott Davis. Archaeology Series, No. 3, Department of Anthropology, The University of Texas, Austin, 1960. x + 63 pp., 10 figs. (1 map), 1 table. \$1.00.

This is a short but attractive publication, adeptly written, and important because this is the first Archaic site to be excavated in the immediate four-state corner area. The Jake Martin site was excavated in 1958 by a University of Texas-National Park Service archeological field party, as part of the Ferrell's Bridge Reservoir studies.

Brief preliminary descriptions of the geography, history, and archeological studies of the area are presented. Previous excavations demonstrated pottery-producing cultures identified with or related to the Titus Focus, a protohistoric Caddoan complex.

This site is an occupation area about 100 feet in diameter on an upland spur overlooking Cypress Creek valley in Upshur County.

Using standard techniques of excavation, approximately 1250 square feet were dug by 0.5 foot levels to undisturbed clay. No structural features were found, and the three described zones are natural soil formations. Artifacts were distributed through the surface humus (disturbed in some places), the 0.5 to 1.3 feet of underlying sand, and the top 1 to 3 inches of basal clay. Except for three pottery sherds, several Elam (arrow points?) points, and a hammerstone, all found in disturbed surface areas and attributed by the authors to later cultures represented at nearby sites, it is believed that the artifact traits constitute a single archeological complex. This reviewer prefers to accept this interpretation, rather than the alternate hypothesis offered by Jelks, that the site was occupied intermittently by a number of Archaic and possibly Paleo-American groups.

There were 424 stone artifacts and 46 fragments of hematite and limonite. No charcoal, bone, or shell was found. The lithic complex consists of projectile points (darts) and projectile point fragments, small core choppers, knives, scrapers, drills, and pointed bifacials, along with crude pitted and grinding stones.

Slightly more than half of the artifacts were projectile points and fragments; of these 26% were of Yarbrough type. Many projectile point types were in evidence—a total of 22 types for the 141 classified points. After the Yarbrough points in frequency were Gary (6%), Form 3 or Edgewood-like (4%), Wells (3.5%), Travis (3%), Ellis (2.6%), and Castroville or Castroville-Williams (2%). Other types are represented by four or less specimens for each type. Except for two of Carrollton type, and seven of presumed Paleo types, all are in categories found in late Archaic sites in the area. The variety of materials from which the projectile points were made is interesting. Flint, chert, quartzite, petrified wood, chalcedony, novaculite, and jasper are mentioned. This, as well as the variety of types, is typical of the Archaic period in East Texas and North Louisiana.

The relatively small size of Gary points and the blade-stem proportions are similar to findings on Archaic and pottery sites in northwestern Louisiana. At Poverty Point in northeastern Louisiana larger sizes prevail. Many sites in northwestern Louisiana have Gary points (Gary Small) which are 2 to 2.5 cm. in length.

The presence of Meserve and San Patrice points in this typically late Archaic assemblage at the Jake Martin site should evoke neither surprise nor an alternate hypothesis of Paleo-American occupation for the site. Although the authors are quite correct in stating that certain features of these points—concave bases, edge grinding, longitudinal

flaking from the base, and parallel to concave basal edges—are traits associated with points of the Paleo-American stage, the descriptions of these types in the *Handbook* and in my original description of the San Patrice type pointed out their regular occurrence in Archaic and sometimes pottery sites. San Patrice points have been found in excavations of two mounds of the Bellevue Focus, a ceramic period contemporaneous with Marksville in central Louisiana. A respectable antiquity for San Patrice points is indicated by a recent communication from R. K. Harris of Dallas describing the finding of two San Patrice points in a Carrollton Focus site and giving a radiocarbon dating of 5945 ± 200 B.P. for this focus. It seems clearly indicated that the Meserve and San Patrice types carry over certain Paleo-American traits of manufacture to a relatively recent time in this part of the United States.

A recently discovered Archaic site in Caddo Parish, Louisiana, yielded 88 projectile points, 54 of which were Gary and Ellis types. There were 10 typical San Patrice points, compared with six Carrollton and five Yarbrough types. Nearly every Archaic site in northwestern Louisiana has San Patrice points, and many have Meserve points; the same situation prevails in East Texas, except that the Meserve type becomes more frequent and the San Patrice type less frequent than in Louisiana.

One of the authors (E. M. D.) has called my attention to the fact that the name Red River Aspect has already been assigned to an assemblage in Minnesota, hence cannot be used for the Archaic assemblage in this area. We suggest adoption of the term "Shreveport Aspect" instead of "Red River Aspect" or "East Texas Aspect," which Suhm *et al.* have used.

Clarence H. Webb
Shreveport, Louisiana

Abstracts of New World Archaeology, Volume 1. Society for American Archaeology. University of Utah Press, Salt Lake City, 1961. 127 pp. \$3.50.

This publication, edited by Richard B. Woodbury, marks a significantly new venture undertaken by the Society for American Archaeology. It contains a total of 676 summary accounts or abstracts of publications dealing with the archaeology of North and South America. For the most part, the abstracts are for papers published in the year 1959 although a few items from earlier years are included. It is anticipated that additional volumes will follow for successive years, and

that, by way of these abstracts, one can better keep abreast of the increasingly voluminous archeological literature. The idea is certainly a sound one and has been practised by some other scientific fields for a number of years. This valuable contribution is perhaps a mark of maturity for archeology; certainly it is an indication of progress, and I wish to extend my wholehearted desire for success and continued existence.

The abstracts have been assembled by a staff of some 16 assistant editors along with the help of numerous collaborators—all selected because of their familiarity with certain regional areas. Many of the abstracts have been specially prepared for this volume, while others have been taken directly from the abstracts already available in the original publications. The practise of including an abstract along with an article is a very recent addition to archeological literature, and a few of our journals have initiated this policy. It is a policy, however, which should be more widely adopted.

The 676 abstracts in this volume include books, theses, microcards, and articles published in various journals. Each abstract includes the author's name, title, name of publication, date, and information necessary to locate the original article. This is followed by a summary statement as to the content and, occasionally, by a brief editorial comment. The abstract is intended to tell what the article or book is about, not to replace a "book review" or to evaluate the report.

The information has been arranged into some 28 categories, the first being "General" interest items, and the others being based upon geographical areas, such as the "Arctic," "Northern Mississippi Valley," and "Brazil." A few abstracts are cross-listed by notes which refer to other references on the same subject. Within each area, the abstracts are listed alphabetically in chronological order; for example, there are 36 abstracts, numbered 434 to 469 which are concerned with "Highland Mexico."

Abstracts dealing with the archeology of Texas and Oklahoma fall under two categories, the "North American Plains" and "Southeastern United States." The references to the 1959 publications for Texas and Oklahoma are a big disappointment. For Texas prehistory only two abstracts are presented: Wendorf and Krieger's *New Light on the Midland Discovery* published in *American Antiquity*, and C. H. Webb's *The Belcher Mound* published as *Memoir 16* by the Society for American Archaeology. Oklahoma fares slightly better by a total of five abstracts in the "Southeastern United States" section. This poor representation is partly a reflection of the fact that the *Bulletins* of the

Texas Archaeological Society and the Oklahoma Anthropological Society were not included in the journals utilized. This weakness or uneven coverage of existing journals is one of which the Editor, Richard Woodbury, is fully aware, and he has committed himself to additions for the 1960 volume. To avoid this in the future, we should take it upon ourselves to see to it that abstracts are supplied to the Editor or Assistant Editor for our respective regions. This will not only help to avoid omissions such as those above, but it will aid the Editor enormously in assembling the annual abstracts.

The volume is completed by an index of authors and the abstract number of their respective publications. This is useful for locating the writings of a specific person but does not help to identify subject matter.

In considering the volume as a whole, I think it will prove to be extremely useful not only to keep better informed, but as a bibliographic asset as well. In considering individual abstracts, I find much variation in length and usefulness. Some abstracts, even though reporting upon a two or three page article, are as long or longer than others reporting upon a lengthy monograph or book. The general unevenness of the various abstracts presented is also recognized by the Editor, and some efforts will probably be made for improvement. When so many different persons contribute to the final product, the first results are likely to be somewhat experimental, and I am sure we can look forward to gradual improvement.

One recommendation for an additional improvement that I would like to make is that a listing of journals or serial publications utilized for the abstracts be included. Such a listing would enable one to check specific journals quickly without hunting through the various individual abstracts.

I would also like to congratulate the Charles F. Brush Foundation and the Society for American Archaeology for developing this Abstract series and for bringing it to fruition.

Robert E. Bell
University of Oklahoma

Ethnographic Bibliography of North America, by George Peter Murdock. Human Relations Area Files, Behavior Science Bibliographies, 3rd edition, revised. New Haven, 1960. xxiii + 393 pp., double-column; 16 maps; paper covered. \$6.75.

This volume, the third edition of a well-known work, should be on

the reference shelf of every serious student of the American Indian. Members of the Texas Archeological Society, particularly those interested in historic site archeology, will find it useful for locating basic references on the Indian groups of Texas and adjoining areas. Archeological references are included, when pertinent, but these have been kept to a minimum.

The references are organized under 15 culture areas—Arctic Coast, Mackenzie-Yukon, Northwest Coast, Oregon Seaboard, California, Peninsula (southern California plus Baja California), Basin, Plateau, Plains, Midwest, Eastern Canada, Northeast, Southeast, Gulf, and Southwest. Within this framework the entries are classified under 253 tribal or band-cluster names. As in the preceding editions, each culture area section is prefaced by a list of general references, and an appendix presents a list (22 pages in the third edition) of general references to North America as a whole.

Mexico and Central America are not covered in this bibliography, rendering the title of the volume somewhat inaccurate. For these areas one must still consult Manuel German Parra and Wigberto Jimenez Moreno, *Bibliografía Indigenista de Mexico y Centroamerica* (Memorias del Instituto Nacional Indigenista, Tomo 4, 1954). Furthermore, only published sources are listed, so that for unpublished theses and dissertations one must still use Frederick J. Dockstader, *The American Indian in Graduate Studies* (Contributions from the Museum of the American Indian, Heye Foundation, No. 15, 1957).

Most of the references to Texas tribes are presented under three culture areas—Gulf, Plains, and Southwest. Nearly 500 classified references are given for the Indian groups who occupied Texas, or parts of it, for any lengthy period of time after A.D. 1500. Included are Caddo (71 references); the Wichita groups, including Kichai, Tawakoni, Waco, and Ysani (44); Tonkawa (27); Atakapa and related groups (20); Karankawa (21); Coahuiltecan (15); Lipan Apache (30) and Mescalero Apache (49); Jumano (12); Kiowa and Kiowa Apache (79); and Comanche (89). For the Alabama and Koasati, some of whom migrated to Texas in the early nineteenth century and who are now the only resident Indians of Texas, there are 24 titles. Numerous other Indian groups, all victims of the advancing frontier in the eastern United States, were briefly represented in Texas at various times during the nineteenth century. These groups, such as Biloxi, Cherokee, Choctaw, Kickapoo, and Seminole, to name but a few, are all well covered in Murdock's bibliography.

The third edition is much improved and covers publications through

early 1960. The first edition (1941) carried about 9,400 titles, the second (1953) some 12,700 titles, but the third edition has grown to approximately 17,300 entries. A new feature of the third edition is the addition of a full-page map of each culture area. These maps show tribal locations during the period of first extensive contact with Europeans. The larger type size, along with better spacing between words and lines, makes the third edition much easier to read and use. The addition of an alphabetized index of tribes is also helpful.

It is hoped that Murdock will continue to revise and expand this bibliography, whose usefulness has been amply demonstrated during the past two decades. Extension of coverage to Mexico and Central America is especially desirable.

T. N. Campbell
The University of Texas

