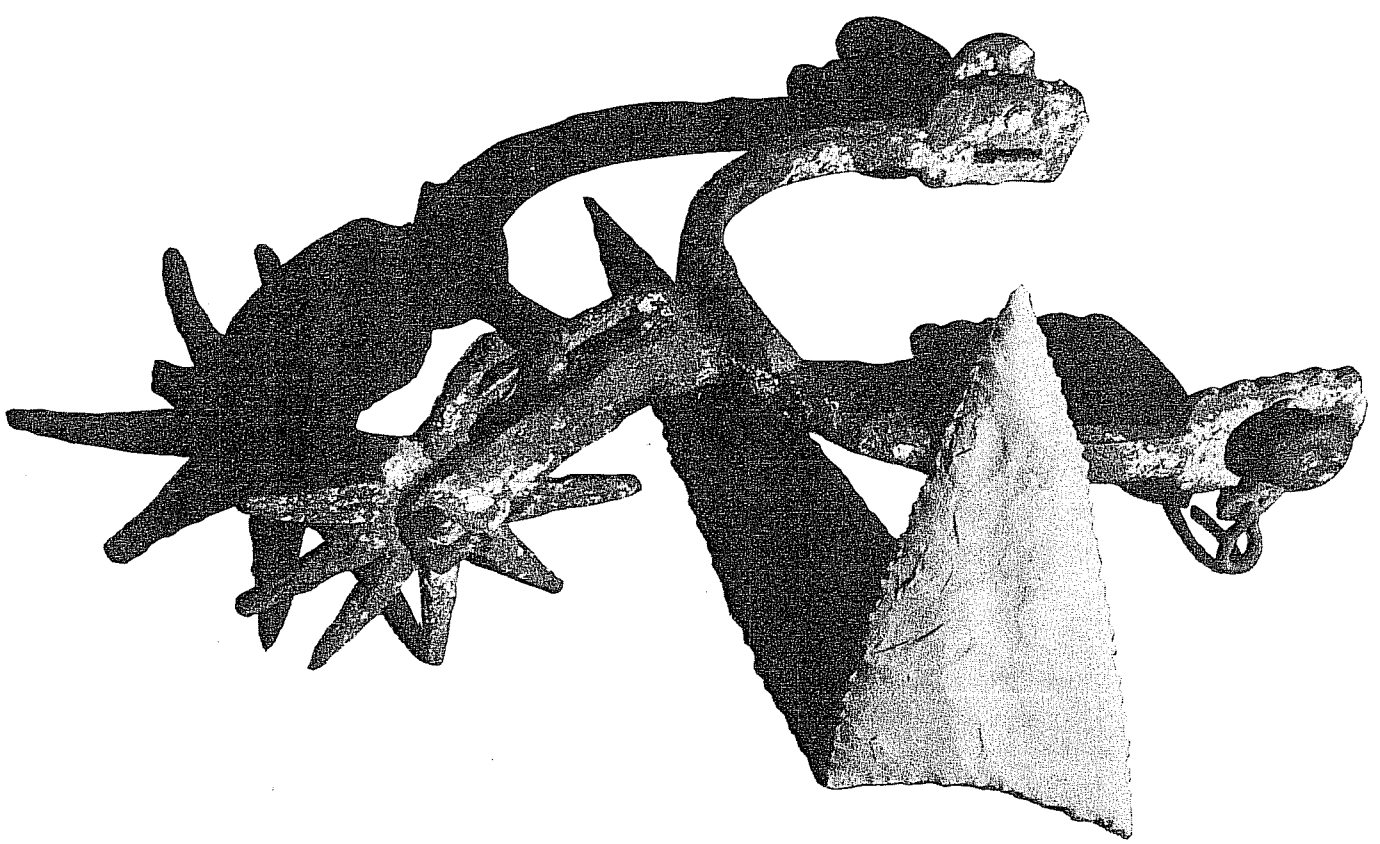
ARCHAEOLOGICAL INVESTIGATIONS AT 41 LK 201, CHOKE CANYON RESERVOIR, SOUTHERN TEXAS

Cheryl Lynn Highley

With Contributions By
Gary B. DeMarcay and D. Gentry Steele



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Thomas R. Hester, Director

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FOREWORD

> The prehistoric archaeologist . . . is essentially dealing with anonymous peoples. The settlement site he excavates he can date fairly precisely. . . . He has his site and the other similar sites, fixed in time, and he knows the geographical boundaries of the traditions and material equipment that they represent. But he cannot give a name to the authors of this common way of life. . . .
>
> Stuart Piggot
> **Approach to Archaeology,** 1959

In this volume, Lynn Highley details the archaeological record excavated at site 41 LK 201 in the Choke Canyon Reservoir basin. This site, in some ways, parallels the history of the Choke Canyon Project conducted by The University of Texas at San Antonio (UTSA). Further, the research orientation and the materials recovered from the site address many of the archaeological problems detailed in the project's research design prepared before any field work got underway. The site was found and tested during Phase I, a period of investigations that was aimed at completing the inventory of sites within the project area, as well as evaluating sites preparatory to mitigation recommendations for Phase II. During Phase II, a sizable block was excavated at 41 LK 201. Among the results of that excavation was the recognition that a concentrated and distinctive Late Prehistoric occupation was present just below the site's surface. In summer 1981, I directed a field school from UTSA in excavations at the site. We wanted to open a substantial area, plot materials and clusters of materials in place, and seek to better understand the Late Prehistoric component before the site was inundated. The previous research at the site pointed to the potential of the area that we chose to excavate. Our expectations were met in nearly every instance: Late Prehistoric fauna, tools, features, activity loci, and other sorts of data were exposed. We had hoped, in line with the Choke Canyon research design, to be able to isolate specific patterns of activity or behavior through such open-area excavations. The five-week field school program set limits, of course, as to the size of the area excavated; perhaps with additional excavations such patterns would have been evident. On the other hand, it may not have been. These materials are located just below the surface and could have been eroded and covered again a number of times in the last several hundred years. Or perhaps the clues to patterning would have been provided by perishable materials, such as hides, artifacts of wood, basketry, textiles, plant residues, etc., none of which are preserved in these deposits. Thus, we still cannot say what percentage of a Late Prehistoric component (even one with abundant cultural remains as at 41 LK 201) has to be excavated in order to look at spatial arrangements or intrasite patterns. Indeed, our efforts along these lines elsewhere at Choke Canyon have met with similar results. The answer may lie in the way the prehistoric peoples used these living areas. Were campsite activities neatly structured and focused within a certain area, or were they distributed in a linear fashion along the edges of the watercourse? Settlement data indicate that the refuse left by

repeated occupations within these favored camping areas might be better attributed to habitation "zones" rather than "sites!" There was little overlapping or superimposition of later camping residues over earlier ones. This phenomenon makes difficult, we know, attempts at chronology-building in south Texas sites, and, I suspect, it also will continue to challenge us in terms of elucidating intrasite patterning.

Finally, I would point to a site outside the Choke Canyon area as being important to understanding the evidence from 41 LK 201. That site is 41 JW 8, excavated by UTSA, in Jim Wells County about 50 miles to the south. Stephen L. Black has recently completed a comprehensive report on that Late Prehistoric site. It shares a number of similarities with 41 LK 201, as Highley points out, and both sites appear to represent a late phase in the regional Late Prehistoric.

Mr. Black has included 41 JW 8 and 41 LK 201 as two of several south Texas sites that he places into the "Toyah horizon." As in the quote from Stuart Piggot at the beginning of this Foreword, this cultural unit consists of "sites fixed in time . . . geographical boundaries and material equipment." But, as Piggot notes, we cannot, in this case ". . . give a name to the authors . . ." of the Toyah horizon. Do they represent indigenous southern Texas peoples who adopted the technologies of the Toyah horizon or are they groups from central Texas who have extended their range onto the coastal plain during this time span? These and other questions remain to be answered. The data from 41 LK 201 at Choke Canyon will continue to be a source of information in the study of southern Texas Late Prehistoric sites for many years to come.

Thomas R. Hester
October 18, 1985

ABSTRACT

Two phases of archaeological investigations were carried out by the Center for Archaeological Research, The University of Texas at San Antonio, in the Choke Canyon Reservoir region in south Texas. Sponsored by the U.S. Bureau of Reclamation, the investigations were necessitated by the impending dam construction and subsequent filling of the reservoir. During Phase I, numerous prehistoric sites were recorded and tested. As a result, several sites were recommended for additional excavations during Phase II.

Site 41 LK 201 was selected for intensive investigations because it contained both Archaic and Late Prehistoric cultural remains, was well stratified, and contained preserved charcoal and faunal samples throughout the occupational zones. Phase II excavations were designed to expose the stratified components both horizontally and vertically. The Archaic deposits included a series of burned rock features which provided wood charcoal suitable for radiocarbon dating. Radiocarbon dates for Middle and Late Archaic deposits ranged from 1300 B.C. (derived from Phase I excavations) to 480 B.C. Diagnostic artifacts were limited to a few dart points and gougelike tools.

The upper levels contained an extensive late phase Late Prehistoric occupational zone that produced **Perdiz** arrow points, end scrapers, bone-tempered pottery, and other types of midden debris. The extensive, concentrated nature of the Late Prehistoric zone warranted additional investigations. A UTSA Field School carried out extensive excavations that were primarily restricted to the upper 20 cm of deposits. Numerous **Perdiz** points, beveled knives, end scrapers, perforators or drills, bone and shell artifacts, and the largest ceramic sample from a single site in the reservoir region were recovered. Faunal remains recovered were marine shells, land snails, and a wide array of identifiable animal bone, including bison. Two radiocarbon dates, A.D. 1470-1500 and A.D. 1510-1590, were derived from these levels.

Key Words: archaeology, south Texas, Middle Archaic, Late Archaic, Late Prehistoric

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INTRODUCTION

Site 41 LK 201 is located in Live Oak County, Texas, approximately 0.48 km (0.3 miles) south of the Frio River (Fig. 1; also see Hall, Hester, and Black 1986:Fig. 1). The construction of the Choke Canyon Dam, located northwest of the town of Three Rivers, Texas, coupled with the impending inundation of the reservoir basin necessitated salvage operations at many sites within the reservoir area (Hall, Black, and Graves 1982:1-2). Initial work suggested that 41 LK 201, consisting of stratified Archaic and Late Prehistoric components, represented one of the more significant sites recorded in south Texas, particularly with respect to the Late Prehistoric component. As a result, three seasons of field work were eventually carried out at the site.

Site 41 LK 201 was recorded in 1977 by crews from the Cultural Resources Institute, Texas Tech University (CRI-TTU) during a 2430-hectare (6000-acre) archaeological survey conducted in the Choke Canyon Reservoir region (Thoms, Montgomery, and Portnoy 1981:38). Because the site was located along the western edge of a borrow area, there was the distinct possibility that the site would be partially or completely destroyed as dam construction progressed. Under terms of the Phase I contract (No. 7-07-50-V0897) issued by the U.S. Bureau of Reclamation (USBR), to the Center for Archaeological Research (CAR), The University of Texas at San Antonio (UTSA), 41 LK 201 was included as one of several sites in need of additional investigation and evaluation (**ibid.**:64).

In 1978, a CAR field crew initiated work at the site. A surface reconnaissance was conducted, and a series of shovel tests was placed at intervals along the length of the site. Three test pits and four trenches were subsequently placed at the southeastern end of the site where shovel testing had indicated concentrated prehistoric materials were most abundant (Fig. 2). The results of this initial phase of work has been documented in Hall, Black, and Graves (1982:64-81). Based upon the findings of the Phase I investigations, extensive excavations were recommended at 41 LK 201 during Phase II investigations.

The Phase II investigations at 41 LK 201 were part of the research program carried out under terms of Contract No. 0-07-5B-V0835 issued to the Center for Archaeological Research, The University of Texas at San Antonio (CAR-UTSA) by the U.S. Bureau of Reclamation (USBR). The investigations were required under the National Historic Preservation Act of 1966, as amended. Other relevant legal instruments include Executive Order 11593 and Public Law 93-29. The specific program of Phase II research was as stipulated in a Memorandum of Agreement dated June 5, 1980, and signed by the Chairman of the Advisory Council on Historic Preservation, the Southwest Regional Director of the USBR, and the Texas State Historic Preservation Officer. A scope of work detailing the basic contract requirements of Phase II research is included as Appendix I to this report.

The Phase II excavations, consisting primarily of two large excavation blocks, were aimed at providing horizontal control as well as determining the vertical extent of the deposits. These excavations in 1980 revealed an extensive Late Prehistoric occupational zone with an Archaic component in the lower levels. Two large areas (A and B), and one smaller area (C), were

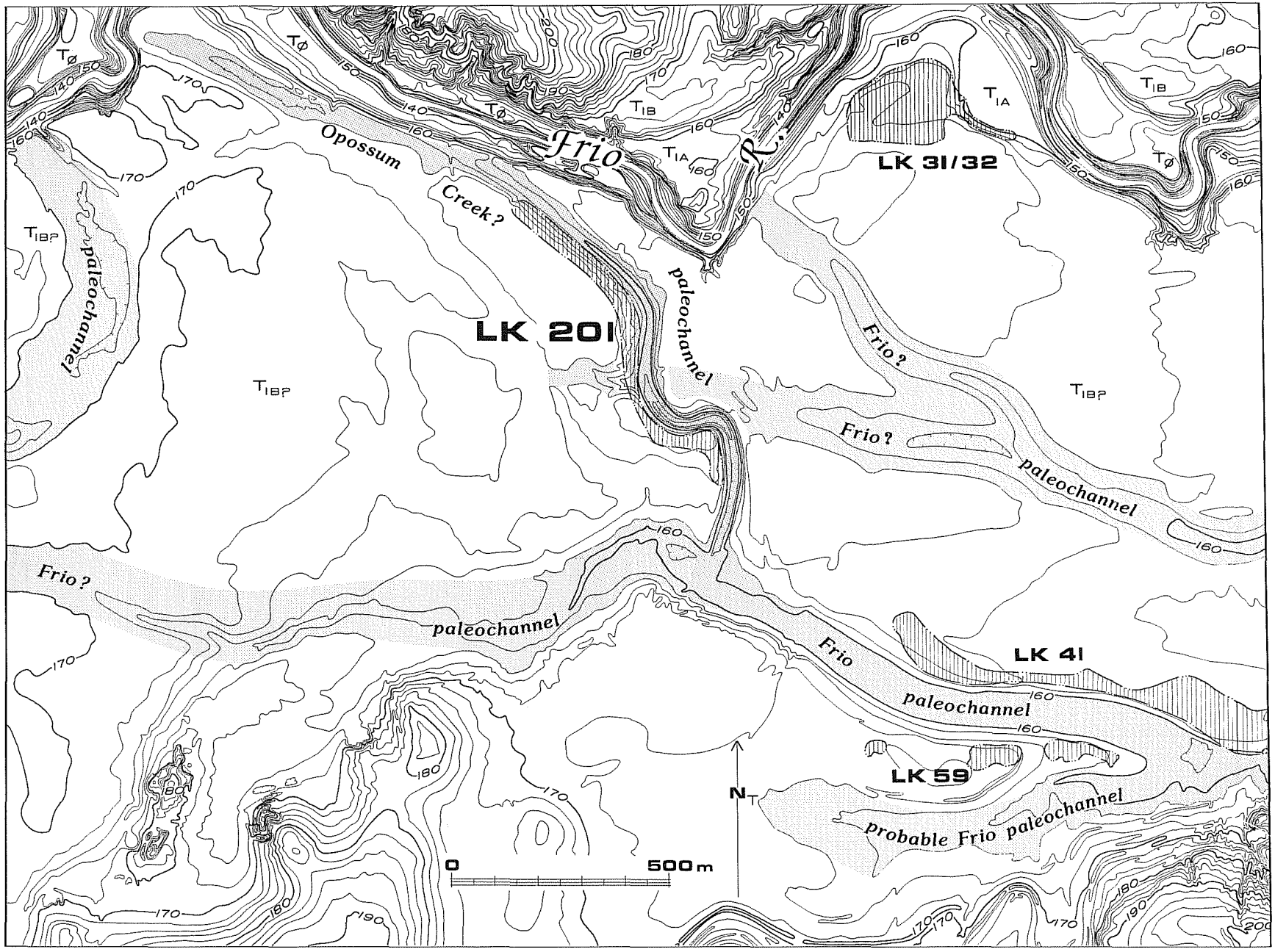


Figure 1. **Topography of Site 41 LK 201 and Surrounding Environs.** Site 41 LK 201 and other sites in the immediate vicinity of the Choke Canyon Dam are now inundated.

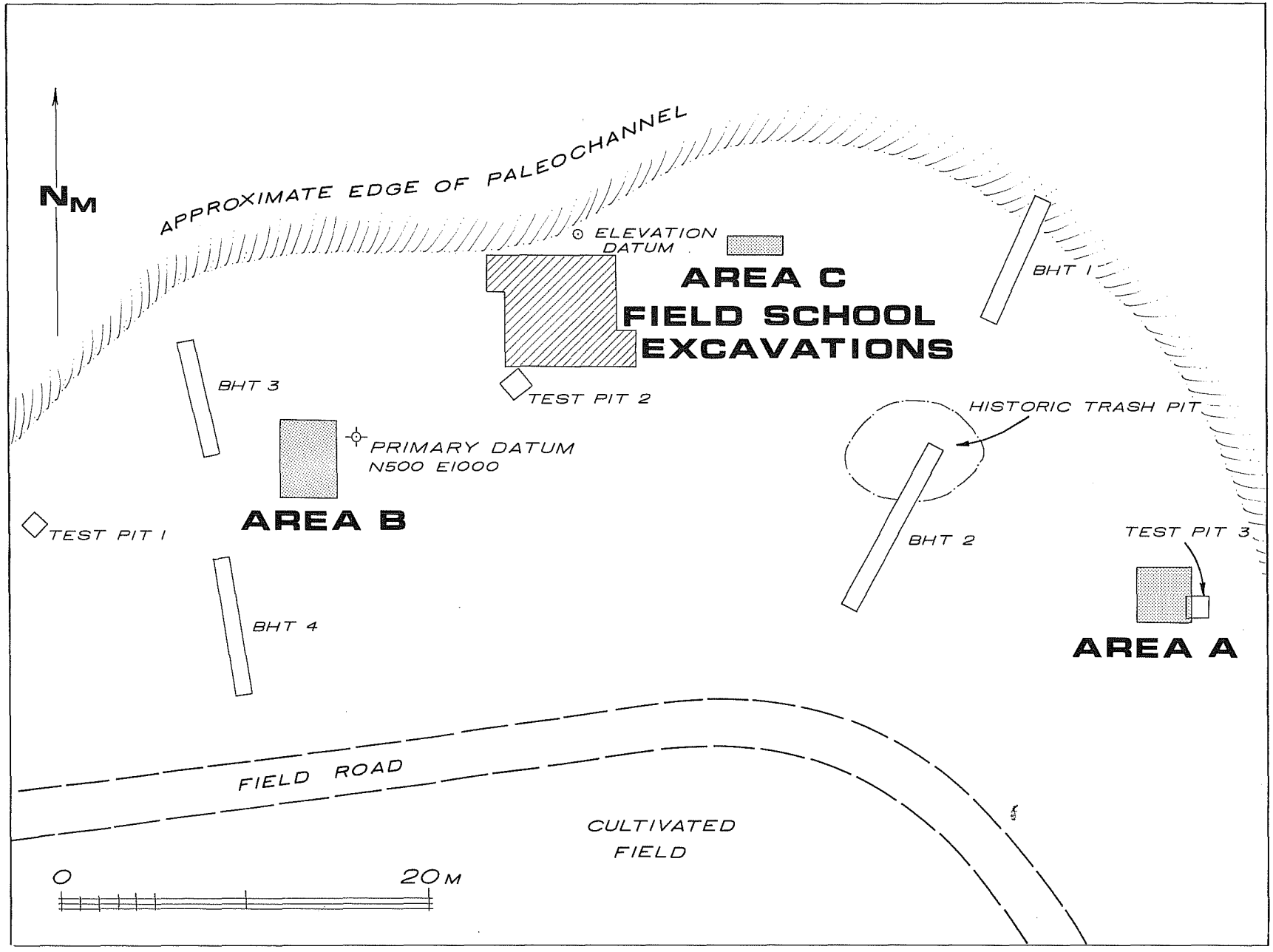


Figure 2. **Extent of Investigations at 41 LK 201.** Shown are the Phase I excavations, Test Pits 1-3 and Backhoe Trenches 1-4; the Phase II excavations, Areas A, B, C; and the UTSA Field School excavations.

excavated (Fig. 2). A crew consisting of 10-12 persons spent approximately 35 work days at the site from August 6 to September 24, 1980, under the direction of Kenneth M. Brown. Because 41 LK 201 represented one of the best preserved Late Prehistoric sites in south Texas, a third season of work (summer 1981) was conducted by the UTSA Archaeological Field School. A large area was excavated; work was directed towards the horizontal exposure of a portion of the Late Prehistoric zone. The UTSA Field School session, June 1 to July 3, 1981, was attended by 19 students under the direction of Dr. Thomas R. Hester.

Results of Phase I as discussed by Hall, Black, and Graves (1982) will be briefly reviewed in this volume. The primary goal of this report, however, is to describe and discuss the investigations carried out at 41 LK 201 during Phase II and the subsequent UTSA Field School excavations with an emphasis placed on the Late Prehistoric component. Phase II excavations will be discussed in Part I of this volume; the UTSA Field School excavations will be discussed in Part II. Although this may at times appear to be confusing to the reader, it was decided to discuss the investigations separately since excavation strategies and research goals differed for the two excavations. The concluding section of this report will be devoted to incorporating the interpretations of the excavations into a final statement regarding the site.

It should be stressed that the author was not present during the excavations. The discussions of field strategies and excavation observations are based on a daily journal kept by Kenneth M. Brown and Grant D. Hall and excavations notes kept by individual members of the field crew. Laboratory analysis for Phase II materials was conducted by the author and Courtenay J. Jones. Descriptions of the UTSA Field School excavation procedures and observations are drawn from a daily log kept by Dr. Thomas R. Hester and excavation notes kept by students attending the UTSA Field School. Cultural materials recovered during the final season of work at the site were partially catalogued by the students and analyzed by the author.

THE NATURAL SETTING

The environmental setting for the region encompassing the Choke Canyon Reservoir region has been described in detail by Lynn, Fox, and O'Malley (1977), Thoms, Montgomery, and Portnoy (1981), and Hall, Black, and Graves (1982). To avoid repetition, only a summary of the various features of the setting will be provided in this report.

Choke Canyon Reservoir is located in Live Oak and McMullen Counties approximately 6.4 km (four miles) west of the town of Three Rivers. The damsite is approximately 16 river kilometers upstream from the confluence of the Frio and Nueces Rivers and about six river kilometers upstream from the confluence of the Frio and Atascosa Rivers (Lynn, Fox, and O'Malley 1977:4). The major drainage systems flow in a southeasterly direction across the coastal plain. Near Choke Canyon, however, the Nueces and Frio Rivers begin a northeasterly pattern to compensate for a line of low-lying hills. These rivers, along with the Atascosa River, are forced by the hills to converge into a single channel (Hall, Black, and Graves 1982:3). The location of this merger is aptly named "Choke Canyon" (Lynn, Fox, and O'Malley 1977:5).

The study area is located on the Rio Grande Plain, a subdivision of the West Gulf Coastal Plain physiographic province. The region is generally level to gently rolling with occasional scattered lines of hills. The action of the Frio River has created a broad, low-relief valley which is broadest across the eastern half of the reservoir (Hall, Black, and Graves 1982:5). The width of the valley varies from four to five miles; the Frio River occupies a channel that is 150 feet at its widest point (**ibid.**:4). The Frio River floodplain also contains a series of older river channels termed "sloughs," portions of former terrace systems, and smaller drainages. San Miguel Creek, Opossum Creek, Willow Hollow Creek, and Salt Creek are major upland drainages to the Frio River (Hall, Black, and Graves 1982:5).

Geologically, the Frio River valley consists of three formations. The Eocene Jackson Group crops out in the western portion of the region and consists of interbedded clays, ash, and sands (Sellards, Adkins, and Plummer 1966:68). Resistant sandstone within this geologic entity forms bluffs at the western end of the reservoir basin (Hall, Black, and Graves 1982:4). The Oligocene Frio Formation occurs across the central portion of the Choke Canyon basin and contains dark gray green clays, shales, and sand (Sellards, Adkins, and Plummer 1966:706-707). This formation supports gradually sloping valley margins (Hall, Black, and Graves 1982:4). The Miocene Catahoula Formation contains tuff, tuffaceous sand, sandstone, clay, and silt (Rogers 1967:20). The Choke Canyon Dam is footed on the bedrock of the Catahoula Formation (Hall, Black, and Graves 1982:4).

The semiarid or subtropical climate of this region produces an average of 16 to 35 inches of rain per year (Gould 1975:12) and an average temperature of 74°F (Hall, Black, and Graves 1982:3). Long, hot summers are followed by brief, mild winters. Rainfall is greatest in late spring (May) and early fall (September; Carr 1967:11). Hurricanes in late summer or early fall may greatly increase the amount of annual rainfall for this region. The rainfall from Hurricane Beulah in 1967 resulted in the inundation of the town of Three Rivers and heavy flooding in the nearby community of Tilden (U.S. Department of the Interior, Geological Survey 1967:472). Conversely, long periods of drought have also been documented for this region (U.S. Department of the Interior 1975). Additional information regarding climate and weather can be found in Carr (1967) and Thoms, Montgomery, and Portnoy (1981:7-10).

The modern-day vegetation of the Rio Grande Plain includes mesquite, blackbrush, guajillo, huisache, catclaw, cenizo, prickly pear, and whitebrush (Inglis 1964:1). In Choke Canyon, these species are particularly dense along the various stream drainages and sloughs. Blackbrush acacias and guajillo are predominant in the uplands and valley margins of the Frio River valley. Live oak, willow, elm, sugarberry, hackberry, ash, pecan, and mustang grapevines are common along the margins of the Frio River and major creeks. Mesquite, whitebrush, huisache, prickly pear, spiny hackberry, and Texas persimmon are present in the regions between the river channel and the valley margins (Hall, Black, and Graves 1982:6). Speculations regarding prehistoric plant communities are provided in Hester (1980:36), Hall, Black, and Graves (1982:7), and Dering (1982:518-530).

Discussions of animal species in modern-day south Texas have been provided by Blair (1950, 1952), Thoms, Montgomery, and Portnoy (1981:11-14), and Hall,

Black, and Graves (1982:7). Mammals present in south Texas include white-tailed deer, javelina, coyote, squirrel, cottontail rabbit, jackrabbit, raccoon, opossom, fox, badger, skunk, bobcat, and rodents. The birds from this area include wild turkey, bobwhite, quail, hawk, duck, dove, vulture, crane, and owl. A variety of turtles, snakes, lizards, and fish are also present.

Archaeological research in south Texas has prompted a number of studies aimed at reconstructing prehistoric environmental conditions (Hester 1975a:107-109, 1976, 1978a:3-4, 1981:120-121). Vegetational patterns have been severely altered, and changes in available surface water and faunal inventories have occurred. Historic documentation and archaeological implications indicate that during prehistoric times much of south Texas was a savannah grassland with woody vegetation present along stream drainages. In contrast, the modern-day landscape is marked by widespread mesquite forests and other thorny plant species (**ibid.**). This change in vegetational patterns is linked to a number of causes, including ranching activities which resulted in overgrazing and the dispersal of mesquite seeds by cattle. Suppression of prairie fires and climatic changes may also have influenced the spread of thorn brush (Hester 1975a, 1976, 1978a; cf. Inglis 1964; Bogusch 1952). Numerous perennial streams were present until the early 1900s, but the amount of water is less in modern times due to watershed destruction and deep-well irrigation (Hester 1975a:109).

Faunal studies indicate that bison, antelope, and bear, no longer indigenous to this region, were available to prehistoric man (Hester 1975b:17-18, 1980:36). Other species, such as armadillo, are believed to be recent intruders into the region (Hester 1980:37). Javelina, once believed to be a recent intruder, has now been documented at several Late Prehistoric sites in south Texas (Hall, Black, and Graves 1982:244; Appendix V, this volume; Stephen L. Black, personal communication).

ARCHAEOLOGICAL BACKGROUND

An extensive review of publications concerning south Texas archaeology was recently prepared by Graves (1982:7-26). Reports dating from the 1930s to 1981 were included in the synthesis. No attempt will be made in this study to repeat this sort of assessment. Instead, this report, with its emphasis on the Late Prehistoric period, will provide a summary of the literature that pertains to this late period of aboriginal activity in south Texas.

Suhm, Krieger, and Jelks presented a review of the archaeology of Texas in 1954. At this time the region referred to as "Southwest Texas" had received very little professional attention. According to Suhm, Krieger, and Jelks (1954:20) three prerequisites--pottery, arrow points, and agriculture--were necessary for the Late Prehistoric (termed "Neo-American" by the authors) to be recognized within a region. Although the presence of arrow points was documented in southern Texas, the other two cultural traits were believed to have been absent from this region until introduced by the Spanish.

Since this early assessment, archaeological field work and research has accelerated in southern Texas, and the Late Prehistoric period is the best

defined temporal entity for this region. A hunting and gathering lifeway continued from Archaic times, but two major changes in the cultural inventory are evident. The bow and arrow was introduced ca. A.D. 1100, and its use is reflected in the occurrence of numerous arrow points. Locally produced pottery is also present, usually occurring as bone-tempered, undecorated sherds. Complete vessels are rarely found. Initially documented by Hester (1968) and Hester and Hill (1971), this cultural innovation has subsequently been recorded at numerous sites throughout south Texas and appears to occur sometime after A.D. 1200 (Hester 1980:124). Other Late Prehistoric diagnostic items are small end scrapers, perforators or drills made on flakes, laterally trimmed flakes, and beveled knives (Hester 1976:5, 1980:158). Bison bone is often present in the faunal assemblages from sites dating after A.D. 1200 (**ibid.**).

Initial attempts to define this region's late prehistory were based on surface investigations and excavations concentrated in the northwestern portion of south Texas, primarily in Zavala and Dimmit Counties (Hester and Hill 1971, 1975; Hester 1975a, 1975b). Extensive investigations carried out on the Chaparrosa Ranch and at other nearby locales have provided information regarding chronology, site distributions, environmental studies, subsistence patterns, and cultural assemblages (Hill and Hester 1971; Hester and Hill 1975; Hester 1976, 1978b; Montgomery 1978).

In this northwestern portion of south Texas, occupation sites are typically thick, concentrated middens consisting of land snails, mussel shells, fragmented animal bone, lithic tools and debris, hearthstones, and charcoal. They are usually situated on the floodplains in the resource-rich riparian zones which parallel stream drainages (Hester 1975a:111-112; Hester and Hill 1975:7). Often, long-term, repeated use of a site is indicated by Archaic materials underlying Late Prehistoric materials (**ibid.**). Smaller, briefly occupied hunting and gathering sites are located in the uplands with lithic workshops or quarry sites present along high gravel terraces where chert outcrops occur (Hester 1976:6).

The material culture of the northwestern sector has been discussed by Hester and Hill (1971, 1975), Hester (1975a, 1978c), and Montgomery (1978). The dominant projectile point style is the **Perdiz** arrow point. **Scallorn** and **Edwards** points also occur as do several triangular forms. A short, stubby point, the **Zavala** type, appears to represent an intermediate between dart points and arrow points (Hester 1975a:114; Montgomery 1978:21). Several arrow point styles usually occur together at sites in this region without apparent stratigraphic separation (**ibid.**). In contrast to this, Late Prehistoric sites in central Texas exhibit internal sequencing with **Scallorn** points preceding **Perdiz** points (Hester 1975a:114). Other distinctive Late Prehistoric elements of the cultural assemblage found at sites in Zavala and Dimmit Counties are small end scrapers, small drills, laterally retouched flakes, quartzite hammerstones, bone flaking tools, grooved stones used as arrow shaft straighteners, and pottery. Material components may vary slightly from site to site. Debitage analyses have been carried out by Hill and Hester (1971), Hester and Hill (1972, 1973), Hester (1978c:24-32), and Montgomery (1978:129-136). Radiocarbon dates range from A.D. 1440-A.D. 1760, although future radiocarbon assays will probably place the beginning of the Late Prehistoric period to ca. A.D. 1300 (Hester 1975a:120).

Although Late Prehistoric sites in other portions of south Texas are generally similar to those in Zavala and Dimmit Counties, regional differences may have necessitated localized adaptations. The majority of Late Prehistoric sites in the central portion of south Texas, radiocarbon dated to the 13th and 14th centuries, are often characterized by **Perdiz** points, beveled knives, flake tools, pottery, and bison bone.

Hester and Parker (1970) have described the Berclair site near Miller Creek in Goliad County. Unlike sites in the northwestern sector of south Texas where several arrow point styles are apparently contemporaneous, only **Perdiz** points were present at the Berclair site. Other characteristic Late Prehistoric items from this site are bone-tempered pottery, beveled knives, small end scrapers, and bison bone. A sandstone pipe fragment and a marine shell fragment were also recovered. The authors (**ibid.**:20) noted that the distinctive cultural items (**Perdiz** points, plain bone-tempered pottery, beveled knives, and end scrapers) are similar to artifact inventories of the Toyah phase of the Central Texas Aspect.

The Hinojosa site (41 JW 8) is located along Chiltipin Creek in northern Jim Wells County (Hester and Bass 1974; Hester 1977). As at the Berclair site, initial excavations revealed a cultural assemblage consisting of **Perdiz** points, small end scrapers, bone-tempered pottery, and bison remains. Large quantities of bison bone, along with 26 other identifiable faunal species, were recovered. Two beveled knife fragments, a flake graver, a fragmentary conch shell bead, and another marine shell fragment were also recovered. The site has been radiocarbon dated to ca. A.D. 1300 (Hester 1977:27).

Additional excavations were carried out at 41 JW 8 in 1981. Several expanding stem and triangular arrow points were recovered from the upper levels with numerous **Perdiz** points. Bone-tempered pottery, small end scrapers, ulna flaking tools, beveled knives, and large quantities of faunal remains were recovered. Additional radiocarbon dates suggest a later occupation of between A.D. 1350 and 1400 (Black n.d.).

Site 41 LK 106, a Late Prehistoric site located near a steep bluff that overlooks Sulphur Creek, may represent a temporary campsite (Creel **et al.** 1979). Excavations revealed two serrated arrow point fragments, pottery sherds, burned rock, crude bifaces, utilized flakes, chipping debris, snail shells, and mussel shell fragments. Typical artifacts, such as finished projectile points, beveled knives, and animal bone are absent from the site. Because of the lack of typical cultural items associated with larger base camps, this locale appears to represent a temporary campsite, one used briefly for hunting, gathering, and/or lithic procurement (**ibid.**).

Settlement pattern studies for the Choke Canyon region indicate that prehistoric sites generally occur along sloughs and channels on the Frio River valley floor (Hall, Black, and Graves 1982:466). Late Prehistoric sites tend to appear as subcircular or oval aggregations of cultural materials often within the confines of larger Archaic sites (**ibid.**:467). Repeated use of the sites is often indicated by the presence of Archaic materials lying below Late Prehistoric materials. Typical Late Prehistoric items recovered are arrow points, beveled knives, flake tools, pottery, bone beads, bone tools, lithic debitage, and bison and other animal bone.

Radiocarbon dates range from A.D. 1260-1290 to A.D. 1520-1610 (Hall, Black, and Graves 1982:652; Hall, Hester, and Black 1986:Appendix VI).

The Gulf coastal region of southern Texas, located east of the study region, has two localized Late Prehistoric complexes. The Rockport complex, occurring in the Corpus Christi area, consists of **Perdiz** and other stemmed arrow points, sandy paste pottery, and a core-blade industry (Campbell 1958; Corbin 1974; Hester and Shafer 1975; Hester 1975a). The Brownsville complex occurs near the mouth of the Rio Grande. Shell artifacts dominate the artifact inventories, suggesting a sophisticated shell industry. Cemetery sites occur in this area, and there is evidence that these coastal groups carried out trade with Huastecan groups (cf. MacNeish 1958; Hester 1975a). Information concerning Late Prehistoric cultural complexes along the coastal strip can be found in Campbell (1960), Story (1968), Corbin (1974), Prewitt (1974), Hester (1969, 1976), and Mallouf, Baskin, and Killen (1977).

SITE DESCRIPTION

Site 41 LK 201 is situated west of the Choke Canyon Dam on the south side of the Frio River and parallels the west bank of an extinct channel or slough of the Frio River (Fig. 1). As described previously by Hall, Black, and Graves (1982:64), the long, narrow occupational zone, a 50-m-wide band of predominantly prehistoric cultural debris, extends about 800 m along the natural levee of the channel. The width of the site increases to 80 m or more at the southeastern end where the slough turns abruptly in a southerly direction. A plowed and cultivated field occupies the adjacent floodplain except for a narrow band of vegetation occurring along the slough (Fig. 3,a,b). Vegetation in the area includes mesquite, elm, hackberry, whitebrush, Mexican persimmon, spiny hackberry, guajillo, other low brush varieties, and grasses.

The site topography is generally characterized by a gradual slope from the field down into the slough. However, the southeastern end of the site near the abrupt southeasterly curve of the slough is somewhat higher than the channel. It is on this higher ground that the most concentrated prehistoric occupations occurred. Although prehistoric material was predominant, a scattering of historic materials did occur near the southeastern end of the site. The ground surface for most of the site (except for the slope adjacent to the slough) has probably been disturbed by brush chaining during recent times to prepare this area for cultivation (**ibid.**).

As work was initiated during Phase I (1978), the slough contained water gained through rainfall and floodwater overflow from the Frio River. During the following months, all of the water gradually evaporated. Great quantities of aquatic snail shells, mussel shells, and several gar fish littered the dry bed of the slough. An abandoned alligator den was observed near the southeastern end of the slough (Hall, Black, and Graves 1982:64). When work resumed during Phase II (1980), the slough again filled with water from heavy rains associated with the passage of Hurricane Allen. The slough had been dammed by the recent construction of an earthen dike east of the site. During the 1981 season, heavy rains again filled the channel, and an alligator was observed living in the slough.

Figure 3. **Phase II Excavations: Site Views and Feature Excavations.**

a, view west to southeast end of site. Slough channel is in foreground. Rise of natural levee is visible along tree line;

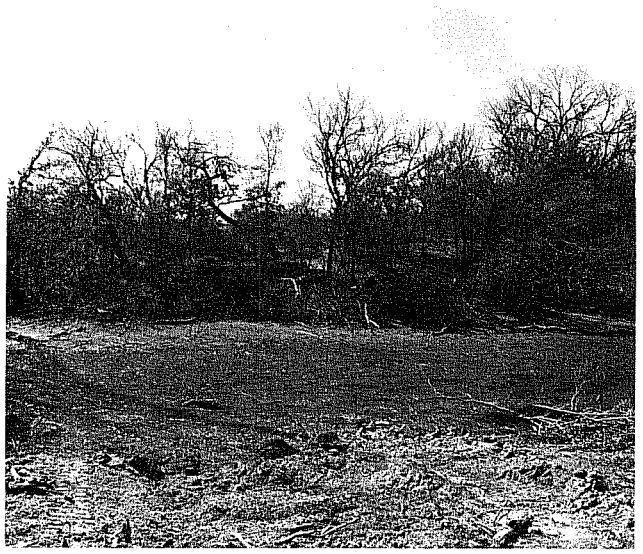
b, view of site, looking west. Area A is in foreground. Slough channel is to the right;

c, upper portion of Feature 5, Area A, looking west;

d, Feature 5 is exposed **in situ** looking west. Floor of unit is at the base of Level 12 (97.55-97.45 m). Note burned soil around hearth;

e, Area A, remnant of Feature 2 exposed west of Phase I excavation (TP 3);

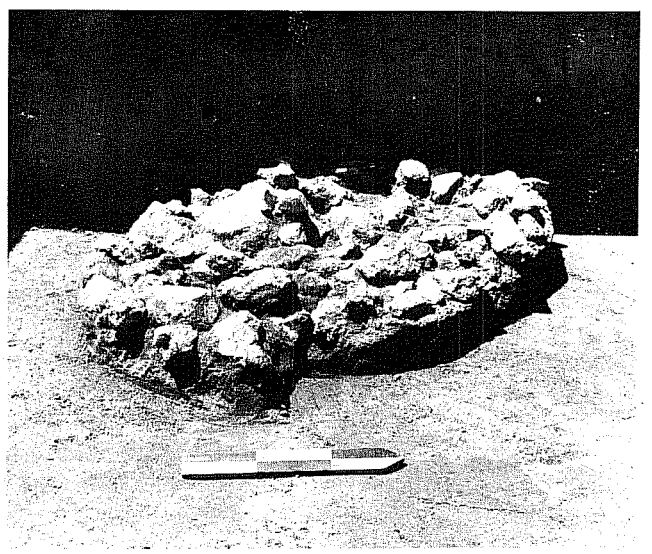
f, Area A, Feature 2. View of fired clay walls and charcoal.



a

b

c



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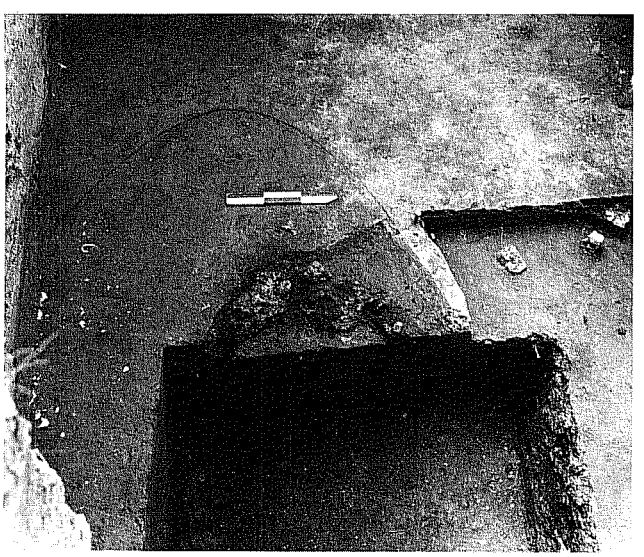

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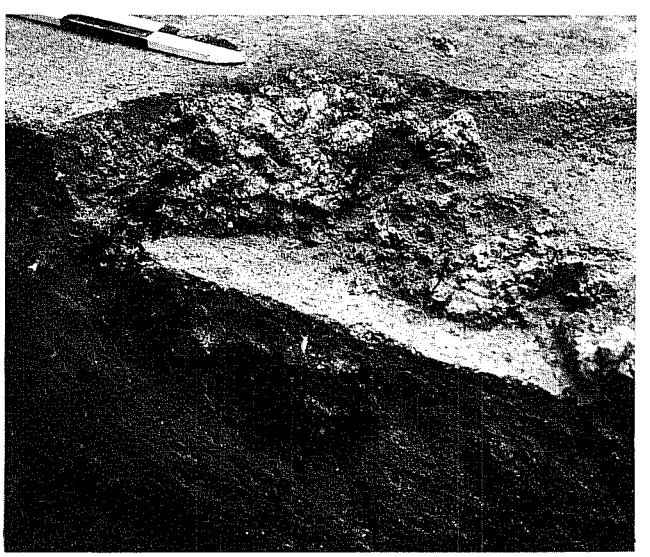


f

Site 41 LK 197 is located near the southeast end of 41 LK 201 on the opposite side of the slough. The site consists of a historic component associated with the Mark Mahoney Ranch headquarters, and a prehistoric component observed in shovel tests and in the banks of the slough northwest of the house (**ibid.**:81-82).

THE PHASE I FINDINGS

The CAR investigations of 41 LK 201 began in March 1978 with a provenienced surface collection and a series of shovel tests placed at 50- to 100-m intervals down the length of the site (Hall, Black and Graves 1982:64-66). Very light recovery was made at the northwestern end of the site. Near the southeastern end of the site the amount of cultural debris began to increase. Large amounts of bone were noted, and excavations revealed that preserved bone extended to a depth of one meter or more.

Following shovel testing, three 1-m^2 test pits were excavated, and four backhoe trenches in two transects were placed between the test pits (Fig. 2). The materials recovered from these investigations (Phase I) are described and discussed in Hall, Black, and Graves (1982:64-81). An extensive Late Prehistoric component was in the upper levels. The assemblage in the lower levels was attributed to the Late Archaic period (**ibid.**). The deposit, consisting of 180 cm, was stratified into distinct zones. Late Prehistoric materials recovered were **Perdiz** points, small unifacial end scrapers, bone-tempered pottery, and bison and other faunal remains. Several beveled knives that can be attributed to the Late Prehistoric period were recovered from the surface. The Archaic zone contained several unstemmed, triangular, or leaf-shaped thin bifaces which conform to the descriptions of **Tortugas** and **Refugio** points. One **Fairland** or **Ensor** point was also recovered. Other Archaic materials recovered were ground stone artifacts, bifaces, unifaces, and faunal remains. Several burned rock features were also present in the lower levels, including Feature 2, the most complex burned rock feature exposed during the Phase I excavations in the study area. Charcoal from this hearth was radiocarbon dated to 1300 B.C. (MASCA corrected; Hall, Black, and Graves (1982:76).

RESEARCH GOALS, PHASE II

The research goals for the Phase I investigations of the Choke Canyon Reservoir Project included establishment of a cultural/chronological sequence for the south Texas region as well as providing needed information on paleoenvironment, prehistoric subsistence pursuits, settlement patterns, and lithic technologies (Hall, Black, and Graves 1982:26-28). As it turned out, the vast majority of the sites investigated during Phase I, however, lacked clear-cut stratigraphy, time-diagnostic artifacts, preserved animal bone, and charcoal samples suitable for radiocarbon dating, all of which were necessary to achieve the goals originally set forth. Fortunately, a few sites, including 41 LK 201, proved to be important exceptions and warranted additional, extensive excavations.

Site 41 LK 201 was subjected to shovel testing, limited backhoe trenching, and test excavations during Phase I (Hall, Black, and Graves:64-81). The well-stratified layers indicated that a Late Prehistoric component was present, overlying Archaic remains. Chipped stone diagnostics recovered were dart points, distally beveled bifaces (gouges), arrow points, and one beveled knife fragment. Bone-tempered ceramic sherds were found in the upper levels, and several **in situ** burned rock features were investigated in the lower levels. Preserved faunal remains and wood charcoal, in varying amounts, were present throughout the levels.

Phase I testing indicated that more significant and productive Late Prehistoric cultural remains were located along the southeastern end of the site (Center for Archaeological Research 1980:18). The excavation strategy for Phase II called for two large blocks to be placed in this area of the site which would expose, both vertically and horizontally, the prehistoric remains. Initial plans were to excavate a 4-m^2 block and a 3-m^2 unit, both to depths of 150 to 200 cm. Horizontally, these large excavation blocks would provide broad exposure of buried cultural remains which, in turn, would aid in understanding intrasite patterning of such items as faunal remains, lithic tool kit components, and burned rock features. The proposed vertical extent of the excavations was based on Phase I work at the site.

THE MIDDLE AND LATE ARCHAIC PERIODS

The Phase I analysis of Choke Canyon materials resulted in a tentative assessment of a regional chronology. The time period of 2500 B.C.-A.D. 1200, encompassing the Middle and Late Archaic periods, was the least satisfactorily defined (Hall, Black, and Graves 1982:469). The Phase II investigations, however, involved intensive excavations at several stratified sites with preserved charcoal and diagnostic artifacts. These excavations and subsequent analyses have permitted a refinement of the temporal limits of the Middle and Late Archaic periods and have provided an assessment of cultural components for each time period (Hall, Hester, and Black 1986:398-402).

Although Phases I and II excavations at 41 LK 201 resulted in the recovery of only a few dart points and distally beveled tools, these diagnostic forms provide guidelines in defining Middle and Late Archaic tool kits. Charcoal samples from the lower deposits place the intermittent occupational zones and their assemblages within a chronological framework. Faunal studies provide a unique opportunity to compare Archaic remains with Late Prehistoric remains. The burned rock features present at 41 LK 201 are typical of other Middle and Late Archaic deposits in the Choke Canyon region. Although additional investigations are needed at other south Texas sites with Archaic components, site 41 LK 201 has played a major role in attempting to define the Middle and Late Archaic periods in the Choke Canyon region.

THE LATE PREHISTORIC PERIOD

Phase I investigations of the upper deposits, which contained the Late Prehistoric component, revealed an artifact assemblage consisting of **Perdiz** arrow points, beveled knives, small drills, end scrapers, bone-tempered

pottery, and an extensive faunal assemblage, including bison. These components are generally found at Late Prehistoric sites in south Texas that date to the 13th and 14th centuries (Hester 1980, 1981). Phase II was designed to add to the current understanding of this latter phase of prehistoric existence in south Texas.

The nature of the chipped stone tool kit in the Late Prehistoric at 41 LK 201, and its relationship to tool kits from other south Texas sites, required further clarification. Phase I excavations resulted in the recovery of **Perdiz** points as the sole arrow point style. Typically, Late Prehistoric sites in south Texas yield a combination of two or three arrow point forms (Hester 1980:158). Two other Choke Canyon sites intensively excavated have revealed several arrow point forms. Site 41 MC 222 contained **Scallorn** and **Edwards** points, as well as a few straight stem arrow points (Hall, Black, and Graves 1982:238-246; Hall, Hester, and Black 1986:404), while site 41 MC 296 shows stratigraphic separation of expanding stem points (**Scallorn** and **Edwards** forms) and contracting stem points (**Perdiz** form; Hall, Hester, and Black 1986:174). In nearby portions of south Texas, the Berclair site contained **Perdiz** points as the sole arrow point form (Hester and Parker 1970), while 41 JW 8 yielded predominantly **Perdiz** points with a few expanding stem forms (Black n.d.). There are also similarities between 41 LK 201 and Toyah phase sites in central Texas which are typified by the presence of **Perdiz** points. In addition to **Perdiz** points, other items usually present at Late Prehistoric sites in south Texas are beveled knives, small end scrapers made on flakes, and small drills or perforators which are similar to tool forms recognized at Toyah phase sites in central Texas (Black n.d.). Bison bone often occurs at these sites, and it is likely that these tool forms, particularly the beveled knives, were technological innovations used in bison butchering and hide processing activities. Because of the excellent bone preservation at 41 LK 201, direct association of these tools with bison remains would lend support to the premise that these tool forms were task-specific implements associated with bison processing.

During Phase I, a total of 51 ceramic sherds representing 12 distinct groups was recovered from 41 LK 201. Fugitive red filming and asphaltum edge-mending, unusual features for south Texas ceramics, were noted on a few of the sherds. The site contained one of the more diverse and best-preserved ceramic samples in the Choke Canyon region and analysis had the potential to enhance our understanding of the ceramic tradition in south Texas in terms of chronology, decorative techniques, vessel shape and function, spatial distribution of sherds, and intrasite patterning within the reservoir region.

The abundance of wood charcoal was seen as a much needed opportunity to acquire additional radiocarbon dates for the Late Prehistoric period in south Texas. During Phase I, only one site, 41 MC 222, provided radiocarbon dates for the Late Prehistoric period. Two dates, ranging from A.D. 1260 to 1290, were obtained (Hall, Black, and Graves 1982:465). Current data suggests that the Late Prehistoric period begins 300 to 400 years later in south Texas than in central Texas (**ibid.**).

Dr. Gentry Steele of Texas A&M University was the project's faunal analyst, and he addressed the following areas: structure of the bone assemblage, seasonal utilization of the site, description of the taxa, dietary patterns,

hunting and harvesting patterns, and environmental reconstruction. In addition, comparison of the vertebrate faunal assemblages would hopefully reveal distinct differences in subsistence bases for the Archaic and Late Prehistoric peoples.

Large block excavations were used in an effort to discern patterning of artifacts. It was hoped that various workshop areas, wuch as tool making locales, butchering and/or hide processing stations, cooking areas, etc., would be revealed.

The 1980 Phase II investigations verified the importance of the Late Prehistoric component at the site, and the decision was made to return to the site to further investigate this component. A third field season was carried out by a UTSA Field School, and its objectives are discussed in Part II of this report.

PART I: THE PHASE II INVESTIGATIONS

METHODS OF EXCAVATION

The archaeological grid was begun from the permanent datum, a rebar set in concrete, established during Phase I investigations at the site (Fig. 2). This was arbitrarily designated N500 E1000. North to south baselines were established by centering a survey transit over the primary datum and orienting it to magnetic north. A line of stakes running south were set at N480, N460, and N440 along the E1000 line. Another stake was set at N475 E1000 as a turning point for an east to west baseline. Other units were then established from the baselines using both the transit and measuring tape triangulation.

During initial testing of the site in 1978, a 100-penny nail was driven into the trunk of a large mesquite tree near the bank of the slough. The upper surface of this nail was arbitrarily designated 100.0 m, and this fixed point was used as the primary datum for all subsequent work on the site.

During Phase II excavations, elevation control in individual excavation units was maintained by wooden stakes driven into the ground, one on each side of the excavation block. An even elevation increment was located and marked on each stake, and a string was tied to the stake at that elevation. Line levels and 3-m hand tapes were then used to measure depths below these known points. Having a stake adjacent to each wall meant that it was unnecessary to level the string over a distance of more than about 2 m. When the large block excavations became too deep for these stakes to be used conveniently, 50-penny nails were driven into each wall, again at even increments, and marked with a tag. These were used for line leveling in the same way as the wooden stakes. Each excavator was responsible for performing the necessary arithmetic to convert depths to absolute elevations in reference to the primary datum.

Two major block units were excavated (Figs. 2 and 4). Area A, a 3-m^2 block unit, was placed adjacent to and including Test Pit (TP) 3 of the Phase I investigations. Area A coordinates ran from N490 to N492 and E1042 to E1044.

Another 3-m^2 block unit was laid out to the west of the permanent datum and designated Area B (Figs. 2 and 4). Area B coordinates were N497 to N499 and E996 to E998. This block was later expanded by three additional 1-m^2 units placed along the northern edge and designated N500 E996, N500 E997, and N500 E998 (Fig. 4). The elevation datum stake was moved to the north side of Area B since opening up three new squares would cause the removal of the existing one. The 1-m^2 units of each block in Areas A and B were excavated separately in 10-cm levels. A group of three 1-m^2 units (N510 E1020, N510 E1021, N510 E1022) comprised Area C which was excavated in 5-cm levels. Area C was designed to test the Late Prehistoric component with 5-cm levels used to facilitate better control of concentrated cultural remains.

Initially, excavated materials from Areas A and B were dry screened through 1/4-inch mesh hardware cloth. After several weeks, rain filled the slough, and water-screening operations were set up on the bank of the slough north of TP 2 (Phase I) and west of the elevation datum. The water-screening procedure was initiated because of the available water source and to insure maximum recovery of cultural debris, particularly small bone fragments. The lower levels of these areas and all levels of Area C were water screened through 1/4-inch mesh except for those units designated fine screen units which were water screened through coarse (1/8-inch) screen and fine (window mesh) screen. Table 1 provides information explaining screening procedures per unit-level and indicates certain lower levels in Area B that were discarded without screening because previous excavations had shown these levels to be unproductive.

Cultural debris associated with features was left pedestaled and then recorded on measured plan drawings at a scale of 1 inch = 20 cm. Transit elevations were recorded for the base of most items. Matrix samples were collected from each feature. Soil column samples were collected from the west wall of the Area B excavation block at Unit N500 E996. The column was 30-cm wide and extended from the surface down 2.5 m to the base of Level 25. Samples were collected at 5-cm levels, giving a total of 50 samples.

THE PHASE II EXCAVATIONS

Following analytical procedures used for Phase I materials, the excavated materials from Areas A and B were combined into assemblages representing a series of horizons (Hall, Black, and Graves 1982:66). The term "horizon" is used, for comparative purposes, to conform to the Phase I analysis. Hall, Black, and Graves (1982:474) define "horizons" as assemblages of materials from contiguous vertical excavation levels which may represent general periods of activity at the site. Generally, ". . . the definition of horizons in the sites serves only to differentiate 'older' and 'younger' cultural remains, a distinction based essentially upon the relative stratigraphic relationship of the horizons to one another" (**ibid.**). Amounts of material per individual level for the excavated units are provided in Appendix VII. The levels assigned to each horizon for Phase II vary slightly from those established by Hall for Phase I. Tables are presented for each horizon and include counts and weights of selected materials. Feature materials are not included in these tables but are provided with the feature

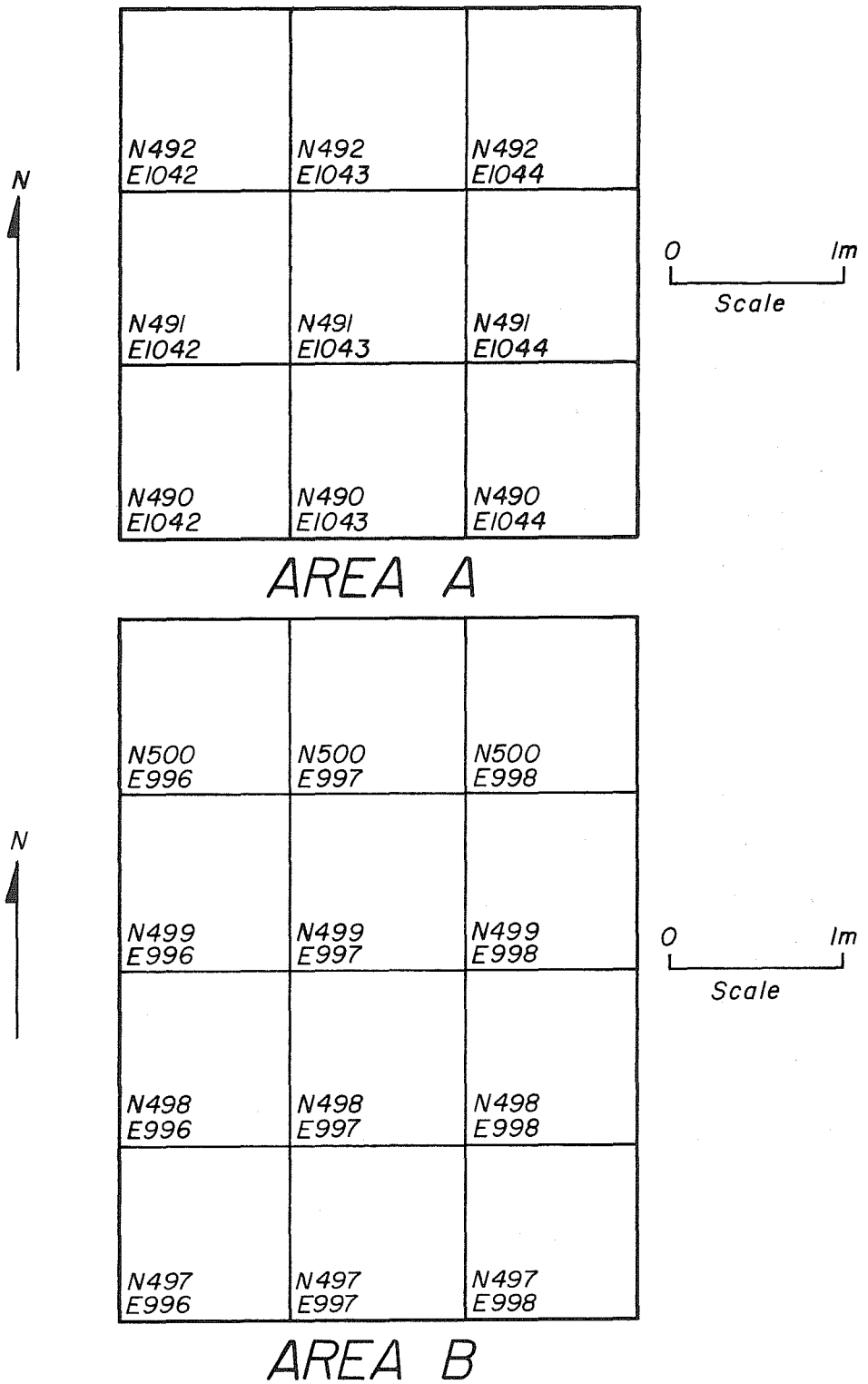


Figure 4. **Phase II Excavations: Unit Designations for Areas A and B.**

TABLE 1. VERTICAL DEPTH OF EXCAVATIONS AND SCREENING PROCEDURES FOR 41 LK 201, PHASE II

Area	Unit	1/4-Inch Mesh Dry	1/4-Inch Mesh Wet	1/8-Inch Mesh + Window Mesh Wet	Discarded Levels
A*	N490 E1042	Levels 1-3			
A	N490 E1043	Levels 1-8	Levels 9-10	Levels 11-19	
A	N490 E1044	Levels 1-8	Levels 9-19		
A	N491 E1042	Levels 1-3			
A	N491 E1043	Levels 1-6	Levels 7-19		
A	N491 E1044	Levels 1-6	Levels 7-20		
A	N492 E1042	Levels 1-3			
A	N492 E1043	Levels 1-3			
A	N492 E1044	Levels 1-3			
B*	N497 E996	Levels 1-8	Levels 10-18		9
B	N497 E997	Levels 1-8	Levels 10-18		9
B	N497 E998	Levels 1-9	Levels 10-18		
B	N498 E996	Levels 1-7	Levels 10-18		8-9
B	N498 E997	Levels 1-7	Levels 10-18		8-9
B	N498 E998	Levels 1-9	Levels 10-18		
B	N499 E996	Levels 1-7	Levels 10-18		8-9
B	N499 E997	Levels 1-7	Levels 10-18		8-9
B	N499 E998	Levels 1-9	Levels 10-18		
B	N500 E996	Levels 1-6	Levels 10-25		7-9
B	N500 E997	Levels 1-6	Levels 10-25		7-9
B	N500 E998			Levels 1-25	
C**	N510 E1020		Levels 1-8		
C	N510 E1021		Levels 1-8		
C	N510 E1022		Level 1		

* Areas A and B were excavated in 10-cm levels.
** Area C was excavated in 5-cm levels.

descriptions. Materials from Areas A and B were combined into horizon assemblages based on the following level groupings:

Horizon	1	2	3	4	5
Area A	Levels 1-5	6-9	10-14	15-19	--
Area B	Levels 1-5	6-9	10-13	14-18	19-25

Area C, consisting of three partially excavated units, was not treated in this manner and will be briefly discussed (see The Area C Excavations section).

THE AREA A EXCAVATIONS

During Phase I investigations at 41 LK 201, a unique and complex feature (Feature 2) was encountered in the lower levels of TP 3 (Hall, Black, and Graves 1982:74-78). The feature consisted of carbonized logs, burned rock, fired earth and clay, and ash. Found in and around the feature were small bone fragments, land snail shells, and mussel shell fragments. All identifiable carbon was oak; charcoal samples yielded a corrected radiocarbon date of 1300 B.C. (Hall, Black, and Graves 1982:78).

Because only a portion of this unique feature was exposed during Phase I, it was decided during Phase II investigations to place a block unit of excavations adjacent to and partially including the western half of TP 3 in order to encounter and further investigate the nature of Feature 2. The 3-m^2 block unit was designated Area A (Figs. 2 and 4). Recent construction of an earthen dike (by the USBR), approximately 10 m east of the site, had necessitated the removal of fill from the area of 41 LK 201. Therefore, the original ground surface in the vicinity of Area A had been disturbed by bulldozing to a depth of approximately 5 cm.

Horizon 1

Horizon 1 was represented by Levels 1-5 in the Area A excavations. In Units N490 E1044 and N491 E1044, TP 3 was relocated, emptied of fill, and mapped. Excavation of the upper levels of the entire block revealed that Late Prehistoric remains did not extend appreciably into this part of the site. The soil in the upper levels was a dark grayish brown, sandy matrix. The few diagnostics recovered were one **Perdiz** basal fragment and two potsherds. Vertebrate faunal remains recovered were unidentifiable bird, spiny lizard, unidentifiable snake, unidentifiable turtle, box turtle, mud turtle, unidentifiable artiodactyl, white-tailed deer, unidentifiable **Canis** sp., jackrabbit, cottontail rabbit, muskrat, and squirrel. Test Pit 3 was excavated from the original ground surface during Phase I, and no time-diagnostic artifacts were recovered from the upper six levels. Apparently the major area of Late Prehistoric occupation was concentrated west of Area A and nearer the slope adjacent to the slough.

The following amounts of selected materials were recovered:

	N490 E1042, N491 E1042, N492 E1042, N492 E1043, N492 E1044 (only Levels 1-3 excavated)	N490 E1043, N490 E1044, N491 E1043, N491 E1044 (Levels 1-5)
Tuff Weight (g)	30	231
Sandstone Weight (g)	82	92
Fire-Fractured Rock Weight (g)	202	550
Mussel Shell Umbo Count	35	76
Mussel Shell Weight (g)	227	475
Rabdotus Shell Count*	611+	707+
Bone Count	186	597
Bone Weight (g)	170	194
Ceramic Sherd Count	2	0
Biface Count	0	2
Core Count	0	2
Flake Count	36	75
Chip Count	22	40
Ground Stone Count	3	1

(* Snails were discarded in Levels 4 and 5.)

Horizon 2

Horizon 2, represented by Levels 6-9, generally showed a steady decrease in cultural debris. Although modified items of chipped stone are absent from these levels, one modified mussel shell fragment was recovered from Level 6 (98.25-98.15 m). The almost complete half was drilled near the umbo from the interior. A similar specimen was recovered from Area B at Level 6 (98.85-98.75 m). Vertebrate faunal remains recovered were unidentifiable bird, wild turkey, unidentifiable snake, unidentifiable turtle, box turtle, mud turtle, white-tailed deer, unidentifiable **Canis** sp., bobcat, jackrabbit, cottontail rabbit, cotton rat, and squirrel. The following selected materials were recovered:

Tuff Weight (g)	526
Sandstone Weight (g)	0
Fire-Fractured Rock Weight (g)	164
Mussel Shell Umbo Count	35
Mussel Shell Weight (g)	243
Modified Mussel Shell Count	1
Rabdotus Shell Count*	129+
Bone Count	284
Bone Weight (g)	321
Biface Count	0
Core Count	0
Flake Count	41
Chip Count	36
Ground Stone Count	0

(* Snails were discarded in Level 6.)

The soil was a dark brown, sandy matrix in Level 6; in Levels 7-9 the sandy soil became somewhat lighter in color with an increased clay content.

Horizon 3

Horizon 3 was defined for Levels 10-14. Amounts of cultural materials began to increase slightly in Level 10, became most abundant in Levels 11-13 (including Feature 5), and began to decrease again in Level 14. Particularly significant are the chipped stone dart points and tools (see Table 2), as

TABLE 2. CHIPPED STONE CORES AND BIFACES FROM AREA A, HORIZON 3*

Level	N490 E1043	N490 E1044	N491 E1043	N491 E1044
10	1 Core (Group 6) 1 Thin Biface (Group 2, Form 2) 1 Thin Biface (Group 9)	1 Core (Group 6) 1 Thin Biface (Group 1, Form 1)	1 Core (Group 3	1 Thick Biface (Group 2)
11	1 Core (Group 1) 1 Core (Group 2)	1 Core (Group 5)	1 Thin Biface (Group 1, Form 3) 1 Distally Beveled Biface (Group 3, Form 3)	1 Thin Biface (Group 4, Form 4)
12	1 Core (Group 2) 1 Core (Group 3)			
13		1 Thin Biface (Group 9) 1 Core (Group 1)		
14				1 Core (Group 2)

*Appendix II provides metric data for these specimens, illustration information is also provided for thin bifaces and distally beveled bifaces.

well as the increased amount of chipping debris. Tuff, mussel shells, and bone fragments are also significantly more abundant than in Horizon 2. One unusual item, a teardrop-shaped chunk of asphaltum, was recovered from Level 11. They clay content of the dark grayish brown, sandy alluvium began to increase in Level 12. Faunal remains recovered were catfish, unidentifiable turtle, white-tailed deer, jackrabbit, cottontail rabbit, wood rat, harvest mice, and cotton rat.

The following amounts of selected materials, excluding Feature 5 constituents, were recovered from Levels 10-14:

Tuff Weight (g)	2251
Sandstone Weight (g)	34
Fire-Fractured Rock Weight (g)	827
Mussel Shell Umbo Count	147
Mussel Shell Weight (g)	602
Rabdotus Shell Count	345
Bone Count	1007
Bone Weight (g)	143
Biface Count	8
Core Count	10
Flake Count	276
Chip Count	365
Ground Stone Count	1

Feature 5

Feature 5, an oval-shaped cluster of fire-fractured rock, was first encountered at the base of Level 12 (97.55 m) of Units N490 E1043 and N491 E1043 (Fig. 3,c); it continued into Level 13 (97.55-97.45 m) of both units (Fig. 3,d). Almost equal portions of the feature were present in each unit. The feature appeared to extend slightly into Units N490 E1042 and N491 E1042; however, the lower levels in these adjacent units were not excavated.

The feature was pedestaled as the surrounding portions of Levels 12 and 13 were excavated. The following is a list of the cultural debris recovered within the feature:

100	Tuff Weight (g)	18,760
17	Sandstone Weight (g)	1,154
1	Fire-Fractured Chert Weight (g)	172
1	Grooved Sandstone Weight (g)	77
1	Mano Weight (g)	139
6	Metate Fragments (fit together) Weight (g)	745
1	Flake Fragment	-
1	Mussel Shell Umbo and Fragments	12
	Charcoal Weight (g)	-
	Small Fired Clay Nodules	-

The long axis of Feature 5 was oriented northwest to southeast and was about 60 cm long; the northeast to southwest axis was about 34 cm long (Fig. 5). Constructed predominantly of tuff, the feature appeared to represent a single

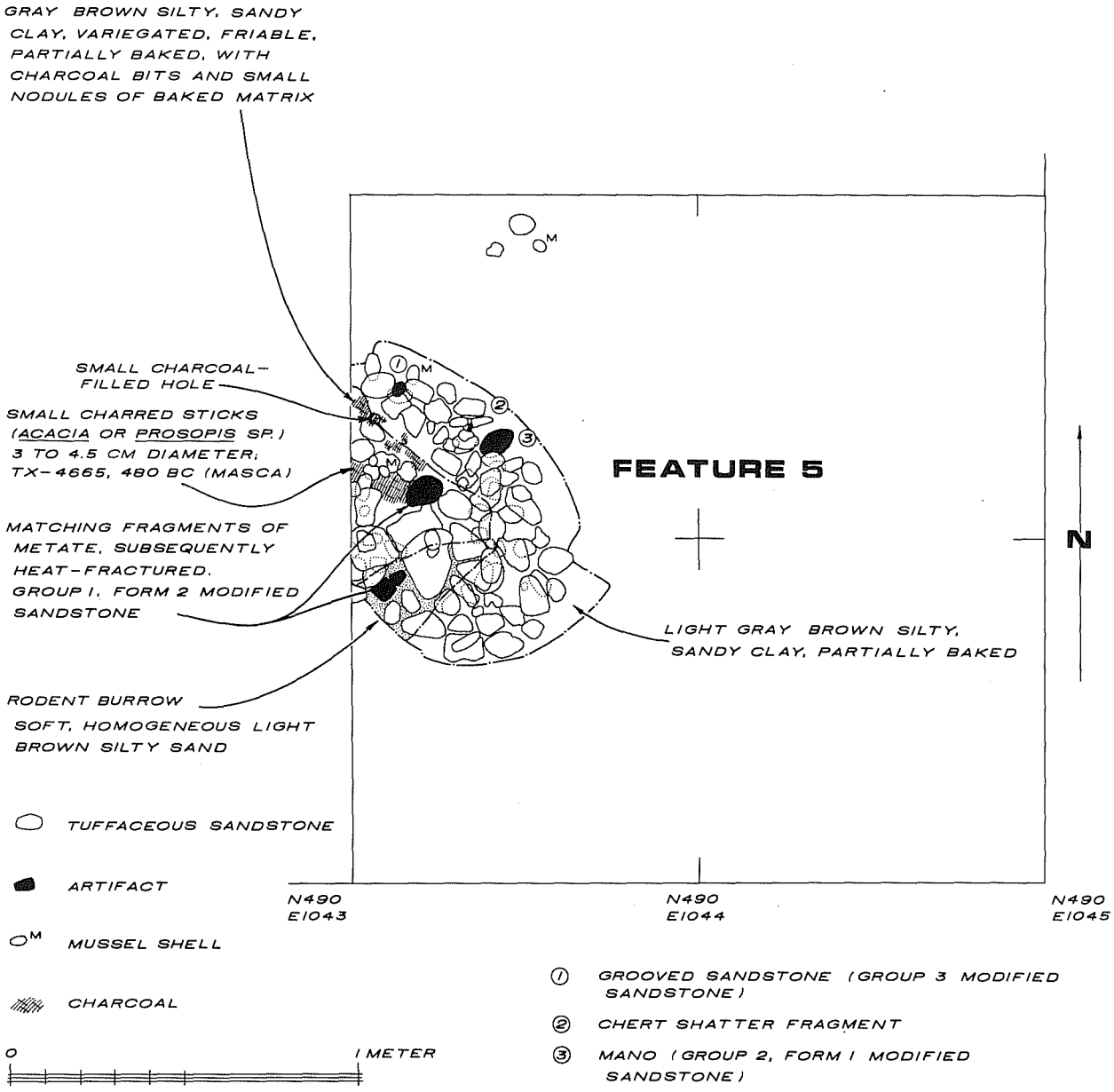


Figure 5. **Phase II Excavations: Plan of Feature 5, Area A, Level 13 (97.55-97.45 m).**

layer of rocks. However, in several instances rocks were stacked two or three deep; these, along with the rocks scattered around the feature, may have constituted a second layer. Rocks ranged in size from 3 to 20 cm in diameter.

The feature fill consisted of very dark brown, friable, silty clay that was partially baked, resulting in occasional inclusions of orange or buff-colored fired clay nodules. Ashen areas were noted in the center of the feature. Charcoal was confined to a small area on the northwestern end of the feature. Recovered from this area were several small "sticks" of carbonized wood, averaging 3 cm in diameter; the largest was 4.5 cm in diameter. The wood sample was identified as either **Acacia** sp. or **Prosopis** sp. (see Hall, Hester, and Black 1986:Appendix II). The baked clay matrix present within the feature was also noted around the outer edges of the hearthlike structure.

A small sample (1248 cm^3) of the matrix from Feature 5 was water screened through two U.S.A. Standard Testing Sieves. The heavy fraction was collected from a No. 12 sieve (Tyler Equivalent 10 mesh), while the light fraction was derived from a No. 35 sieve (Tyler Equivalent 32 mesh). The following items were present:

Heavy Fraction	Light Fraction
2 small burned flakes	<0.5 g small land snails
1 small burned chert chunk	<0.5 g mussel shell fragments
8 burned bone splinters (unidentified)	<0.5 g bone splinters
5 unburned bone splinters (unidentified)	<0.5 g charcoal flecks
1 small mussel shell umbo	
1 g mussel shell fragments	
1 g charcoal	
16 small land snails	

Very little of significance was present within the feature fill. Apparently, whatever was processed or baked within the feature was removed and eaten with the resulting debris (i.e., animal bone, mussel shell fragments) disposed of around the hearthlike structure (see Table 3) rather than being discarded into the burned rock structure. Substantial amounts of land snail shells, mussel shells, and bone were scattered around the feature. In Level 12 of Unit N491 E1044 approximately 40 mussel shells totaling 152 g were recovered primarily from the western half of the unit which places them outside, but near, the feature boundaries. Mussel shell quantities decreased in Level 13 of the surrounding units. Tuff and fire-fractured rocks occurred in large quantities in Level 12 of Unit N490 E1043 and in Level 13 of Unit N491 E1043. It should also be noted that 151 g of mussel shell and 244 fragments of bone totaling 17 g came from above the feature in Level 11 of Unit N490 E1043. Identifiable bones from around Feature 5 were identified as catfish, turtle, white-tailed deer, jackrabbit, cottontail rabbit, harvest mice, wood rat, and cotton rat.

A single radiocarbon date of 480 B.C. (MASCA corrected) was obtained for Feature 5. Two distinctive chipped stone artifacts were found in Level 11 of Unit N491 E1043 (this is the level above the one containing Feature 5). The artifacts are identified as a stemmed point (Group 1, Form 3, Specimen 21) which is missing portions of its diagnostic proximal end, but appears to be

TABLE 3. MATERIALS SURROUNDING FEATURE 5 IN AREA A, LEVELS 12 AND 13

Units	N490 E1043* Level 12	N490 E1044 Level 12	N491 E1043 Level 12	N491 E1044 Level 12	N490 E1043* Level 13	N490 E1044 Level 13	N491 E1043 Level 13	N491 E1044 Level 13	Total
Tuff Weight (g)	379	59	396	651	64	2	18	5	1574
Sandstone Weight (g)	0	0	0	12	0	0	0	0	12
Fire-Fractured Rock Weight (g)	108	2	287	56	46	17	2	1	519
Mussel Shell Umbo Count	17	4	25	40	6	4	0	2	98
Mussel Shell Weight (g)	58	18	61	152	7	9	4	3	312
Rabdotus Shell Count	29	134	8	7	20	11	5	7	221
Bone Count	335	5	13	12	174	0	5	29	573
Bone Weight (g)	35	1	4	2	12	0	1	12	67
Biface Count	0	1	0	0	0	0	0	0	1
Core Count	2	0	0	0	0	1	0	0	3
Flake Count	32	8	36	21	7	7	2	2	115
Chip Count	86	11	18	19	15	7	1	3	160

* Note: Unit 490 E1043 was fine screened through 1/8-inch screen; therefore, counts and weights for certain items (i.e., **Helicina** land snails, bone chips) may appear inflated when compared to the other units.

an **Ensor** point, one of the Late Archaic side-notched types, and a small, distally beveled biface (Group 3, Form 3, Specimen 1) of the **Nueces** scraper variety.

Horizon 4

Horizon 4 consists of Levels 15-19, and in the case of Unit N491 E1044, includes Level 20. The dark grayish brown loam has a high sand and clay content. Most significant in Horizon 4 is the remaining portion of Feature 2. Other portions of this feature had been uncovered in Phase I excavations. The amount of tuff, sandstone fragments, and fire-fractured rocks increased significantly in these levels. Preserved bone, still in fairly large quantities, continued into these lower levels, while the amount of mussel shells and land snail shells was less than in Horizon 3. Vertebrate faunal remains recovered were unidentifiable turtle, unidentifiable artiodactyl, bison, white-tailed deer, badger, cottontail rabbit, and cotton rat. Chipped stone items recovered were one thick biface (Group 3) and five cores. The following selected materials were recovered from Levels 15-19:

Tuff Weight (g)	3961
Sandstone Weight (g)	268
Fire-Fractured Rock Weight (g)	1651
Mussel Shell Umbo Count	52
Mussel Shell Weight (g)	269
Rabdotus Shell Count	154
Bone Count	434
Bone Weight (g)	185
Biface Count	1
Core Count	5
Flake Count	55
Chip Count	32
Gypsum Rod Count	1

Feature 2

Feature 2, encountered in TP 3 of the Phase I excavations, was relocated at the base of Level 15 (97.25 m) in the eastern half of Unit N490 E1043 (Figs. 6-8). Taking into account that 5 cm of surface soil had been removed by bulldozing, Feature 2 occurs 1.55 m below the ground surface as was the case in Phase I. The feature appeared as an irregularly shaped darker area with small, orange-fired clay inclusions and small chunks of wood charcoal (Fig. 3,e). The entire 2-m^2 block was troweled down to Level 15. The top of the feature appeared confined to Units N490 E1043 and N490 E1044. A darker central area, referred to as the "central pit," was surrounded by a mottled, gray brown, sandy, silty clay with slight caliche webbing (Fig. 3,f). Very small orange and black clay nodules were present in this outer zone as were occasional **Rabdotus** snails, one concentration of small animal bones, and charcoal. A concentration of mussel shell was located west of Unit N490 E1043 outside of Feature 2 (Figs. 7; 9,a).

The feature and the surrounding 2-m^2 area were excavated simultaneously level by level beginning with Level 16. Level 17 (97.15-97.05 m) was removed from

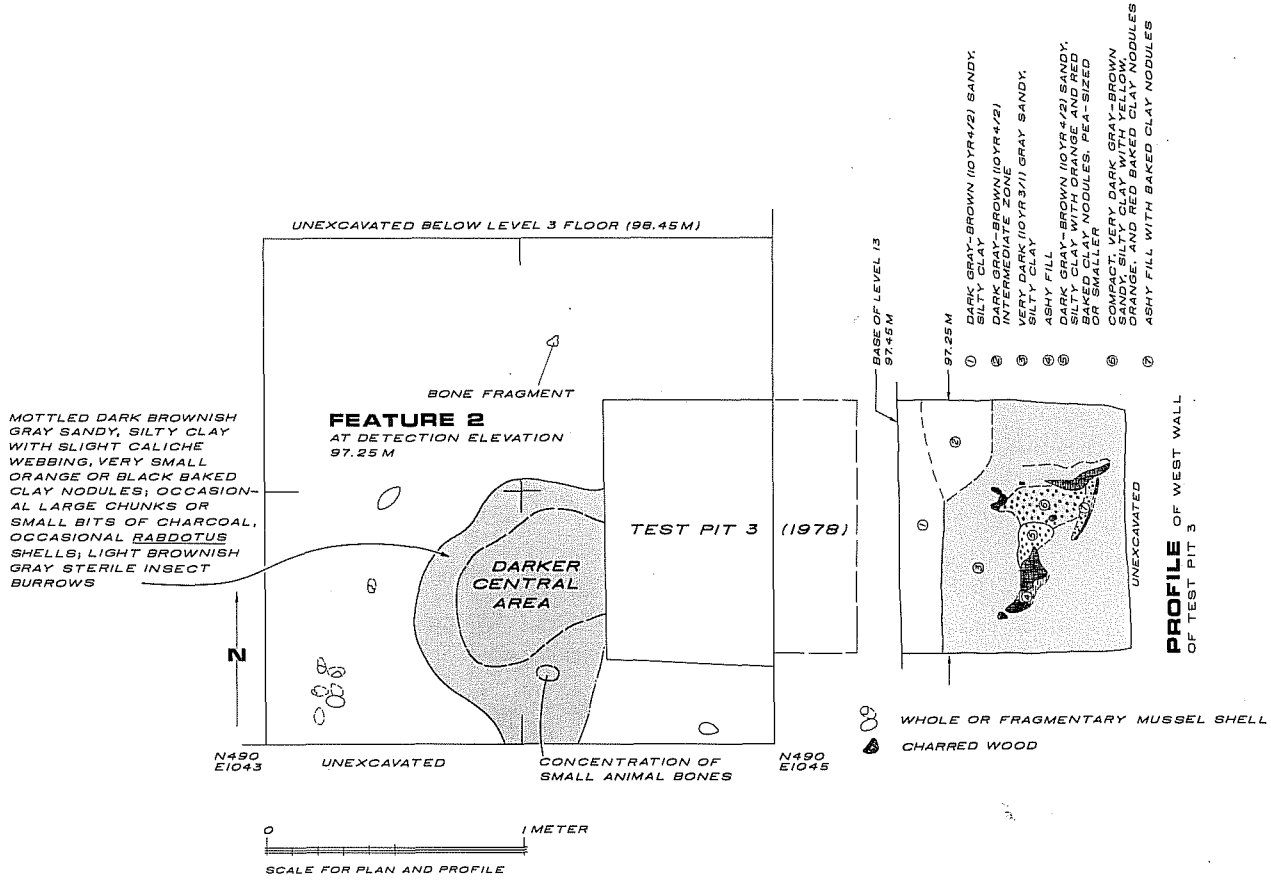


Figure 6. **Feature 2 as it Appeared at Detection Elevation in the 1980 Area A Excavations and in the 1978 Test Pit.** The areas mapped in the block excavation and the test pit are at slightly different elevations because the excavation levels do not correspond exactly; the exact difference is unknown because the elevation of the test pit datum was not recorded in 1978, but it amounts to only a few centimeters. The profile shown was drawn in 1980 and therefore differs slightly from the version shown in Hall, Black, and Graves (1982:Fig. 14).

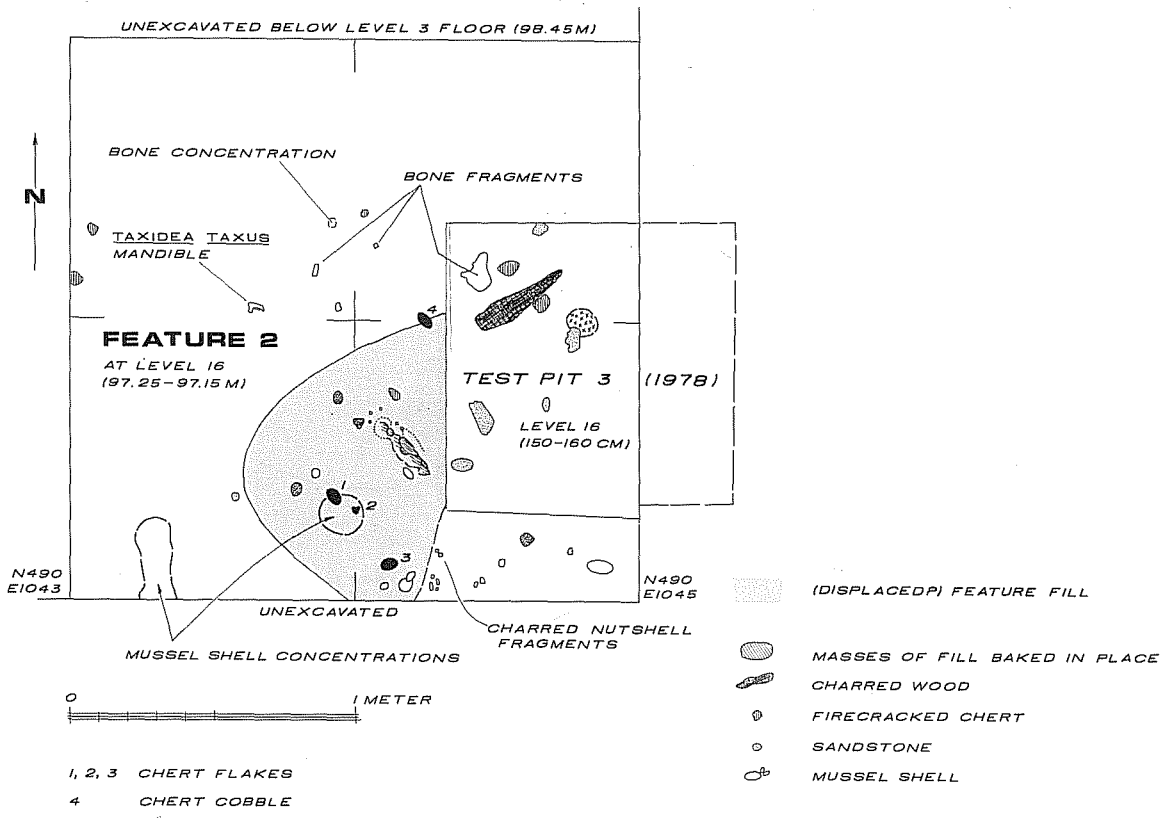


Figure 7. **Phase II Excavations: Plan of Feature 2, Area A, Level 16 (97.25-97.15 m).**

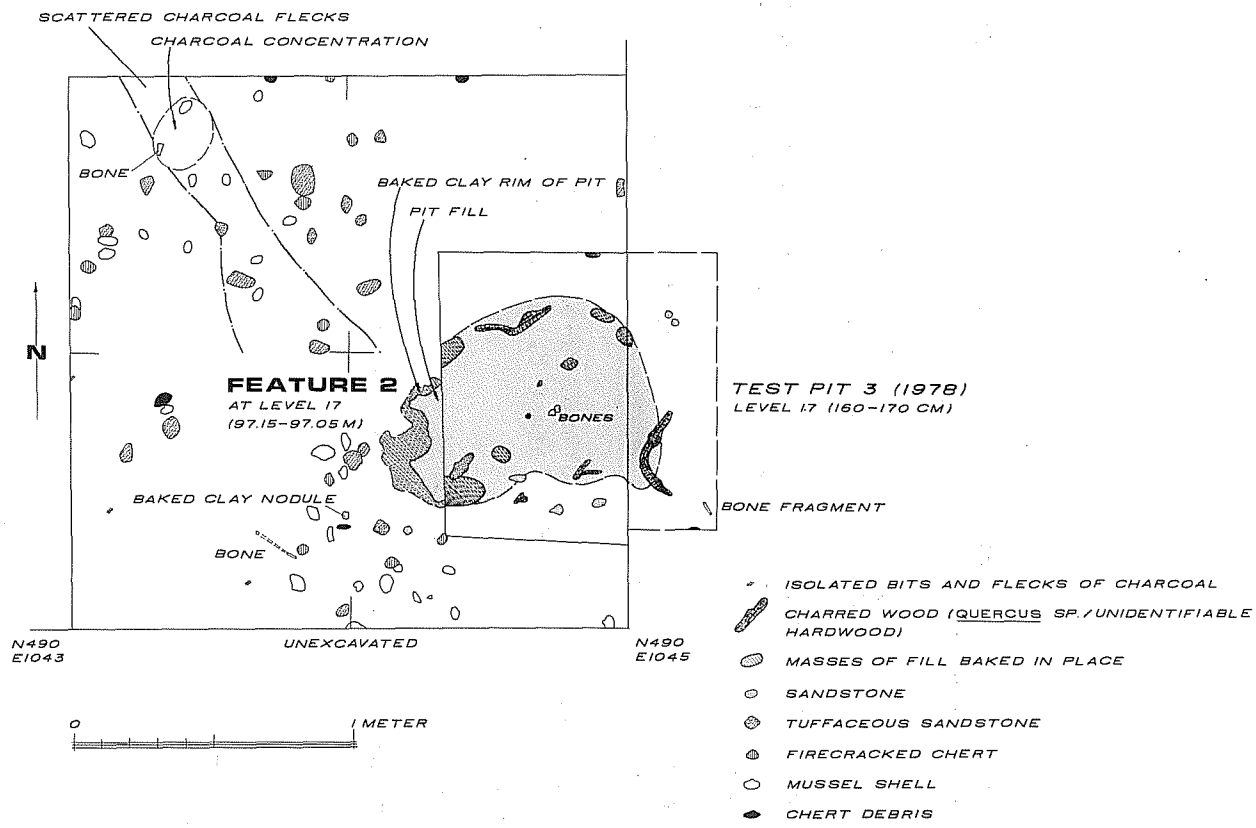


Figure 8. **Phase I and Phase II Excavations: Feature 2 at Level 17 (97.15-97.05 m).**

Figure 9. **Phase II Excavations: Area A, Feature 6 and Area B, Features 6, 7, 8, and 9.**

a, Feature 2, fired clay walls in center with mussel shells and tuffaceous rock located west of hearth;

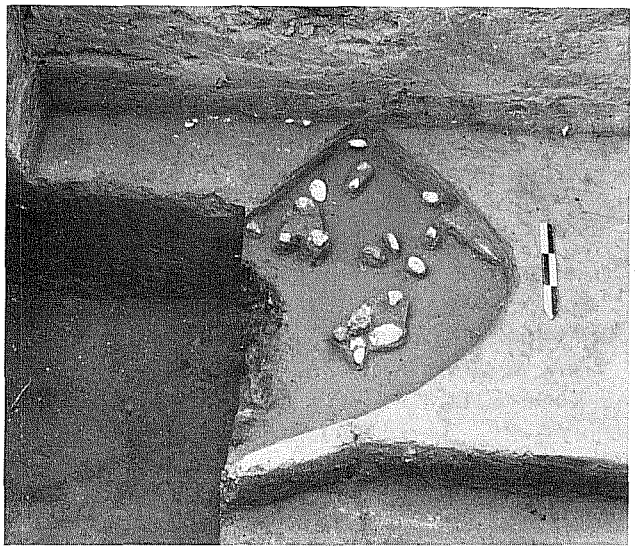
b, Area B, **Rabdotus** concentration exposed at Level 3 (99.25 m). White triangles indicate **Perdiz** arrow points; animal bone is also present;

c, Area B, profile of Feature 6, view east. A shallow, oblong basin remained after fill was removed;

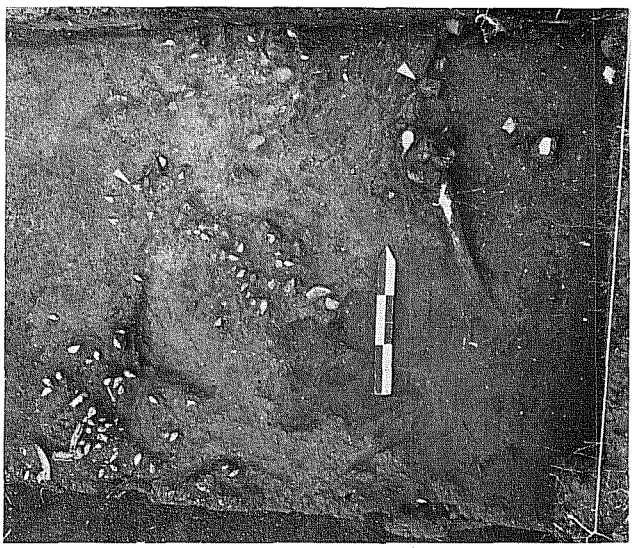
d, Area B, Features 7 and 8. Crescent-shaped Feature 7 is on floor of Level 15 (97.85 m); Feature 8, along northern wall, is on Level 16 (97.75 m);

e, Area B, Feature 8, view north;

f, Area B, Feature 9, exposed in west wall profile.



a



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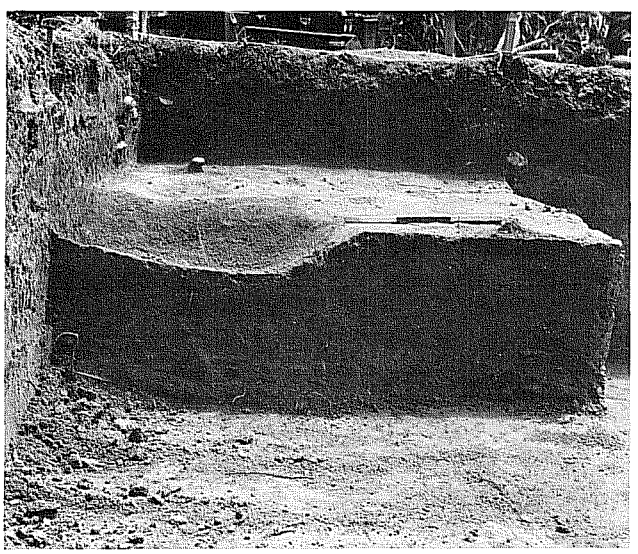

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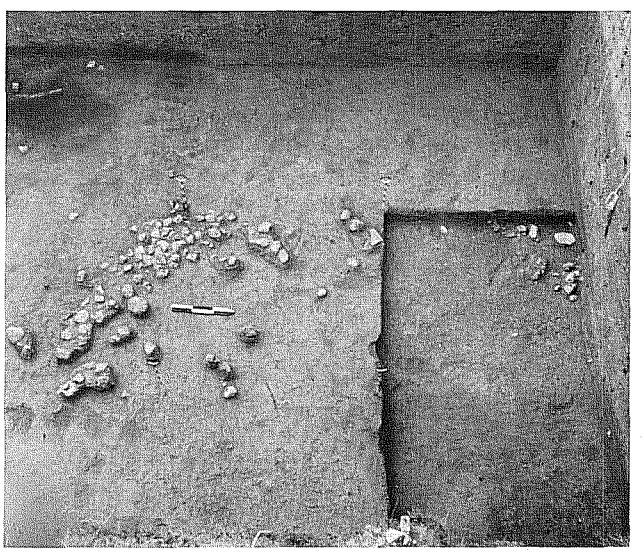

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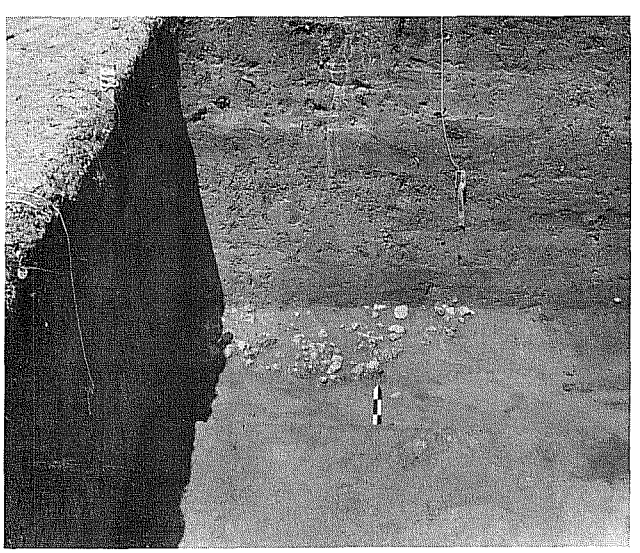

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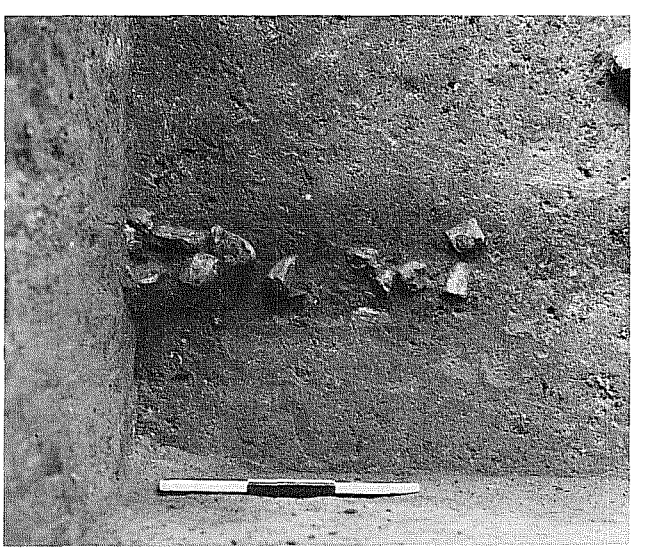


f

the "central pit," exposing fired clay walls in place (Fig. 8). The walls were very irregular, varying in color from light gray to light orange and in hardness from well indurated to softer areas that merged with fill. A few snails, bone fragments, mussel fragments, and small fired clay nodules were noted in the fill (Fig. 7). A large area of charcoal occurred along the southern edge of the "central pit."

The zone surrounding the "central pit" was designated the "main pit," and during this stage of excavation was considered to be part of Feature 2. This area had a dark gray brown soil matrix containing a high sand and silt content. A large number of tuffaceous sandstone, burned chert, and mussel shell fragments were uncovered; however, they occurred at the same level as similar materials in Units N491 E1043 and N491 E1044. This suggested that the outer zone might not be part of Feature 2. The stained area, which defined the limits of the main pit, could not be determined at the base of Level 17 (97.05 m).

The basal level of the "central pit" was located in Level 18 (97.05-96.92 m). It was dug to the lowest point exposed in the west wall of TP 3 (approximately 96.92 m). The fill was similar to Level 17 but contained more ash and charcoal, including localized ash pockets. The fill contained charcoal, fired clay, several bone splinters, and a few small snails. As was the case in Level 17, the outline of the "main pit" could no longer be determined, although remnants of the fired clay walls of the "central pit" persisted immediately adjacent to the west wall of TP 3.

It was eventually determined that the "main pit" or outer zone surrounding the "central pit" was not part of Feature 2 but appeared to be a heavily charcoal-stained area created by disturbance of the "central pit" which was the remaining portion of Feature 2. The scatter of debris outside of the baked clay-lined "central pit" looked identical in composition and elevation to that found in adjacent units. This suggests that the material outside of the "central pit" (Feature 2) was part of a continuous debris scatter disturbed by Feature 2. The following is a list of the feature constituents:

	Level 16	Level 17	Level 18
Tuff Count	3	4	0
Tuff Weight (g)	52	320	0
Sandstone Count	1	4	0
Sandstone Weight (g)	44	45	0
Fire-Fractured Rock Count	7	18	0
Fire-Fractured Rock Weight (g)	153	293	0
Burned Clay Count	44	65	4
Burned Clay Weight (g)	4	358	2
Mussel Shell Umbo Count	0	8	0
Mussel Shell Umbo Weight (g)	7	66	0
Rabdotus Shell Count	16	3	0
Bone Count	59	26	0
Bone Weight (g)	3	2	0
Core Count	1	0	0
Flake Count	1	1	0
Chip Count	4	0	0

Level 17 contained the greater quantities of tuff, sandstone, and fire-fractured rock. As was the case with Feature 5, small quantities of mussel shell and bone were encountered within the feature fill with larger quantities present in the zone around the feature. The bone fragments recovered from Feature 2 were not identifiable, but turtle, deer, bison, white-tailed deer, badger, rabbit, and rodent bones were recovered from Horizon 4 and may have been processed in Feature 2. Carbonized wood samples were identified as mesquite (**Prosopis** sp.; see Hall, Hester, and Black 1986:Appendix II).

Feature 2, a pit in which an intense fire was built, probably functioned as a specialized cooking facility (Hall, Black, and Graves 1982:80). The presence of mussel shell and animal bone within the immediate area suggests that these items were cooked in the pit. Vegetal foods could also have been baked in this feature.

All four units were excavated through Level 19 (96.95-96.85 m) which contained a light scatter of chipping debris, mussel shell, land snail shells, and charcoal. Level 20 (96.85-96.75 m) was also excavated in Unit N491 E1044 and was nearly sterile.

THE AREA B EXCAVATIONS

Area B was initially set up as a 3-m^2 block unit. This area was later expanded by adding three 1-m^2 units along the northern end of the block. Although the original ground surface of the northwestern corner of Unit N499 E996 had been disturbed to a depth of approximately 20 cm by backfilling operations in 1978, the remainder of this area appeared undisturbed.

Horizon 1

Levels 1-5 represent Horizon 1. Unlike Area A, Area B contained a concentrated Late Prehistoric assemblage, including potsherds and many **Perdiz** points. The pottery occurred in the upper five levels; the arrow points were generally found in the upper three levels. Other materials recovered from the first five levels were small unifacial end scrapers, thin bifaces, cores, ground stone items, a bone bead, modified marine shell, bison and other bone, mussel shells, land snails, and chipping debris. Because of the large quantities of materials present in this upper horizon, Table 4 will present weights and counts for selected items per unit.

A large concentration of **Rabdotus** snail shells was exposed in Level 3 (at 99.15 m) of Units N498 E997, N498 E998, N499 E997, and N499 E998 (Figs. 9,b; 10). The concentration, with a maximum thickness of approximately 20 cm, extended to just below the top of Level 4 (99.05 m). The major concentration measured approximately 1 x 1.5 m across, but additional snails scattered over the surrounding area comprised a total area of 1.5 x 3 m. A metate fragment was recovered from the center of the concentration.

The northernmost limits of the snail concentration were uncovered in Units N500 E997 (southeastern corner) and N500 E998 (western half) at the base of

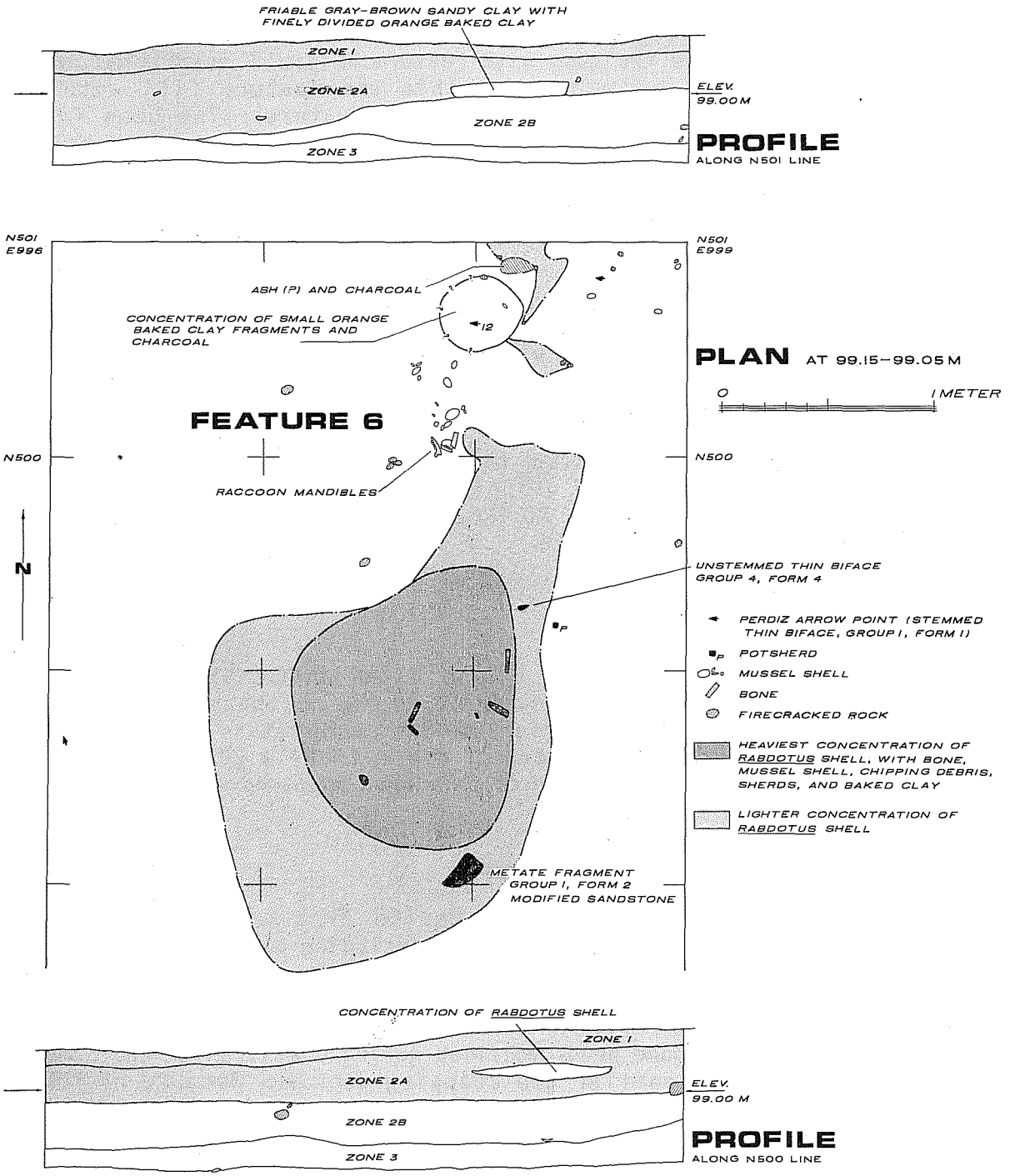


Figure 10. **Phase II Excavations: Plan and Profile of Feature 6, Area B, Level 4 (99.15-99.05 m).**

TABLE 4. CULTURAL MATERIALS FROM AREA B, HORIZON 1 (LEVELS 1-5)

Units	N497 E996	N497 E997	N497 E998	N498 E996	N498 E997	N498 E998	N499 E996	N499 E997	N499 E998	N500 E996	N500 E997	N500* E998	Total
Tuff Weight (g)	161	14	44	3	115	74	309	678	477	243	454	168	2740
Sandstone Weight (g)	4	54	0	38	186	10	5	16	14	109	321	31	788
Fire-Fractured Rock Weight (g)	184	356	322	265	543	465	396	350	430	691	276	535	4813
Mussel Shell Umbo Count	53	47	40	61	68	130	104	67	80	45	65	53	813
Mussel Shell Weight (g)	264	248	199	288	533	368	678	507	574	305	419	345	4728
Modified Mussel Shell Count	0	0	0	0	0	0	0	1	0	0	0	0	1
Rabdotus Shell Count	313	421	317	530	1621	701	569	1666	1352	175	296	410	8371
Bone Count	95	48	75	34	181	133	24	113	161	21	56	1072	2013
Bone Weight (g)	59	56	71	20	155	188	30	98	88	10	47	58	880
Marine Shell Count	0	0	0	0	0	2	0	2	0	0	0	0	4
Ceramic Count	1	3	0	0	0	0	0	0	1	0	1	3	9
Perdiz Point Count	0	1	0	2	3	0	0	2	2	0	1	3	14
Thin Biface Count	3	2	1	2	7	3	4	11	4	1	2	12	52
Thick Biface Count	1	0	0	1	1	0	1	3	0	0	0	0	7
Core Count	0	0	0	2	1	0	2	0	0	0	1	2	8
Flake Count	59	126	77	95	183	148	76	197	99	52	168	1557	2837
Chip Count	80	151	219	96	265	284	93	272	384	57	141	2770	4812
Ground Stone Count	0	0	1	0	0	0	0	3	0	3	1	1	9

* Fine screen unit

Level 2 (99.15 m). Two **Perdiz** points, animal bone, and a cluster of flakes were mapped **in situ** (Fig. 9,b). A charcoal and ash deposit was located near one of the localized snail concentrations in the northwestern corner of Unit N500 E998. Charcoal was noted throughout both units, and a charcoal sample from Level 3 produced a radiocarbon date of A.D. 1470-1500 (MASCA corrected). There was no discernible soil change between or within Levels 2 and 3 which might indicate a pit containing the snail concentration.

The greatest amounts of tuff and sandstone were found in Level 3 in the units containing **Rabdotus** concentrations (see Table 4). Fire-fractured chert increased considerably in Levels 3 and 4, with greater amounts occurring in the northwestern units in and around the snail concentration. Mussel shells, flaking debris, and animal bone were also in greatest quantities near the snail concentration. Animal species identified were gar, catfish, freshwater drum, alligator, unidentifiable snake, unidentifiable turtle, box turtle, unidentifiable artiodactyl, bison, white-tailed deer, peccary, raccoon, armadillo, jackrabbit, cottontail rabbit, wood rat, pocket mouse, cotton rat, and squirrel.

Feature 6

In Unit N500 E998, Feature 6, an area of reddish orange burned earth, was first encountered at the top of Level 4 (Fig. 10). The feature was approximately 30 cm in diameter and was 7 cm deep. No large burned rocks were near the feature. The feature components were as follows:

	N500 E998 Level 4	N500 E998 Level 5
Fire-Fractured Rock Count	40	7
Fire-Fractured Rock Weight (g)	35	31
Burned Clay Count	54	9
Mussel Shell Count	5	4
Mussel Shell Weight (g)	44	23
Rabdotus Snail Count	68	21
Bone Count	67	9
Bone Weight (g)	2	1
Flake Count	110	5
Chip Count	96	4

The clay fragments average 1 to 6 mm in diameter. Associated with this burned area were mussel shells, a few land snails, bone, flakes, and carbon. A shallow, oblong basin remained after the fill was removed (Fig. 9,c). It is assumed that a scattering of mussel shells, most resting convex side up, located in the southeastern corner of Unit N500 E997 and in the southwestern corner of Unit N500 E998, is associated with this ovenlike feature. The **Rabdotus** snails in the previously mentioned concentration might also have been processed in the feature.

Horizon 2

Levels 6-9, defined as Horizon 2, continued to show a decrease in cultural materials. Only a few flakes, mussel shell fragments, and land snail shells were recovered. Animal bone elements recovered from these levels represent catfish, unidentifiable bird, unidentifiable turtle, pygmy mice, pine vole, harvest mice, cotton rat, and squirrel. The soil was dark brown, silty, and clayey. Because several lower levels proved to be relatively sterile in several units, the decision was made to discard several levels without screening (see Table 1). Several large flakes, tuffaceous rocks, and mussel shells were noted in the discarded soil from these levels but not in significant quantities. Rates of recovery of cultural materials for screened levels are presented in Table 5.

Even though Unit N500 E998 was the fine screen control unit, generally resulting in greater recovery, the amount of cultural debris in Levels 6-9 was less than in previous levels. A **Morhiss** dart point (Group 1, Form 2, Specimen 7) was recovered from these levels.

Horizon 3

Levels 10-13 represent Horizon 3. The soil was light brown sandy clay. Greater quantities of tuff, mussel shells, land snail shells, and bone were present in Level 10 than in the previous levels of Horizon 2 (Table 6). Elements of catfish, freshwater drum, unidentifiable bird, unidentifiable turtle, Texas tortoise, unidentifiable artiodactyl, peccary, jackrabbit, cottontail rabbit, pocket mouse, pine vole, and cotton rat were recovered. Chipped stone and ground stone items recovered from Level 10 are a distally beveled biface; a small, wedge-shaped mano fragment; and a small, unidentifiable ground stone fragment. Cultural materials, particularly fire-fractured rock, mussel shells, and flaking debitage, continued to increase in Levels 11-13, with Level 13 most productive (see Table 6). Three additional distally beveled bifaces were recovered in Levels 11 and 13. Identifiable dart points were noticeably absent from these levels, although several distal fragments are well made and appear to be dart point fragments. Amounts of selected cultural materials are displayed in Table 6.

Horizon 4

Levels 14-18 represent Horizon 4. Amounts of cultural materials decreased in Level 14 compared to previous levels; however, in Levels 15 and 16 several hearthlike features were revealed. Materials recovered from Levels 14-18 (excluding feature materials) consist of tuff, sandstone, fire-fractured rock, mussel shells, land snail shells, bone, and chipping debris (see Table 7). Animal bones recovered represent unidentifiable bird, jackrabbit, and cotton rat. The soil was a gray brown clayey silt.

TABLE 5. CULTURAL MATERIALS FROM AREA B, HORIZON 2 (LEVELS 6-9)*

Units	N497 E996	N497 E997	N497 E998	N498 E996	N498 E997	N498 E998	N499 E996	N499 E997	N499 E998	N500 E996	N500 E997	N500** E998	Total
LEVEL	6-8	6-8	6-9	6-7	6-7	6-9	6-7	6-7	6-9	6	6	6-9	
Tuff Weight (g)	24	10	260	56	173	635	128	101	169	15	6	56	1633
Sandstone Weight (g)	238	0	0	102	0	33	41	23	117	1	0	117	672
Fire-Fractured Rock Count	175	401	60	83	134	23	76	10	72	42	1	50	1127
Mussel Shell Umbo Count	20	8	34	7	13	30	12	15	23	7	9	28	206
Mussel Shell Weight (g)	151	61	191	69	86	142	81	64	174	22	26	167	1234
Modified Mussel Shell Count	0	0	0	0	0	0	0	0	0	0	0	1	1
Rabdotus Shell Count	85	36	314	23	15	64	22	10	44	14	22	163	812
Bone Count	5	0	4	2	0	4	2	0	3	0	2	143	165
Bone Weight (g)	3	0	2	1	0	3	2	0	2	0	1	5	19
Biface Count	0	0	0	0	0	0	0	0	0	0	0	1	1
Core Count	0	0	1	0	0	0	0	0	0	0	0	2	3
Flake Count	7	9	20	5	0	14	2	10	4	1	5	37	114
Chip Count	7	6	8	2	2	9	3	3	6	6	3	38	93
Ground Stone Count	0	0	1	0	0	0	0	0	0	0	0	0	1

* Several levels discarded; see Table 1
** Fine screen unit

TABLE 6. CULTURAL MATERIALS FROM AREA B, HORIZON 3 (LEVELS 10-13)

Units	N497 E996	N497 E997	N497 E998	N498 E996	N498 E997	N498 E998	N499 E996	N499 E997	N499 E998	N500 E996	N500 E997	N500* E998	Total
Tuff Weight (g)	621	679	960	845	934	705	619	944	604	282	397	511	8101
Sandstone Weight (g)	314	41	66	111	278	60	131	34	0	141	0	97	1273
Fire-Fractured Rock Weight (g)	390	194	65	366	118	142	209	53	9	119	64	37	1766
Mussel Shell Umbo Count	62	63	96	26	177	124	83	146	71	64	109	58	1079
Mussel Shell Weight (g)	111	105	280	65	306	233	104	272	128	126	146	86	1962
Modified Mussel Shell Count	0	0	1	0	0	0	0	0	0	0	0	0	1
Rabdotus Shell Count	123	76	232	121	96	158	165	58	61	72	80	213	1455
Bone Count	11	46	24	13	34	12	18	11	10	4	8	199	390
Bone Weight (g)	6	11	16	3	3	4	5	3	6	2	1	10	70
Thick Biface Count	0	0	0	0	1	0	0	0	1	0	0	0	2
Thin Biface Count	1	0	0	1	0	1	0	1	0	2	0	0	6
Distally Beveled Biface Count	0	2	0	1	0	0	0	0	0	0	0	1	4
Core Count	0	1	2	4	0	1	0	0	0	1	2	0	11
Flake Count	41	43	37	39	17	21	57	35	18	82	41	66	497
Chip Count	56	47	46	34	28	21	109	38	19	24	32	66	520
Ground Stone Count	1	2	0	2	2	0	0	1	0	0	0	0	8

* Fine screen unit

TABLE 7. CULTURAL MATERIALS FROM AREA B, HORIZON 4 (LEVELS 14-18)

Units	N497 E996	N497 E997	N497 E998	N498 E996	N498 E997	N498 E998	N499 E996	N499 E997	N499 E998	N500 E996	N500 E997	N500* E998	Total
Tuff Weight (g)	1782	2801	2569	2001	1728	2343	2414	1856	2108	3548	2162	1833	27,145
Sandstone Weight (g)	240	384	914	284	459	632	182	132	200	42	122	94	3685
Fire-Fractured Rock Weight (g)	1399	1221	932	714	929	514	1107	812	526	409	428	200	9191
Mussel Shell Umbo Count	13	20	15	10	15	24	15	16	13	10	9	19	179
Mussel Shell Weight (g)	22	46	50	26	41	60	42	61	56	26	26	74	530
Rabdotus Shell Count	313	625	476	361	507	342	333	374	356	315	364	942	5308
Bone Count	5	9	8	9	24	14	21	12	44	5	23	162	336
Bone Weight (g)	2	3	3	3	8	5	9	3	83	1	9	14	143
Thick Biface Count	0	0	0	0	0	0	1	0	0	0	1	0	2
Thin Biface Count	0	1	1	1	0	0	0	1	0	0	0	0	4
Uniface Count	0	0	0	0	0	0	0	0	0	0	0	0	0
Core Count	0	1	0	4	2	0	0	1	1	0	1	1	11
Flake Count	15	27	27	60	29	34	56	23	19	32	29	40	391
Chip Count	11	22	47	30	64	62	77	65	31	29	34	15	487
Ground Stone Count	1	0	0	2	0	0	1	0	0	2	0	0	6

* Fine screen unit

Feature 7

In Level 15 (97.95-97.85 m), Feature 7 was uncovered in Unit N498 E997 with a small portion extending northward into Unit N499 E997. Several other burned rocks observed in adjacent units may also have been part of this feature. The crescent-shaped concentration of tuffaceous rock and fire-fractured rock rests on and slightly above the floor of Level 15 (Figs. 9,d; 11). In Unit N498 E997, a band of rocks approximately 40-cm wide runs diagonally (northwest to southeast) across the unit. It is approximately one meter in length. The feature materials include the following.

	N498 E997	N499 E997
Tuff Count	37	21
Tuff Weight (g)	536	556
Sandstone Count	2	0
Sandstone Weight (g)	36	0
Fire-Fractured Rock Count	47	11
Fire-Fractured Rock Weight (g)	483	214
Mussel Shell Umbo Count	1	0
Mussel Shell Weight (g)	17	0
Rabdotus Count	8	0
Bone Count	3	0
Bone Weight (g)	1	0
Core Count	1	0
Flake Count	1	2
Ground Stone Count	0	2

The layer of rocks was segregated into two groups. The southeast portion was composed primarily of tuffaceous rocks. Fire-fractured rock was concentrated near the northwestern end. Charcoal was present throughout the feature in small amounts; either **Acacia** sp. and/or **Prosopis** sp. was identified (Hall, Hester, and Black 1986:Appendix II). A grinding slab fragment was located near the northern end.

This feature bears many similarities to Feature 5 located in Area A. Both were oriented northwest to southeast, and both are about the same length, except Feature 5 is wider. The increased amount of burned rock in Level 14 of the southern and central portion of Area B may indicate that the upper portion of Feature 7 actually began in Level 14. Both features also contained ground stone fragments. Although mussel shells were found in Feature 7, they do not occur in as great a quantity as in Feature 5. The top of Feature 5 was approximately 1.10 m below the ground surface; the top of Feature 7 was approximately 1.45 m below the ground surface.

Feature 9

Feature 9 was uncovered in the western portion of Unit N497 E996 at Level 15 (97.95-97.85 m) and extends into Level 16 (97.85-97.75 m). It also extends into the unexcavated western wall of the excavation block (Figs. 9,f; 12). The feature rocks composing the hearth were not extensively heat fractured. The shallow, basin-shaped feature measured 84 cm in length and 49 cm in width

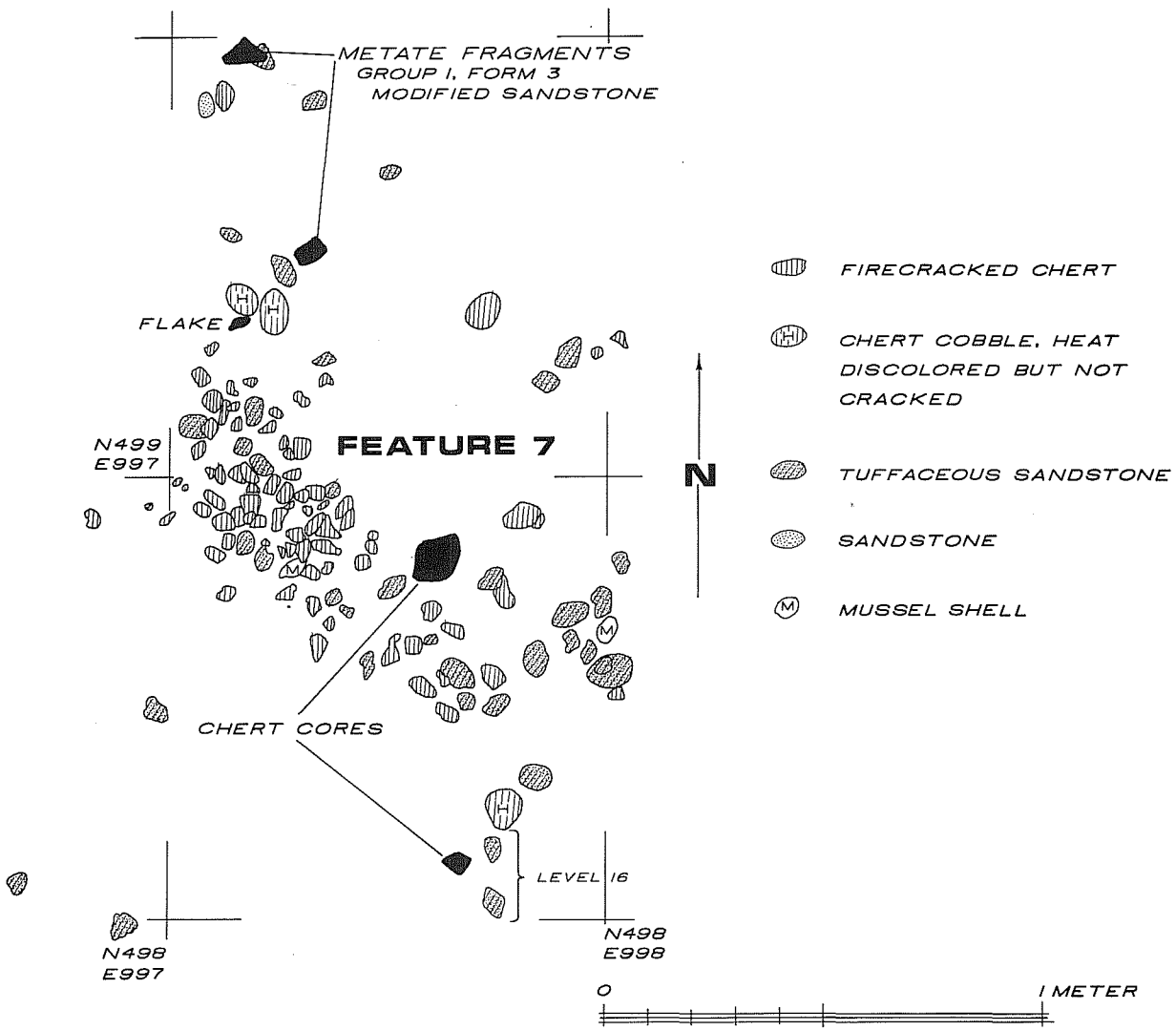


Figure 11. **Phase II Excavations: Plan of Feature 7, Area B, Level 15 (97.95-97.85 m).**

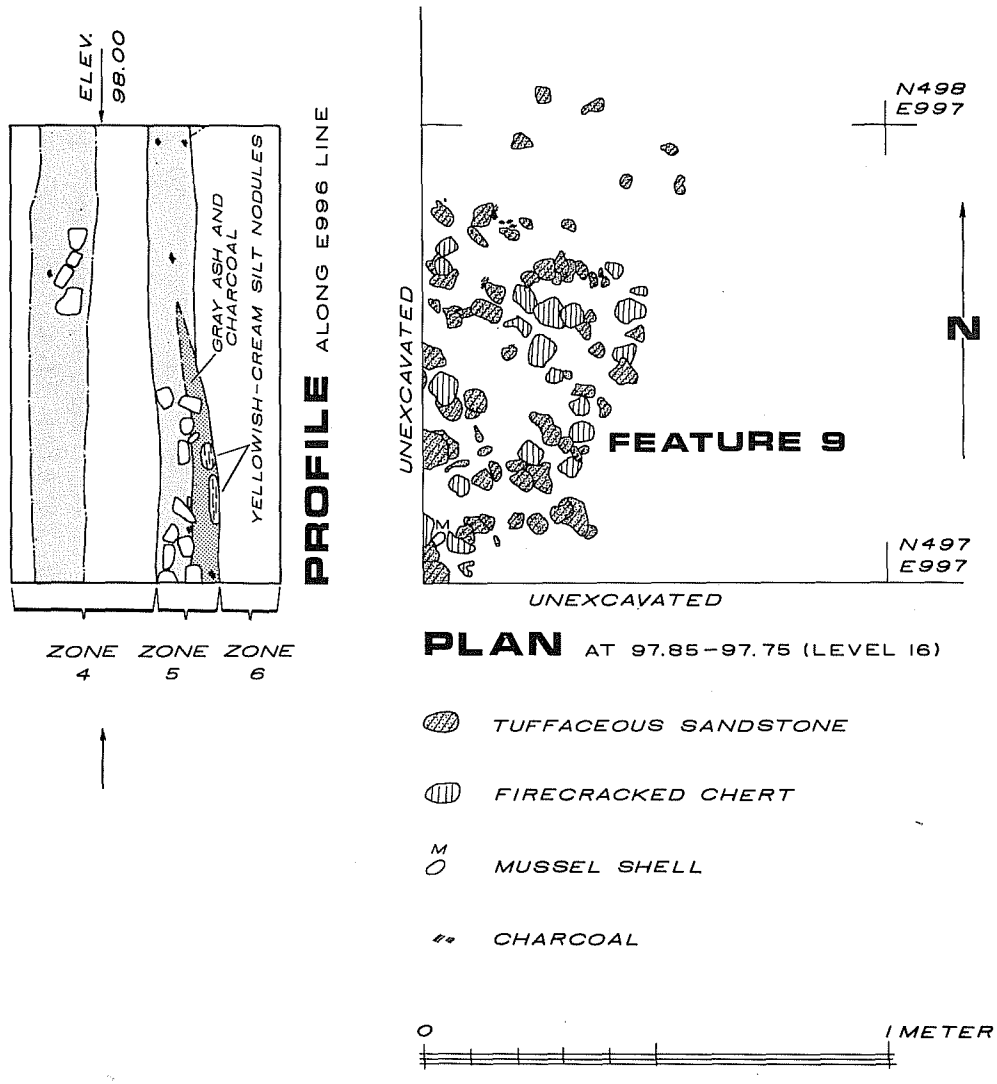


Figure 12. **Phase II Excavations: Feature 9 in Area B, Profile and Plan.** Feature 9, a cluster of fire-cracked tuffaceous sandstone and chert, about half of which remains unexcavated in the west wall of the Area B excavation block. Six small thermally altered petrified wood(?) fragments are included but are not distinguished from the chert on the plan.

and appears to have a northeast to southwest axis (Fig. 13,a). The components of the hearth were as follows: one sandstone fragment (55 g), 29 tuff fragments (1453 g), and 138 fire-fractured rocks (5458 g). Several mussel shells and a few pieces of burned bone were found in and around the feature.

The soft, dark grayish brown silt contained clusters of fired clay fragments. Ash and charcoal were spread throughout the feature. A few unidentifiable animal bone fragments were also uncovered. Materials recovered from the fine screen were small bones (unidentifiable), a few land snail shells, flakes, and charcoal.

Feature 8

Feature 8 was located in Units N500 and E996 and N500 E997 and appeared to extend into the northern unexcavated area (Fig. 9,e). The bottom of the feature was located near the floor of Level 16 (97.75 m) and extended into the upper portion of Level 17 in Unit N500 E996. Most of the exposed part, a scattering of tuff, was located in Unit N500 E996 (Fig. 14). The feature was not a tight concentration of rocks. The exposed semicircular portion measured approximately 125 cm along the east to west axis (Fig. 9,d,e). The maximum radius of the arc extending southward from the N501 grid line was 60 cm. The following materials composed Feature 8:

	N500 E996	N500 E997
Tuff Count	398	60
Tuff Weight (g)	3673	519
Sandstone Count	0	4
Sandstone Weight (g)	0	326
Mussel Shell Umbo Count	1	0
Mussel Shell Weight (g)	1	1
Rabdotus Count	65	6
Bone Count	2	3
Bone Weight (g)	1	1
Flake Count	6	0
Chip Count	5	0

Feature 8 is 10 cm below and 2 to 3 m north to northwest of Feature 7 and 4 m north of Feature 9. The lack of faunal remains (i.e., mussel shell, **Rabdotus**, and bone fragments) in appreciable quantities precludes speculation about a cooking facility.

The matrix was a gray brown silty clay with much mottling caused by decomposed tuff. No chipped stone artifacts were noted within or around the feature. Several mussel shells were located around the feature boundaries. The fill from the feature was nearly sterile except for a few snails. Carbon was scattered throughout the feature, some chunks measured 2 cm^2. A radiocarbon date of 840-820 B.C. (MASCA corrected) was obtained for Level 16 (97.85-97.75 m) of Units N500 E996 and N500 E997, and charcoal from Feature 8 of Unit N500 E996 yielded a radiocarbon date of 720-660 B.C. (MASCA corrected).

Feature 10

A small, compact deposit of **Rabdotus** snail shells, designated Feature 10, was located at Level 18 (97.65-97.55) in Units N497 E997 and N498 E997 (Figs. 13,b; 15). Constituents consisted of 12 g of tuff, 11 g of sandstone, 1 g of mussel shell, 260 **Rabdotus** snail shells, one bone fragment, and two chert chips.

Horizon 5

Levels 19-25 comprise Horizon 5. Only the northernmost units (N500 E996, N500 E997, and N500 E998) were excavated through Level 25. Beginning with Level 19, the amount of all debris types decreased significantly. Selected cultural remains are as follows:

	N500 E996	N500 E997	N500 E998	Total
Tuff Weight (g)	70	150	100	320
Sandstone Weight (g)	15	23	2	40
Fire-Fractured Rock Weight (g)	49	63	89	201
Mussel Shell Umbo Count	1	0	1	2
Mussel Shell Weight (g)	5	0	5	10
Rabdotus Count	84	113	229	426
Bone Count	1	1	18	20
Bone Weight (g)	1	0	4	5
Biface Count	1	1	0	2
Flake Count	27	38	35	100
Chip Count	42	45	29	116

In Level 19 of Unit N500 E996, one thin biface (Group 3, Form 1, Specimen 6) was recovered. The only identifiable animal bone was one freshwater drum otolith. Levels 19-25 were generally sterile compared to the previous levels. The soil became lighter in color, a yellowish tan, and somewhat harder to dig.

A soil auger was finally used to test 30 to 40 cm below the floor of Level 25 in Unit N500 E996. No cultural debris was encountered.

Stratigraphy

Area B was excavated through Level 18 (97.65-97.55 m) over most of the excavation block, while the three northernmost units (N500 E996-998) were excavated through Level 25 (96.95-96.85 m). Prior to beginning excavations in the northernmost units, the existing north wall of Area B was profiled (Figs. 13,c; 17). When excavations were completed for the entire block, the west wall was profiled (Figs. 13,d,e; 16). The stratigraphy revealed eight depositional zones (Fig. 13,f; 16-17) which are described below:

Zone 1: A horizon of modern soil; dark grayish brown (10 YR 3/1-2) friable, humus-rich, sandy, silty clay; browner, sandier, and more friable than other zones; moderately undulating, poorly defined lower contact. The unevenness

Figure 13. **Phase II Excavations: Area B.**

a, Area B, Feature 9;

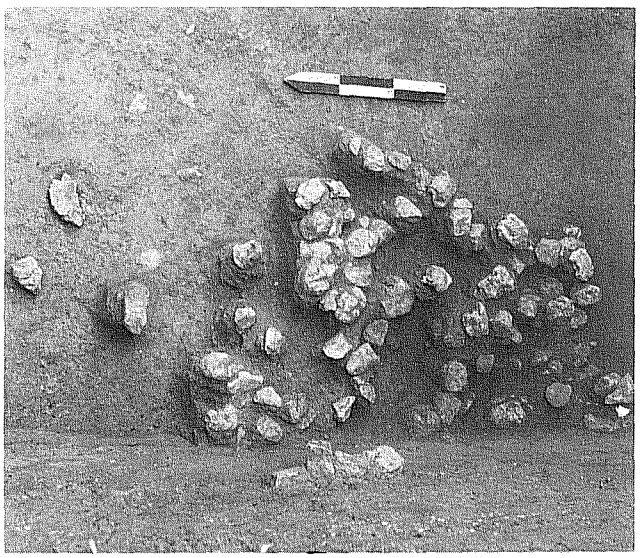
b, Area B, Feature 10, compact deposit of **Rabdotus** land snails at Level 18 (97.65-97.55 m);

c, view of north wall profile;

d, view of north end of west wall profile;

e, view of south end of west wall profile;

f, Area B, view northwest.



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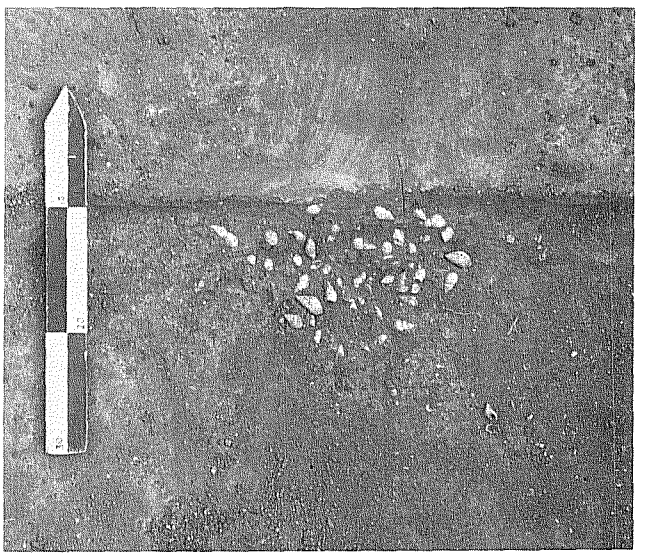

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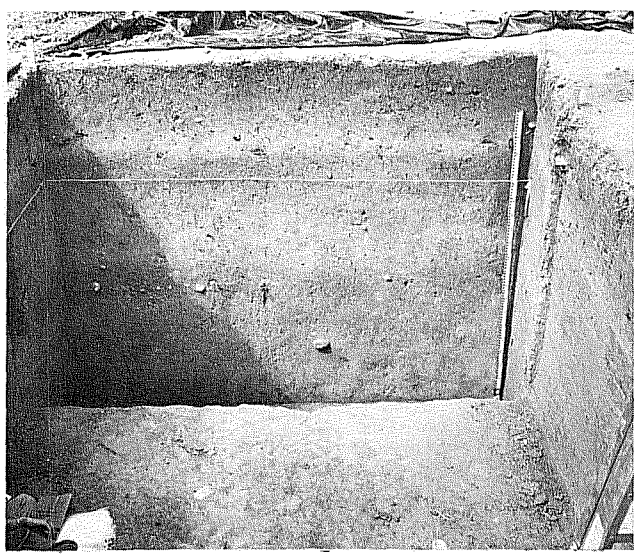

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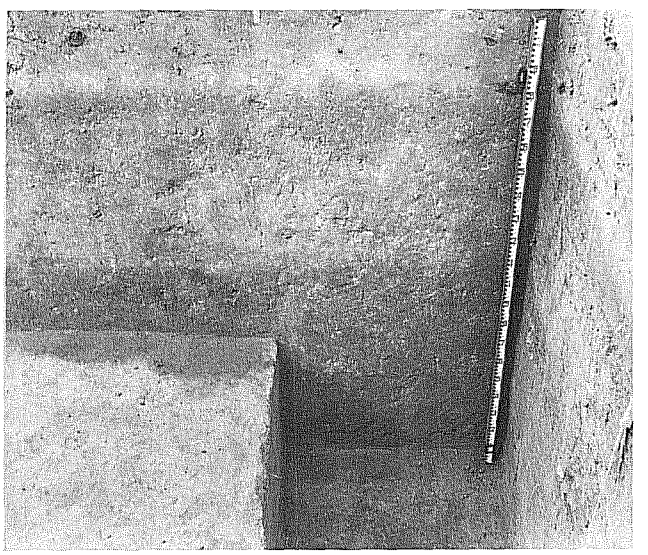

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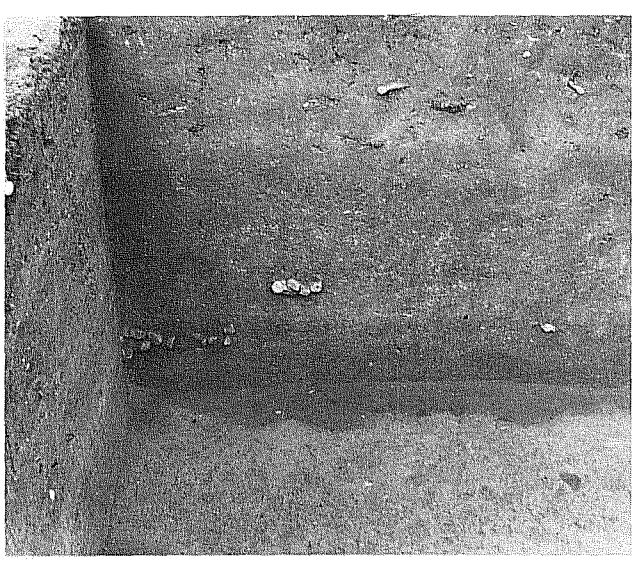

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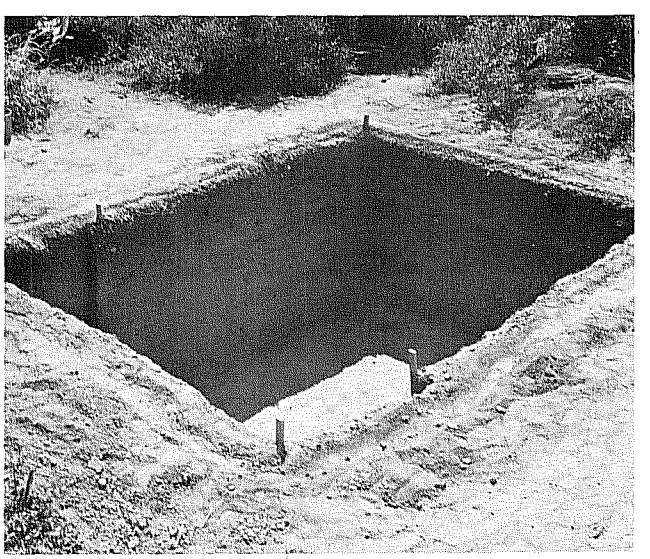

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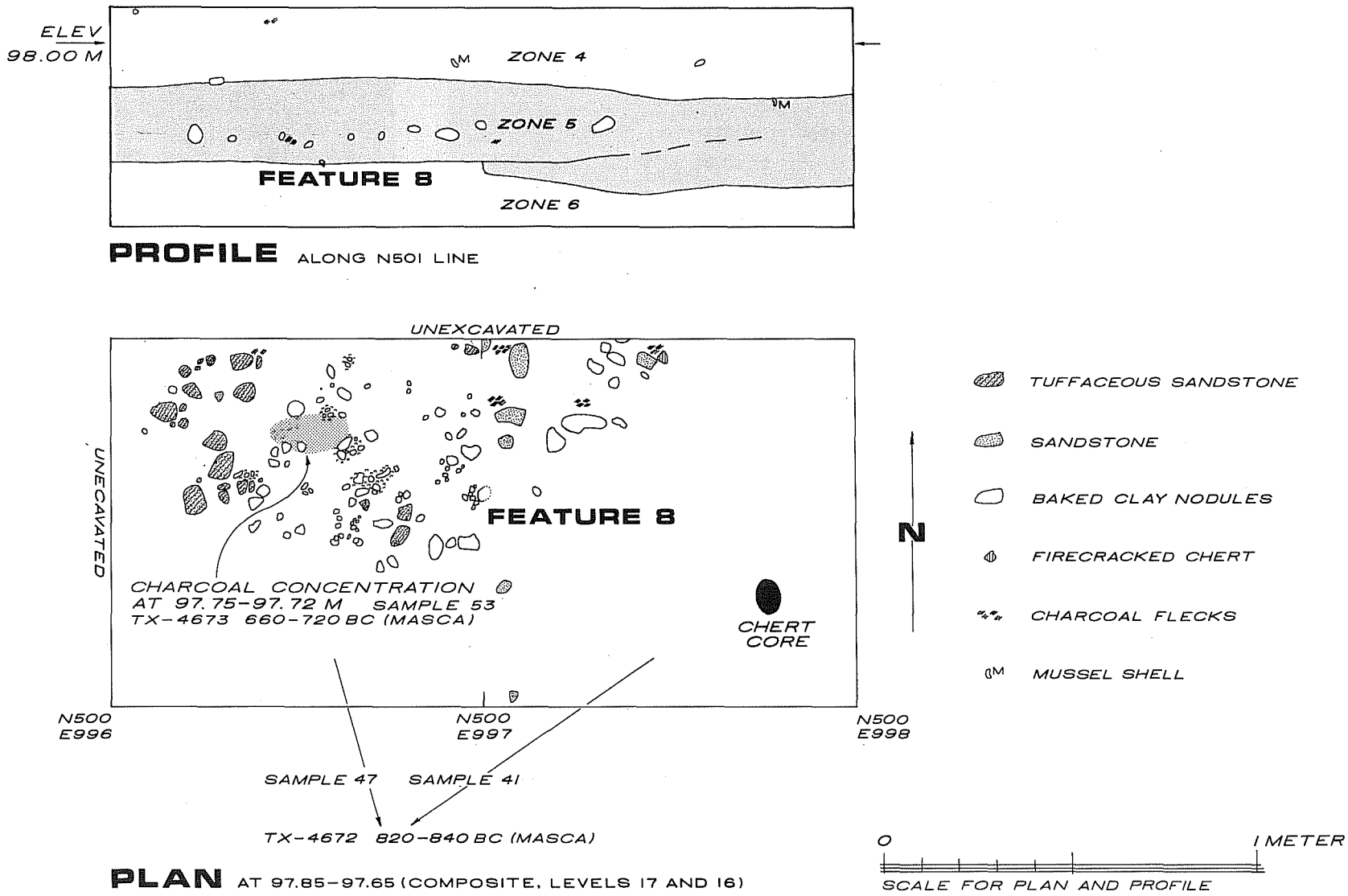


Figure 14. **Phase II Excavations: Feature 8, Profile and Plan.** Feature 8, a cluster of baked clay nodules, some partially crumbled, with some fire-cracked sandstone and tuffaceous sandstone. Most of the feature was uncovered in Level 16, but a few items in the western unit were found in Level 17.

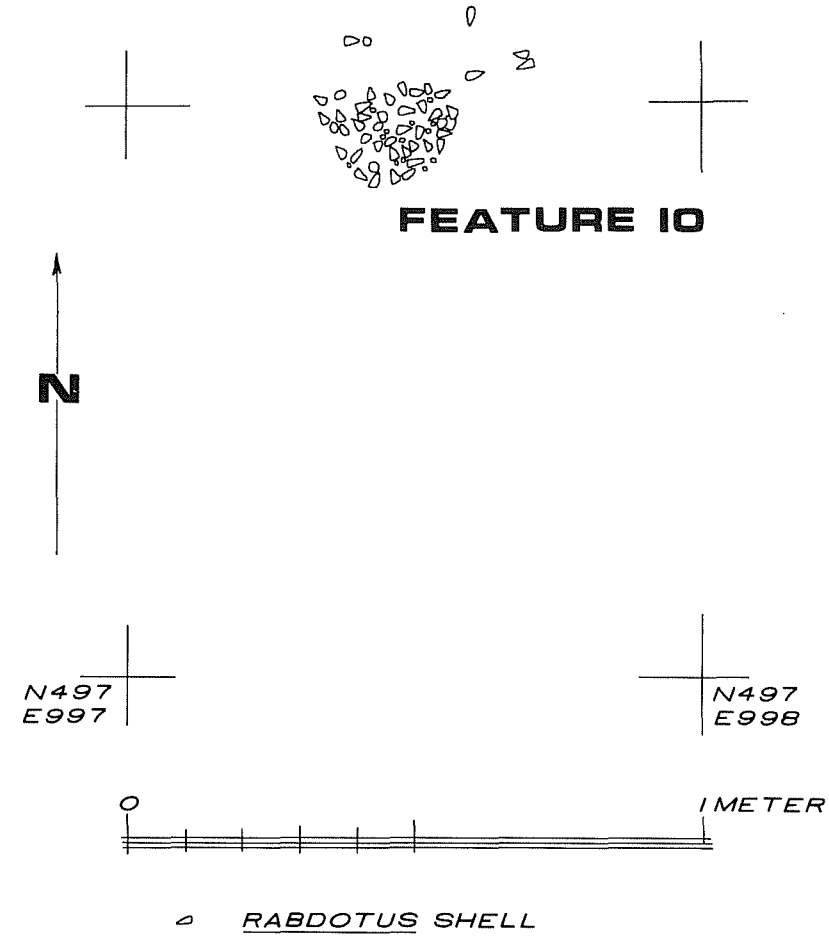
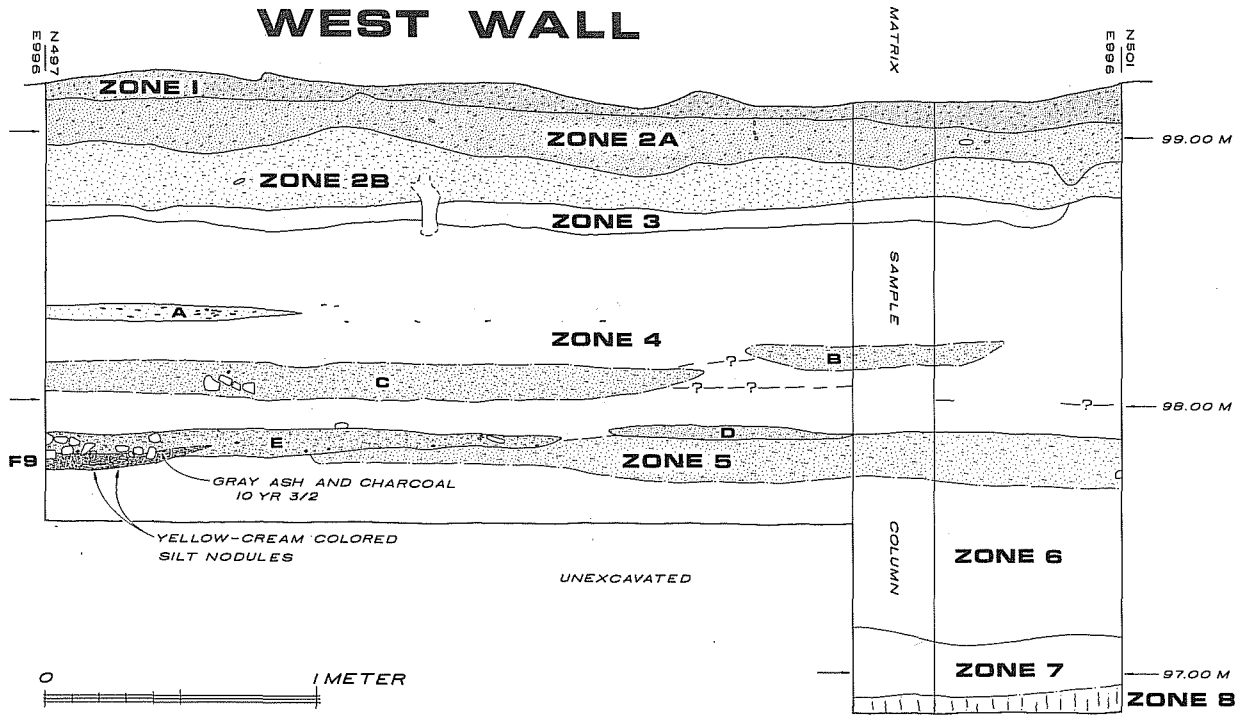


Figure 15. **Phase II Excavations: Feature 10, Rabdotus Concentration, Area B, Level 18 (97.65-97.55 m).**



LENSES:

A--Zone 4 matrix with mussel shell fragments and small orange fired clay nodules; 7.5 YR 3/2.

B--10 YR 3/1, similar to lens "C" but slightly higher in elevation.

C--Grayer (10 YR 3/1) than the enclosing sediment, with abundant caliche webbing, charcoal bits, orange fired clay nodules, mussel shell fragments and snail shell; possibly continuous with lens "B."

D--Slightly darker gray, with scattered charcoal bits and more caliche webbing than the zones above or below. Perhaps associated with lens "E" and Feature 9.

E--Similar to lens "C" but with more charcoal; 10 YR 3/1; a scatter of debris from Feature 9.

Figure 16. **Phase II Excavations: Profile of West Wall of Area B.** West wall of Area B excavation block, looking west. Numbered zones are major depositional or soil (Zones 1-7) units; lenses with letter designations are limited in extent and probably of cultural origin for the most part. Small black objects shown in and to the right of lens "A" are mussel shells. Minor discrepancies between the west wall profile and the north wall profile (Fig. 17) are due to the faintness of the stratigraphy and to different lighting conditions.

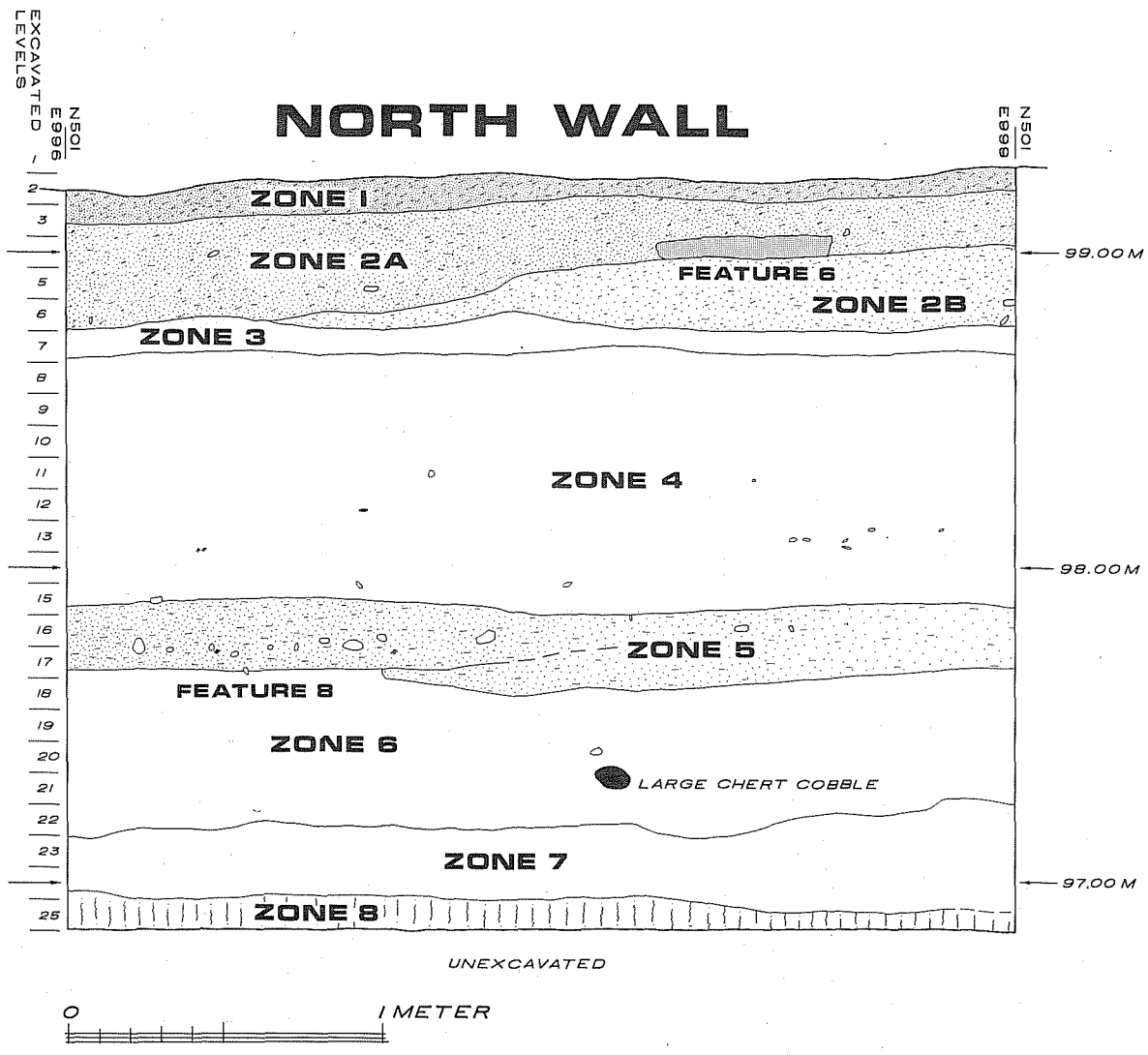


Figure 17. **Phase II Excavations: Profile of North Wall of Area B.** Refer to text (Stratigraphy section) for a discussion of each soil zone.

of the ground surface is mainly due to trenches dug to control runoff around the excavations before the profile was drawn.

Zone 2A: Transitional zone between Zones 1 and 2B. Brownish gray (10 YR 3/1-2) sandy, silty clay; lower contact is sharp in some places, elsewhere gradational.

Zone 2B: Light gray (10 YR 3/2) silty, sandy clay with faint caliche webbing, occasional charcoal flecks, and mussel shells. This zone seemed to be discontinuous in the north wall. Feature 6 is associated with this zone.

Zone 3: Distinctive mottled yellow tan (2.5 YR to 10 YR 4/2) silty, sandy clay, mottled with gray variegations, bright in color; lower contact slightly undulating; no cultural debris visible in profile.

Zone 4: A thick unit with several discrete lenses; brownish gray (10 YR 3-4/2) silty, sandy clay with substantially higher clay content with overlying zones, but less gray than Zone 2B; develops abundant desiccation cracks when dry, especially in the upper portion; caliche webbing is more abundant in the lower half. The base of this unit rests atop Zone 5 and lenses "D" and "E."

Zone 5: Gray (10 YR 3/4) sandy, silty clay, darker and grayer than the strata above and below; both contacts indistinct except where lenses of cultural debris are present. In the north wall this zone gradually becomes lighter and less gray eastward. Features 8 and 9 and associated occupations have contributed a great deal of cultural debris.

Zone 6: Homogeneous, brownish gray (10 YR 3/1) silty, sandy clay; less friable and with higher clay content than overlying zones, although no desiccation cracks developed; the clay content increases with depth. Has less caliche webbing than Zone 4. Occasional snail shell or fire-cracked rock is present. Base exposed only in deep units along north wall, where color is 10 YR 4/2 at the base.

Zone 7: Very compact, yellowish gray (10 YR 5/4) fine sandy clay, cohesive and plastic when wet; caliche webbing infrequent; no cultural debris visible. Both contacts somewhat arbitrary and gradational.

Zone 8: Similar to Zone 7 but more compact, with higher clay content and vertical gray root stains. The division between the two is essentially arbitrary. Color is 10 YR 5/3.

THE AREA C EXCAVATIONS

The discovery of an intact feature (Feature 6) with associated undisturbed artifacts and faunal remains in the northern part of Area B strongly suggested that the portion of the site near the slough had not been disturbed in the upper levels by recent bulldozing or chaining. To examine the possibility of stratification within the Late Prehistoric zone, a new excavation area was laid out northeast of Area B and designated Area C (see

Fig. 2). Three 1-m^2 units (N510 E1020, N510 E1021, and N510 E1022) were excavated in 5-cm levels.

Two units were excavated through Level 8, approximately 40 cm below the surface; the third unit was only taken down one level, or 5 cm. The amount of cultural debris from these units did not meet anticipated expectations as concentrated amounts of Late Prehistoric materials were not present in this area of the site. Diagnostic artifacts attributable to the Late Prehistoric period are two arrow point fragments and three ceramic sherds. Other items included three thin biface fragments, one core, two mano fragments, and one small unidentifiable ground stone fragment. Many small animal bones, mussel shells, and land snail shells were recovered. Identifiable animal bones represent gar, catfish, freshwater drum, unidentifiable snake, unidentifiable turtle, unidentifiable artiodactyl, jackrabbit, cottontail rabbit, and wood rat.

The following amounts of selected materials were recovered from Area C:

Tuff Weight (g)	139
Sandstone Weight (g)	336
Fire-Fractured Rock Weight (g)	261
Mussel Shell Umbo Count	157
Mussel Shell Weight (g)	690
Rabdotus Count	229
Bone Count	833
Bone Weight (g)	160
Ceramic Sherd Count	4
Biface Count	5
Core Count	1
Flake Count	145
Chip Count	204
Ground Stone Count	3

LITHIC ARTIFACTS

Lithic artifacts recovered during excavations at 41 LK 201 have been placed in nine descriptive categories: cores, thick bifaces, thin bifaces, distally beveled bifaces and unifaces, modified and trimmed flakes, debitage, ground stone, and miscellaneous materials. The first six categories are chipped stone items which are subdivided into several groups and forms as devised by Hall (Hall, Black, and Graves 1982:249-387). Specimens are made of chert unless stated otherwise. Ground stone items are predominantly sandstone implements and are also grouped into several categories.

In addition to a group number and a form number (where applicable), thin bifaces were assigned specimen numbers. The thin bifaces from 41 LK 201 were first grouped with all other Phase II thin bifaces as part of a reservoir-wide lithic study. Each specimen in each group was then assigned a sequential number. Therefore, the numbers assigned to the thin bifaces from 41 LK 201 do not correspond to the total number of items per group at this particular site, but do correspond to a sequential series of numbers per group for the total Phase II sample.

Each category is described and discussed. These groups are compatible with the reservoir-wide study of lithic artifacts for Phase II (Hall, Hester, and Black 1986:230-334). Appendix II provides provenience information, dimensions (centimeters), and weights (grams).

CHIPPED STONE ARTIFACTS

Cores (63 specimens)

Cores are stream-rolled cobbles or large, thick flakes from which two or more flakes have been removed to either produce flakes or to reduce the nodule or flake into a finished tool form (Hall, Black, and Graves 1982:250). During Phase I, nine core groups were recognized based on the following criteria established by Hall (**ibid.**:250-266): the direction(s) from which flakes were struck, striking platform preparation, striking platform morphology, size, shape, and degree of reduction.

During Phase I, Groups 1, 2, 3, 7, 8, and 9 were recognized at 41 LK 201. Groups 1, 2, 3, 5, 6, and 9 were identified from the Phase II excavations and are discussed below. Appendix II, Table 13 provides provenience information and metric data where applicable. All cores are chert unless stated otherwise.

Group 1. Natural Platform (10 specimens)

Group 1 cores are cortex-covered cobbles from which flakes have been removed using natural platforms. The irregularly shaped cobbles exhibit both unidirectional and multidirectional flaking. Flake scars are usually restricted to one end or edge, with most specimens retaining at least 50% cortex. Five specimens have one or two flake scars; the other five have five or more scars. An example of Group 1 cores is shown in Figure 18,a.

Group 2. Bidirectional, Natural and Prepared Platforms (10 specimens)

Group 2 cores have been struck bidirectionally at one end or along one side. Flakes were first removed using natural cortex platforms. The resulting flake scars were then used as platforms to remove additional flakes in the opposite direction. Specimens retain 60-90% cortex. An example of Group 2 cores is shown in Figure 18,b.

Group 3. Multidirectional, Natural and Prepared Platforms, Single and Multiple Facets (six specimens)

Group 3 cores have both natural and prepared platforms with single and multiple facets from which flakes have been removed multidirectionally. All specimens from 41 LK 201 are fashioned from cobbles. Five cores have cortex on one end; one specimen has no cortex. An example of Group 3 cores is shown in Figure 18,c.

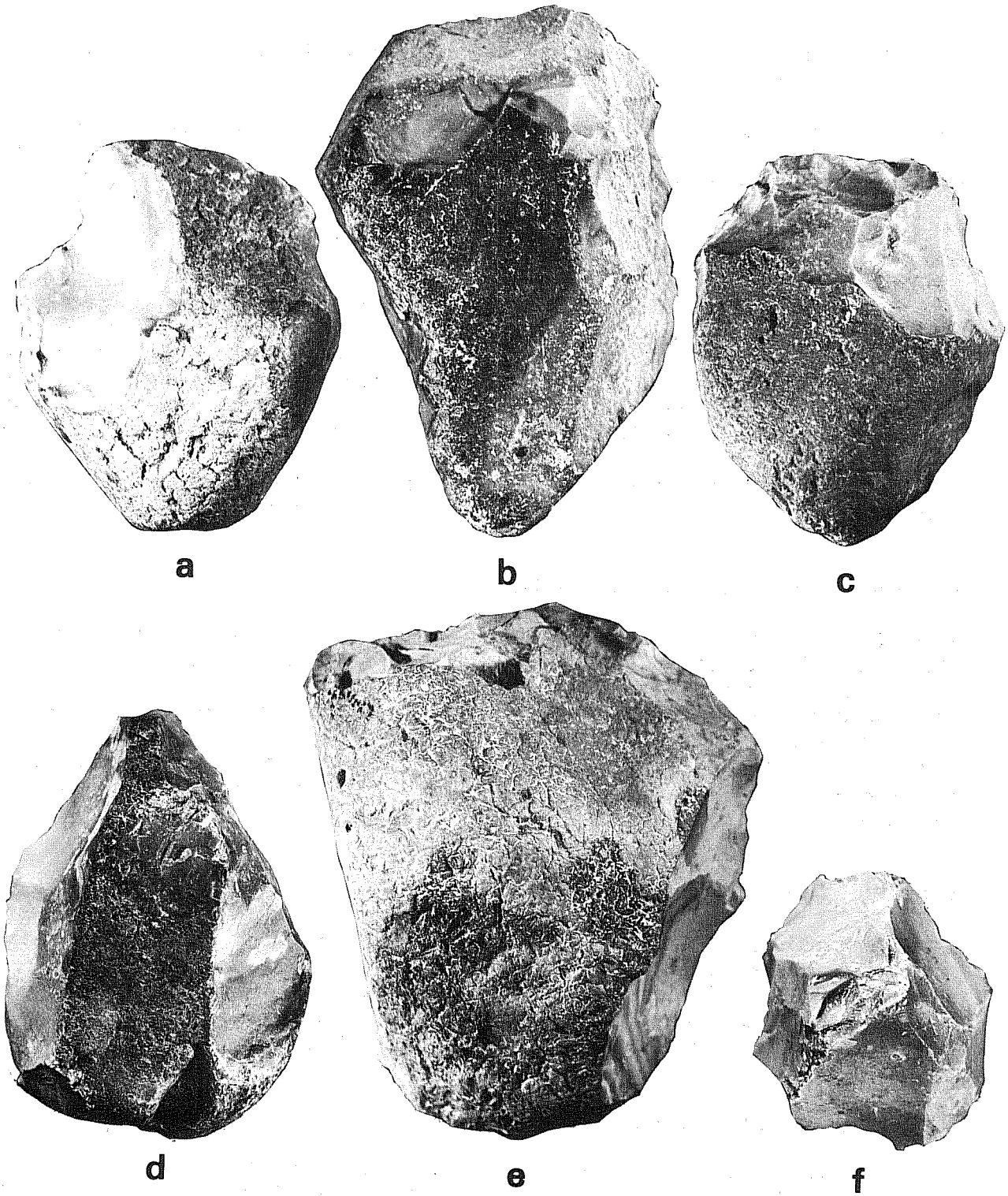


Figure 18. **Phase II Excavations: Cores.** a, Group 1; b, Group 2; c, Group 3; d, Group 5; e, Group 5, modified; f, Group 6.

Group 5. Multidirectional, Natural and Prepared Platforms, Single Facet (12 specimens)

Group 5 cores show flakes were struck multidirectionally from single facet prepared platforms and natural platforms. Most specimens retain at least 25-50% cortex. An example of Group 5 cores is shown in Figure 18,d.

Group 5. Tool

One specimen (Lot No. 262) in Group 5 has evidence of heavy use-wear; the edges are extremely worn and rounded, suggesting use as a chopping or scraping tool (Fig. 18,e). This plano-convex specimen was formed by splitting a large cobble. The convex side, which retains 80% cortex, has had only a few large flakes removed from this face. A little more than half of the periphery of the cobble, exhibiting a steep edge, was heavily utilized. Step-fractures occur along both ventral and dorsal surfaces. The edges are extremely smoothed and rounded as are some of the ridges of the step-fractures which occur 6 to 8 mm away from the edge of the tool.

Group 6. Core Nuclei (eight specimens)

Group 6 consists of exhausted cobbles and flakes that have been reduced to the point where additional flake removal would be impossible or impractical. These small specimens vary from subcircular to irregular in shape. Cortex and prepared platforms with single and multiple facets were used to remove flakes multidirectionally. Platforms were commonly crushed or battered. The majority of the specimens have little or no cortex; however, several specimens retain 50% cortex. An example of core nuclei is shown in Figure 18,f.

Group 9. Core Fragments (17 specimens)

Group 9 consists of unclassifiable core fragments which probably represent remnants of shattered cores or trimmings from platform preparation and general shaping. Two chalcedony core fragments and one petrified wood core fragment were recovered. Due to the fragmentary nature of the specimens, metric attributes and illustrations are not provided.

Thick Bifaces (13 specimens)

Thick bifaces, as defined by Hall (Hall, Black, and Graves 1982:266), are percussion-flaked chipped stone specimens which are 1.3 cm or more in thickness. Ten or more flake scars are present, each being in excess of 1 cm^2. Neither the shape of the specimens nor wear patterns suggest function. All presumably represent manufacturing failures or rejects. Additional descriptive information is provided below for each group.

Nine morphological groupings were defined for the reservoir-wide study conducted for Phase I; examples from Groups 2, 3, 7, 8, and 9 were recovered

during Phase II excavations at 41 LK 201. Appendix II, Table 14 provides provenience information and metric data. All specimens are made of chert.

Group 2. Elliptical (one specimen; Fig. 19,a)

The Group 2 elliptical specimen is plano-convex in cross section and has moderately undulating lateral edges. The convex side has the characteristic central ridge down the length of the specimen. The length is twice the width. All cortex has been removed.

Group 3. Oval to Subcircular (two specimens; Fig. 19,b-c)

Group 3 represents oval bifaces with moderately undulating lateral edges. Both specimens are biconvex in cross section. One specimen has cortex on one side; the other specimen has no cortex.

Group 7. Fragments with Rounded Ends (three specimens)

Group 7 represents fragmentary thick bifaces with rounded ends. This category is divided into four subgroups or forms, only two of which were present in the Phase II excavations at 41 LK 201.

Form 1. Fragments of Subcircular and Oval Bifaces (one specimen)

Group 7, Form 1 specimen is probably a broken example of Group 2 (Elliptical) or Group 3 (Oval to Subcircular) thick bifaces. One face is 90% cortex, very large flake scars are present on the opposite face.

Form 3. Elliptical (two specimens)

Group 7, Form 3 specimens may represent fragments of Group 2 (Elliptical) since the broken lengths usually exceed the widths. Both specimens have some cortex remaining on both faces.

Group 8. Odd and Miscellaneous Forms--Whole and Fragmentary (three specimens)

Group 8 specimens represent unusual artifacts that do not conform to previously described categories. One specimen (Lot No. 246) has been retouched or trimmed along the wider edge.

Group 9. Lateral and Medial Fragments (four specimens)

The four specimens from Group 9 are fragmentary and cannot be classified or placed into previously described groupings.

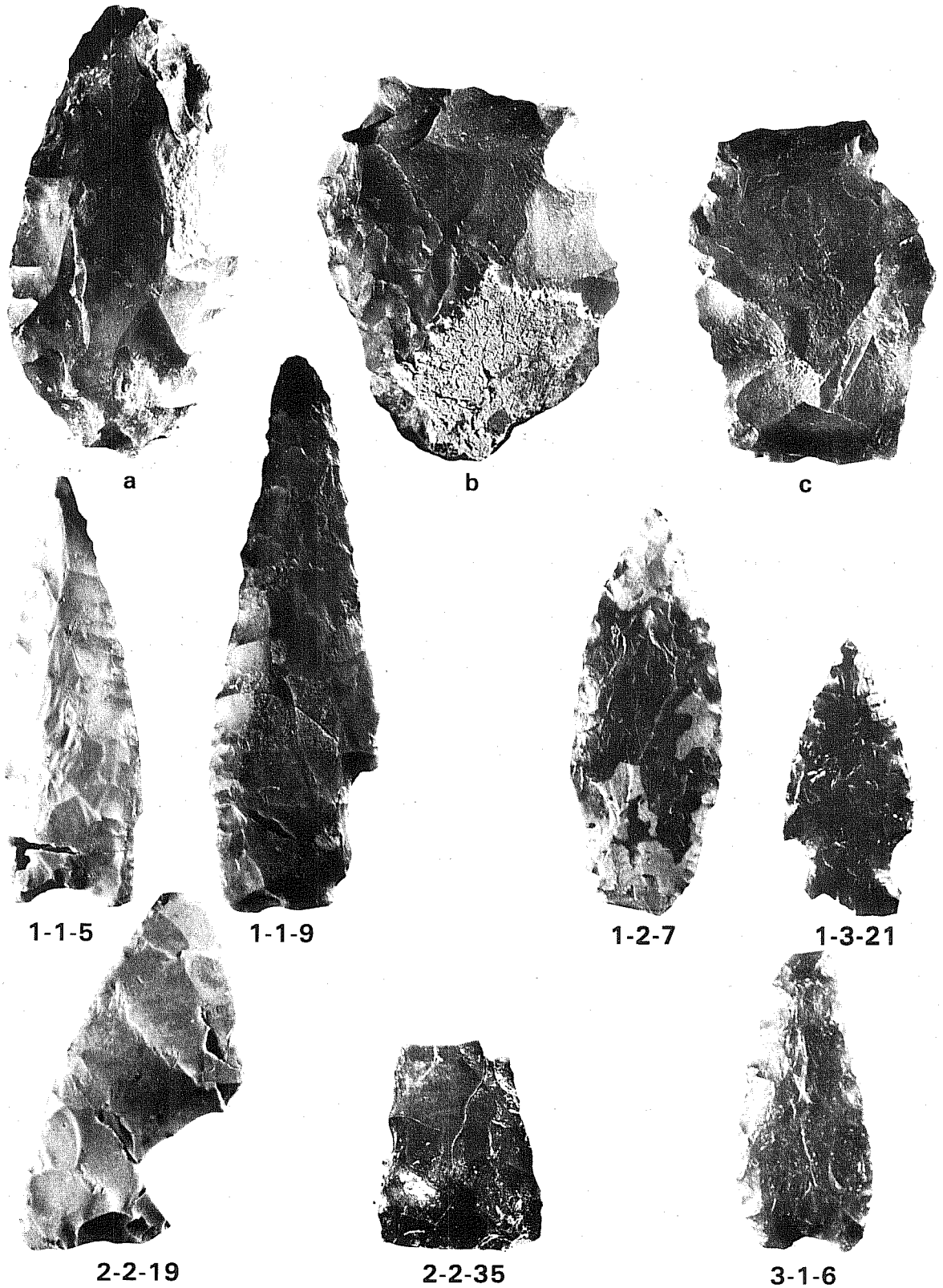


Figure 19. **Phase II Excavations: Thick Bifaces, Groups 2 and 3 and Thin Bifaces, Groups 1, 2, and 3.** a, thick biface, Group 2; b,c, thick bifaces, Group 3. Numbers beneath artifact indicate group, form, and specimen number, respectively.

Thin Bifaces (100 specimens)

Thin bifaces have been classified according to the following criteria established by Hall (Hall, Black, and Graves 1982:278): measure less than 1.3 cm thick; appear to have been shaped by pressure flaking; generally have straight, smooth edges; and retain no cortex. The specimens have been grouped according to general morphological characteristics (**ibid.**). Provenience and metric data are provided in Appendix II, Tables 15 and 16.

Group 1. Stemmed (41 specimens)

Form 1. Large with Straight Stems (two specimens)

The description for Group 1, Form 1 is that of large bifaces that have more or less parallel-edged stems.

Specimen 5: Group 1, Form 1, Specimen 5 has a long, slender blade with straight edges and slight shoulders (Fig. 19). The parallel-edged stem has a concave, broadly U-shaped basal edge and is somewhat similar to the **Pedernales** type. One face of the stem was thinned by the removal of one large flake. This specimen was recovered from Level 18 (97.65-97.55 m) of Unit N498 E996 in Area B.

Specimen 9: Group 1, Form 1, Specimen 9 is a long, slender biface and is somewhat asymmetrical due to alternate beveling along the left lateral edge of the blade (Fig. 19). This resulted in the removal of the left shoulder. The beveling extends the length of the blade and gives a twisted look to the specimen. The specimen has a parallel-edged stem with a base that is fairly straight. It has been burned and is badly potlidded on one face. This specimen was recovered from Level 10 (98.85-98.75 m) of Unit N490 E1044 in Area A.

Form 2. Large with Contracting Stems (one specimen)

Group 1, Form 2 thin bifaces have stem edges that contract or taper inward at the base.

Specimen 7: Group 1, Form 2, Specimen 7, fashioned from a distinctive yellow and brown mottled chert, has a triangular blade with convex lateral edges (Fig. 19). It is classified as a **Morhiss** point. Very slight shoulders give way to a stem with contracting edges that taper to an irregular convex basal edge. The lower half of the specimen is much thinner than the thicker distal tip. This biface came from Level 6 (98.85-98.75 m) of Unit N500 E998 in Area B.

Form 3. Large with Expanding Stems (one specimen)

Group 1, Form 3 thin bifaces have expanding stems which result from deep side or corner notching.

Specimen 21: Group 1, Form 3, Specimen 21 is side notched and is a small dart point variety (Fig. 19). The triangular blade has convex lateral edges. The lower portion has been heat fractured, thus, making a positive identification difficult. However, it appears to be of the **Ensor** variety. It was found in Level 11 (98.75-98.65 m) of Unit N491 E1043 in Area A.

Form 4. Small with Contracting Stems (17 specimens; Fig. 20)

Perdiz points are predominant in the Late Prehistoric projectile point assemblage from 41 LK 201. During Phases I and II, **Perdiz** arrow points represented the only arrow point form recovered from the upper levels, and it appeared that no other arrow point styles were present. However, during the third season of field work at the site, three expanding stem arrow points were found in association with **Perdiz** points.

Perdiz points have triangular blades with concave, convex, or straight lateral edges; Specimen 6 has serrated lateral edges. The majority of the specimens have strongly barbed shoulders. The characteristic contracting stems are usually pointed, although two specimens have slightly rounded ends. Three specimens are bifacially thinned and shaped. The majority, however, have bifacially shaped contracting stems, while the blades are basically unifacial.

These specimens have been made on chert flakes or blades. A few are quite crude, and several have been made on extremely curved flakes or blades. Specimen 84 has a well-defined stem, but the distal portion has been shaped, and the tip still retains a wide, lipped platform. Three arrow points in Level 3 of Unit N498 E997 exhibit a wide range of workmanship. Specimen 8 is much larger than typical **Perdiz** points and appears unfinished. Specimen 6 has a thicker blade than most **Perdiz** points but is of average length, while Specimen 7 is well made and the most delicate of the arrow points recovered during Phase II.

Form 7. Unclassifiable Fragments of Small Stemmed Bifaces (20 specimens; Fig. 20)

Group 1, Form 7 consists of distal, medial, and proximal fragments of arrow points. Specimens 11, 12, and 13 are barbed medial fragments which have snapped distal tips. All three specimens have been bifacially shaped. A fourth specimen is the complete distal portion of an arrow point whose stem was snapped off transversely. The curved flake has been minimally shaped and still retains a small lipped platform at the distal tip.

In addition to these four larger fragments, 19 small fragments were also recovered. Of these, nine are from Level 3 (99.15-99.05 m) of Unit N500 E998, a fine screen unit. These nine fragments consist of two lateral fragments and seven pointed fragments which appear to be distal tips, although one or two might be stem or barb fragments. From other excavated units, the remaining specimens are either distal fragments, barbs, or lateral edges. The majority of the fragments exhibit bifacial flaking, while others have minimal unifacial trimming or shaping and appear to represent

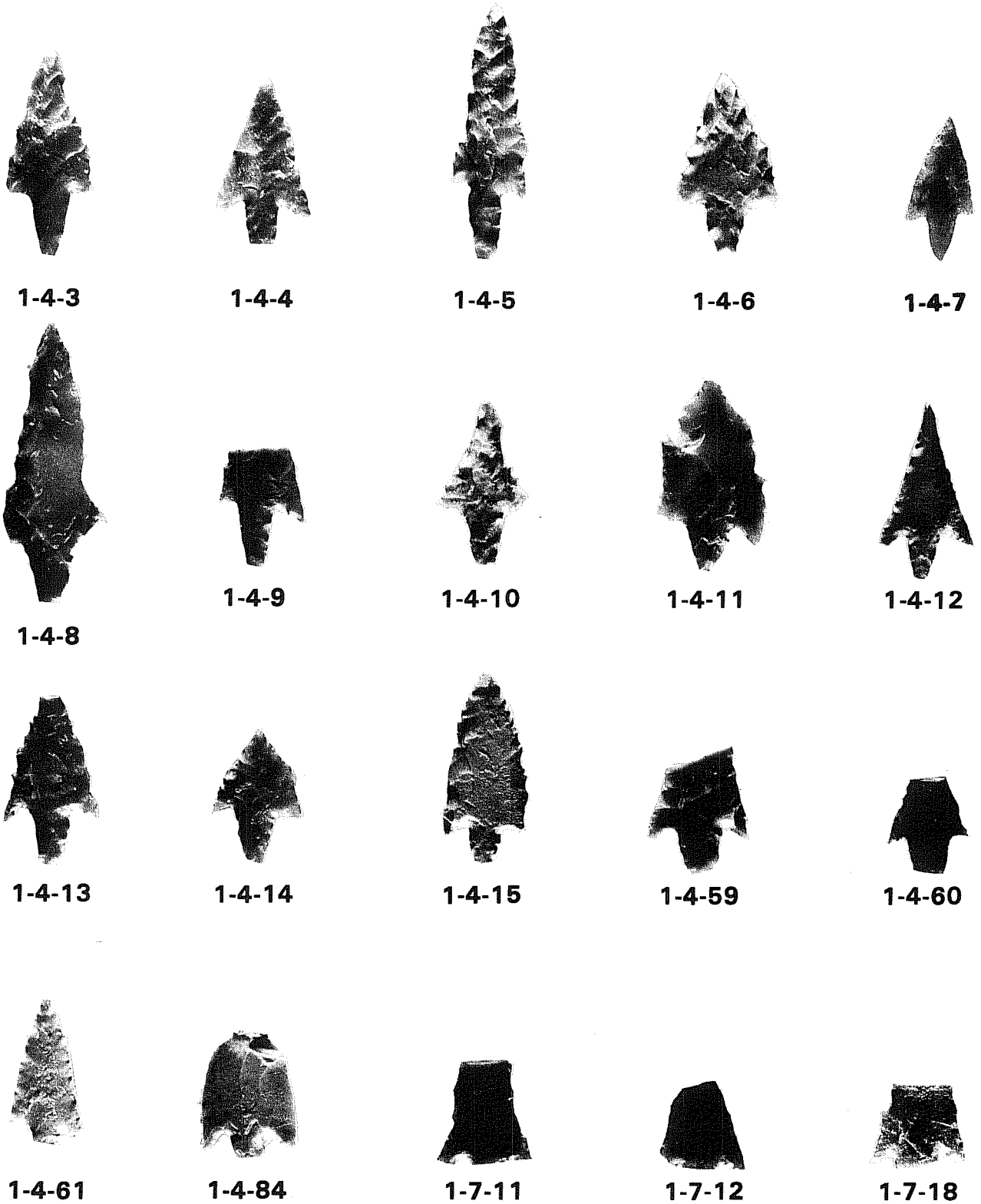


Figure 20. **Phase II Excavations: Thin Bifaces, Group 1, Forms 4 (Perdiz Points) and 7 (Unclassified Fragments).** Numbers beneath each specimen indicate group, form, and specimen number, respectively.

manufacturing failures. Attempts to fit these assorted fragments onto other larger portions of arrow points were unsuccessful. These artifacts were not assigned specimen numbers.

Group 2. Unstemmed with Straight Bases (two specimens)

Form 2. Proximal Fragments (two specimens)

Specimen 19: Group 2, Form 2, Specimen 19, apparently broken during manufacture, has been partially reconstructed (Fig. 19). The distal portion and one corner of the proximal end fit together. Both were found in Unit N499 E997 at Level 3 (99.15-99.05 m). The lateral edges are slightly convex, and the distal tip has had very little shaping.

Specimen 35: Group 2, Form 2, Specimen 35 is a badly burned basal fragment which has alternately beveled lateral edges (Fig. 19). The bevel, occurring on the left edge, extends upward from the basal edge. A burned bifacial fragment from the same unit and level (N490 E1043, Level 10) appears to be the extreme distal portion of the beveled biface. The proximal portion has been thinned by the removal of a longitudinal flake struck from the basal edge.

Group 3. Unstemmed with Concave Bases (one specimen)

Form 1. Complete Triangular (one specimen)

Specimen 6: Group 3, Form 1, Specimen 6 has convex lateral edges. The distal tip has been removed by an impact fracture. The basal corners have been rounded, and a U-shaped basal notch is present (Fig. 19). The specimen is similar to **Kinney** points.

Group 4. Unstemmed with Convex to Semicircular Bases (23 specimens)

Form 1. Complete Triangular (one specimen)

Specimen 14: Group 4, Form 1, Specimen 14 has one straight lateral edge and one slightly irregular lateral edge (Fig. 21). The basal edge is convex.

Form 2. Steeply Beveled Blades (two specimens)

Specimens in this category are often referred to as beveled knives. This form typically has convex or rounded basal edges, although other specimens may have basal edges that contract. The long blades are alternately beveled, usually on the left edge. Brown's (Brown **et al.** 1982:55-63) recent synthesis on beveled knives will be discussed in Part II of this report which deals with the UTSA Field School excavations. During those investigations, 12 beveled knives were recovered.

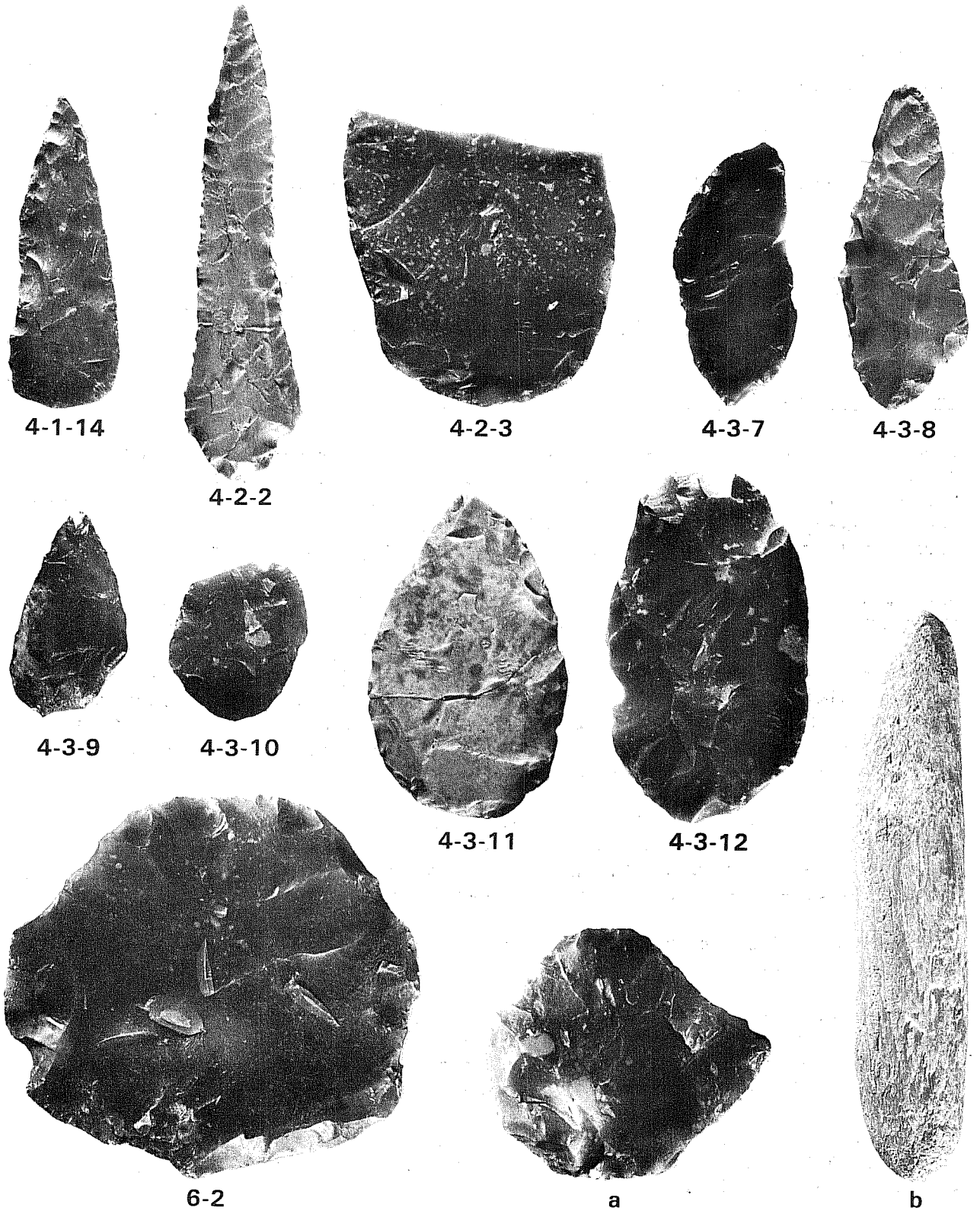


Figure 21. **Phase II Excavations: Thin Bifaces, Groups 4 and 6, Uniface, and Satin Spar Gypsum.** Numbers beneath each specimen indicate group, form, and specimen number, respectively. a, uniface; b, satin spar gypsum.

Specimen 2: Although the overall shape of Group 4, Form 2, Specimen 2 is similar to beveled knives, it is considerably thinner and narrower, and the beveling effect is not as pronounced as is typical for this artifact form (Fig. 21). The blade appears to have been resharpened as it constricts from the semicircular proximal portion. The specimen was broken, possibly through use. The two fragments were found in two units in Area A. The proximal fragment was found in Level 1 of Unit N499 E998, and the distal portion was recovered from Level 3 of Unit N498 E997.

Specimen 3: Group 4, Form 2, Specimen 3, a basal fragment, has a convex, semicircular basal edge (Fig. 21). Beveling is not evident along the remaining lateral edge. The broken specimen exhibits a transverse break.

Form 3. Oval to Elliptical (six specimens)

Specimen 7: Group 4, Form 3, Specimen 7, a slightly bipointed reconstructed specimen, appears to have been broken during the thinning or resharpening process (Fig. 21). A transverse break resulted. Portions of the periphery are extremely dulled. One portion was recovered from Level 2 of Unit N498 E996, while the other was located in Level 3 of Unit N500 E996.

Specimen 8: Group 4, Form 3, Specimen 8 was also reconstructed from two fragments found in Level 3 of Unit N498 E996 (Fig. 21). Two large knots are visible on one face, and attempts to remove them may have resulted in breakage of the biface. This specimen may represent a **Perdiz** preform. Two large, rather crudely made **Perdiz** points were found near this specimen, one in Level 3 and one in Level 4 of Unit N498 E996. The preformlike biface has been flaked primarily on one face with minimal shaping on the opposite face--a common characteristic of **Perdiz** points.

Specimen 9: Group 4, Form 3, Specimen 9 is a small ovate specimen, made of petrified wood; it is missing a portion of the proximal end (Fig. 21). The specimen is similar to the **Catán** form, an unstemmed point type occurring from Archaic to Late Prehistoric times (Hester 1980:98).

Specimen 10: Group 4, Form 3, Specimen 10 is fragmentary and well-thinned and oval to circular in shape (Fig. 21).

Specimen 11: Group 4, Form 3, Specimen 11 is an ovate specimen and was apparently broken during the manufacturing process (Fig. 21). The pointed distal portion was found in Level 3 of Unit N499 E997, while the convex-edged proximal portion was recovered from Level 4 of the same unit.

Specimen 12: Group 4, Form 3, Specimen 12 is an elliptical specimen with straight lateral edges that curve inward to form convex edges on both ends of the specimen (Fig. 21).

Form 4. Fragments with Convex to Semicircular Ends (14 specimens)

Group 4, Form 4 specimens are fragments that primarily represent specimens broken either during the manufacturing process or during use, although some

specimens may have been broken postdepositionally. Only a few appear to be finished or nearly finished; others appear to be in the preform stage. One specimen has been badly burned. Only two specimens retain cortex. The specimens range in width from 1.7 to 60.0 cm, and thicknesses range from 0.4 to 1.1 cm. Because of the fragmentary nature of these bifaces, only provenience information is provided in Appendix II, Table 16.

Group 6. Circular to Subcircular (one specimen)

Group 6, Specimen 2 is circular in outline with slightly irregular edges (Fig. 21).

Group 9. Fragments with Pointed Ends (15 specimens)

Group 9 specimens are fragments that primarily represent distal portions of bifaces. The majority appear unfinished, however, several specimens show excellent workmanship and appear finished. One specimen was reconstructed from a distal tip and a medial fragment from separate units. Group 9 specimens range in width from 0.9 to 2.9 cm and in thickness from 0.2 to 1.1 cm. Only provenience information is provided in Appendix II, Table 16.

Group 10. Lateral and Medial Fragments (19 specimens)

Group 10 specimens are lateral and medial fragments of thin bifaces. Most of these specimens are portions of crudely or minimally flaked bifaces. Provenience information is provided in Appendix II, Table 16.

Distally Beveled Bifaces and Unifaces (seven specimens)

Distally beveled bifaces and unifaces, often referred to as "gouges," have a distinctive beveled end which typically occurs along the wider portion of the tool. The beveled end or bit is the most distinguishing characteristic for this category. These specimens have been grouped according to the criteria established by Hall (Hall, Black, and Graves 1982:319-320). The tools, consisting of one uniface and six bifaces, will be described in detail below. Provenience and metric data are provided in Appendix II, Table 17.

Group 3. Short, Broad, Triangular to Subtriangular (two specimens)

Form 2. Triangular, Proximal End Rounded (one specimen)

Specimen 3: The width of the distal portion of this triangular biface exceeds the length of the specimen (see Appendix II, Table 17). The bit edge is relatively straight and the bevel rather steep (Fig. 22; Group 3, Form 2, Specimen 3). One corner of the bit has been broken off, and the resulting edge is rounded and smooth. The central portion of the working edge is similarly worn. Microscopic viewing of these two portions of the edge revealed rounded edges with polish occurring along these edges. The other

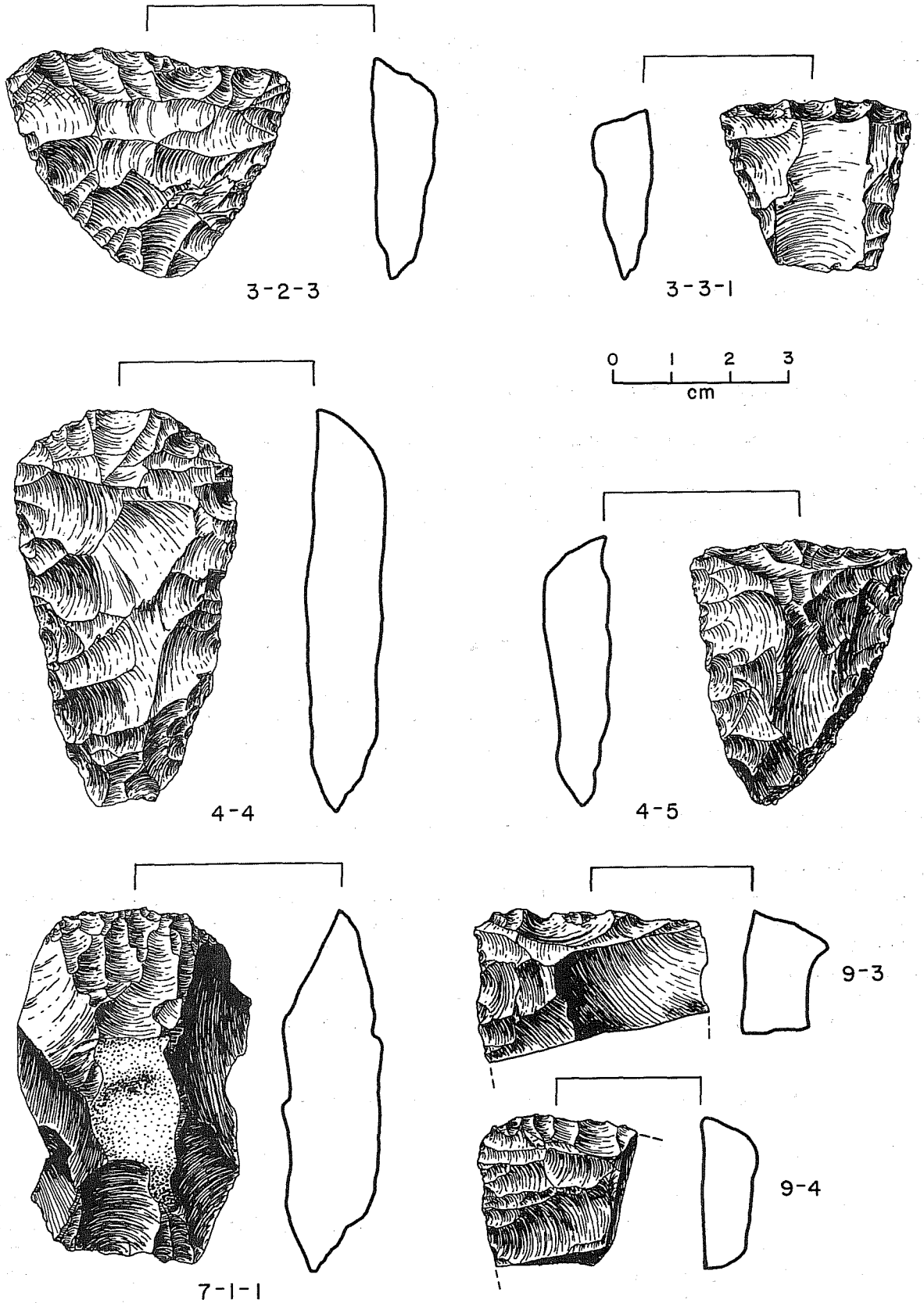


Figure 22. **Phase II Excavations: Distally Beveled Bifaces, Groups 3, 4, 7, and 9.** Two numbers beneath specimen indicate group and specimen number, three numbers indicate group, form, and specimen number, respectively.

portion of the bit retains a sharp edge. It appears that the tool was held at an angle, and only one corner and the central portion of the tool came in contact with whatever was being processed. The cross section is slightly convex with the dorsal (beveled) face more convex than the ventral face.

Radiocarbon dates for similar specimens from Phase II suggest a Middle to Late Archaic range for this tool form (Hall, Hester, and Black 1986:400). The 41 LK 201 specimen occurs with Late Archaic materials.

Form 3. Rectangular to Subrectangular (**Nueces** scraper after Hester, White, and White 1969) (one specimen)

Specimen 1: Group 3, Form 3, Specimen 1, subrectangular or trapezoidal, is bifacial with a biconvex cross section (Fig. 22). Similar specimens, termed **Nueces** scrapers, were initially documented by Hester, White, and White (1969). This small specimen has a slightly convex distal edge with a steep bevel. The bit end is much thicker than the proximal end. One long, wide thinning flake was struck from the proximal edge and extends the length of the tool to the bit on the dorsal face. This specimen was found in Level 11 of Unit N491 E1043 of Area A; Level 12 of the same unit was radiocarbon dated to 480 B.C. (MASCA corrected).

Group 4. Small Triangular to Subtriangular (two specimens)

Specimen 4: Group 4, Specimen 4, bifacial and triangular, has a convex, almost semicircular, bit edge (Fig. 22). The bevel is steep, but it recedes back to the thicker part of the distal end. The tool is biconvex in cross section with the dorsal (beveled) face more convex than the ventral face. The distal edge remains sharp, while the lateral and proximal edges are dulled. The dulling of the lateral edges stops just short of the bit. This specimen co-occurs with another distally beveled biface (Group 3, Form 2, Specimen 3).

Specimen 5: Group 4, Specimen 5, a triangular biface, has a straight distal edge with a steep bevel and is biconvex in cross section (Fig. 22). Dulling is present along one lateral edge only. This specimen is not as finely flaked as the three previously described specimens.

Group 7. Various Forms with Broad Rounded, Low-Angle Bevels (one specimen)

Form 1. Elongate, Elliptical to Subrectangular (one specimen)

Specimen 1: Group 7, Form 1, Specimen 1, a subrectangular biface, has a "shovel-shaped" distal end which is convex edged (Fig. 22). The angle of beveling is so low that there is not a distinct face on the specimen. A series of long, thin flakes have been struck from the bit edge and extend back along the dorsal face of the tool. Battering, as evidenced by tiny flake scars extending across the width of the working edge, is present. The battered edge is rounded and smoothed. A portion of one lateral edge is also dulled. The specimen is badly burned and potlidded. A patch of cortex is

centrally located on the dorsal face of the specimen. This specimen was found in Level 3 of Area B which yielded a radiocarbon date of A.D. 1470-1500 (MASCA corrected).

Group 9. Distal Fragments (two specimens)

Specimen 3: Group 9, Specimen 3, made of quartzite, has a slightly convex distal edge (Fig. 22). The bevel is both wide and steep.

Specimen 4: Group 9, Specimen 4 is the only unifacial specimen in this group of unique tools (Fig. 22). It is finely chipped and appears to have been heat treated. Only a portion of the lateral edge and the distal edge were recovered.

Discussion

Distally beveled bifaces or "gouges" are found all over south Texas, and numerous specimens were collected during both phases of work at Choke Canyon. Hall (Hall, Black, and Graves 1982:338-348) has provided an extensive discussion of this unique tool form including a review of geographical distributions, chronological data, and functional studies. A revision of the chronological placement of these tool forms is provided in Hall, Hester, and Black (1986).

Six of the seven distally beveled bifaces were recovered from Middle and Late Archaic contexts. One gouge (Group 9, Specimen 4) was recovered from the Middle Archaic occupational zone, while the others appear to be Late Archaic tool forms.

Uniface (one specimen)

A uniface is a flake or flake fragment that exhibits flake scars over most of one face with the opposite face unmodified.

Group 2. Subcircular to Oval (one specimen; Fig. 21,a)

One uniface Group 2 fragment appears to have been oval in shape and has a plano-convex cross section. It was recovered from the water screening area.

Modified and Trimmed Flakes

A total of 72 flakes and flake fragments exhibit flake scars along one or more edges. These specimens have been grouped into two categories: modified flakes and trimmed flakes. Modified flakes show edge damage in the form of small, irregular flake scars which apparently resulted from use. Trimmed flakes exhibit small, uniform flake scars which are the result of intentional shaping or trimming. It is assumed that the majority of flakes were utilized for short-term or minor tasks that required expedient cutting, or perhaps

scraping, capacities. Some of the flakes, however, may have sustained damage postdepositionally or during the excavation process, while others may represent early stages of the biface reduction process.

Provenience data and a brief description of each flake are provided in Appendix II, Table 18. Modified and trimmed flakes were found in Middle Archaic, Late Archaic, and Late Prehistoric contexts. The edge-altered specimens have been designated modified or trimmed through macroscopic examination only and, therefore, additional edge-altered specimens may have been overlooked during the sorting process.

Several of the trimmed flakes in this collection are referred to as end scrapers. Morphologically, these specimens are small, almost delicate, unifacial tools generally made on curved flakes that have been intentionally trimmed and shaped along the edge opposite the platform (Fig. 23,a-c). This tool form is typically present in south Texas Late Prehistoric assemblages that include **Perdiz** points, ceramics, and bison bone. They apparently functioned as scraping tools, and Hester (1977:20) has suggested that, due to their small size, they may have been hafted for use.

Debitage

Debitage totals by unit and level are presented in Appendix VII, Part I. The debitage was sorted into the following categories:

I. Primary Flakes
   - A. Cortex Platform
     1. Modified
     2. Trimmed
   - B. Single Facet Platform
     1. Modified
     2. Trimmed
   - C. Other Platform Types
     1. Modified
     2. Trimmed

II. Secondary Flakes
   - A. Cortex Platform
     1. Modified
     2. Trimmed
   - B. Single Facet Platform
     1. Modified
     2. Trimmed
   - C. Small Multiple Facet Platform
     1. Modified
     2. Trimmed
   - E. Lipped
     1. Modified
     2. Trimmed

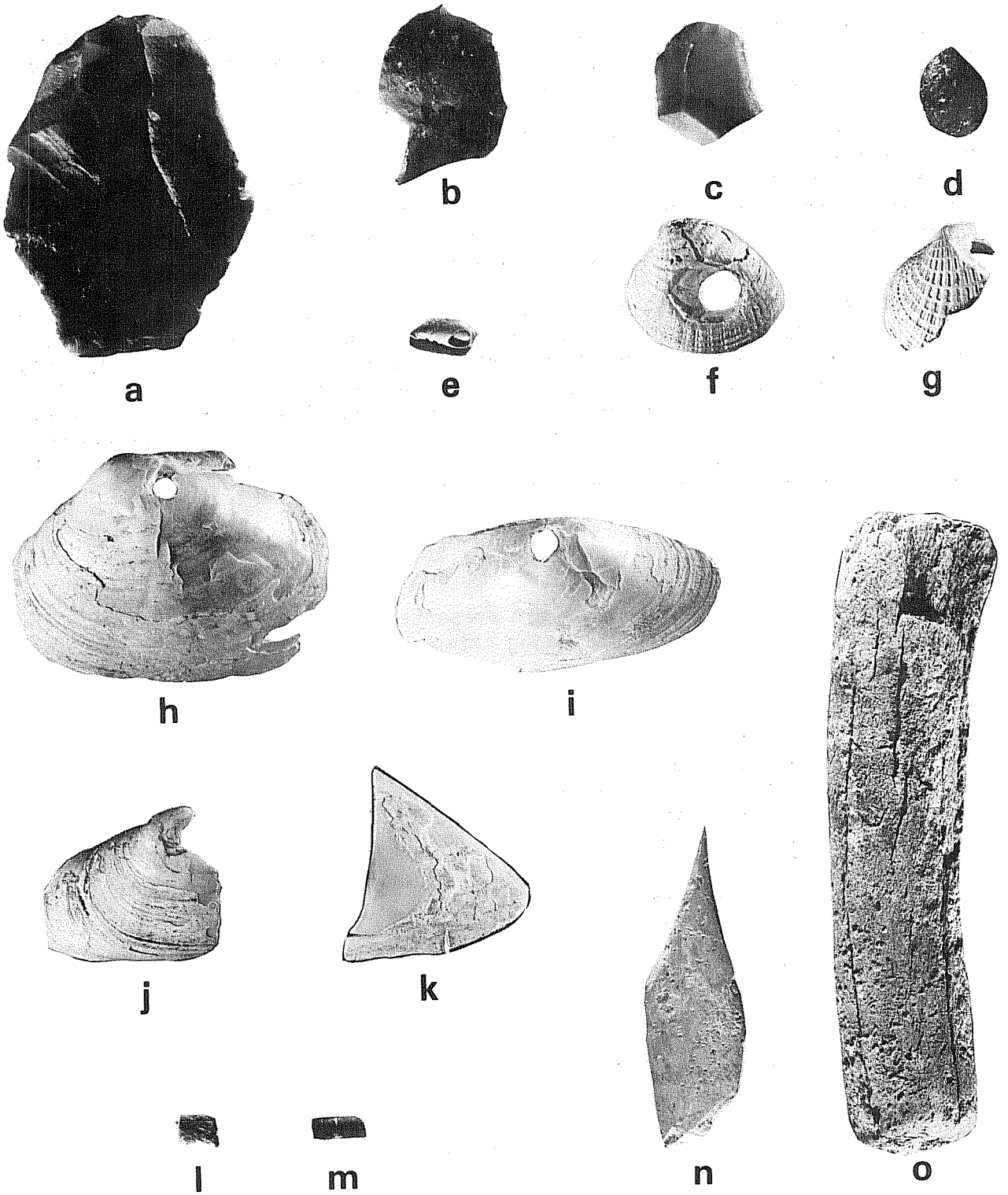


Figure 23. **Phase II Excavations: Trimmed Flakes, Asphaltum, Modified Marine Shell, Modified Mussel Shell, Modified Bone, and Modified Antler.** a-c, trimmed flakes; d, asphaltum; e, marine gastropod shell bead; f-g, modified bivalve shells; h-k, modified mussel shell; l-m, bone beads; n, bone awl; o, modified antler.

III. Tertiary Flakes
  A. Single Facet Platform
    1. Modified
    2. Trimmed
  B. Small Multiple Facet Platform
    1. Modified
    2. Trimmed
  C. Large Multiple Facet Platform
    1. Modified
    2. Trimmed

IV. Chips
  A. Cortex
    1. Modified
    2. Trimmed
  B. Partial Cortex
    1. Modified
    2. Trimmed
  C. No Cortex
    1. Modified
    2. Trimmed

V. Chunks
  A. Cortex
  B. Partial Cortex
  C. No Cortex

Hall, Black, and Graves (1982:363-365) should be consulted for definitions of the various terms used in the debitage classifications.

GROUND STONE ARTIFACTS

The ground stone artifacts consist primarily of modified sandstone pieces, although one specimen each of modified quartzite and satin spar gypsum was also recovered. The majority of the specimens exhibit smoothed surfaces which are presumably the result of grinding or abrading activities. Other pieces bear grooves etched into one or more surfaces. Provenience is presented in Appendix II, Table 19. These items have been grouped into several categories established during Phase I (Hall, Black, and Graves 1982: 372).

Modified Sandstone (24 specimens)

Sandstone occurs in outcrops of Eocene Jackson Group, a geologic formation found near the western portion of the reservoir (**ibid.**:372). Modified specimens have at least one smoothed surface and can be classified as either manos or metates (Groups 1 and 2). A smaller group consists of sandstone fragments which have been grooved (Group 3).

Group 1. Smoothed Slabs and Slab Fragments with Flat and/or Concave Faces (20 specimens)

Group 1 modified sandstone specimens consist of sandstone slabs, commonly referred to as metates. These slabs were probably used as a base on which seeds, nuts, and the like were ground or processed.

Form 2. Medium (two specimens)

Specimens within modified sandstone Group 1, Form 2 range from 11.0-13.5 cm in length and average 2.9-4.8 cm in thickness. Both specimens are fragmentary, and one (Lot No. 313) has been heat fractured. Five pieces were recovered and reconstructed. One entire face was extensively ground. This fragment retains only a portion of the basin. The other specimen (Lot No. 271) is also fragmentary. Shaping is evident along two edges with both faces showing minor modification by grinding.

Form 3. Small (18 specimens)

Group 1, Form 3 specimens are fragments of larger sandstone slabs which exhibit ground surfaces on one or both surfaces. Length and width dimensions range from 2.3-8.3 cm; thicknesses range from 0.5-5.4 cm.

Group 2. Subcircular to Angular Pieces with Flat and/or Concave Faces (11 specimens)

Specimens in Group 2 modified sandstone are subcircular to angular in outline. These specimens are typically termed manos and exhibit smoothed faces which are either flat or slightly convex. The edges are often smoothed and may be intentionally shaped. A mano is a hand-held implement used in grinding or pulverizing plant or other food items on a metate.

Form 1. Wedge-Shaped Cross Section (five specimens)

The more complete specimens in Group 2, Form 2 modified sandstone vary in outline from rectangular to subtriangular and are wedge shaped in cross section (Fig. 24,a). Two specimens have two ground surfaces, while the other three have only one ground surface.

Form 2. Lenticular (two specimens)

Group 2, Form 2 specimens are subcircular in outline with biconvex cross sections. The edges appear shaped and smoothed. Both faces of one specimen have been smoothed, while only one face on the other specimen has been modified.

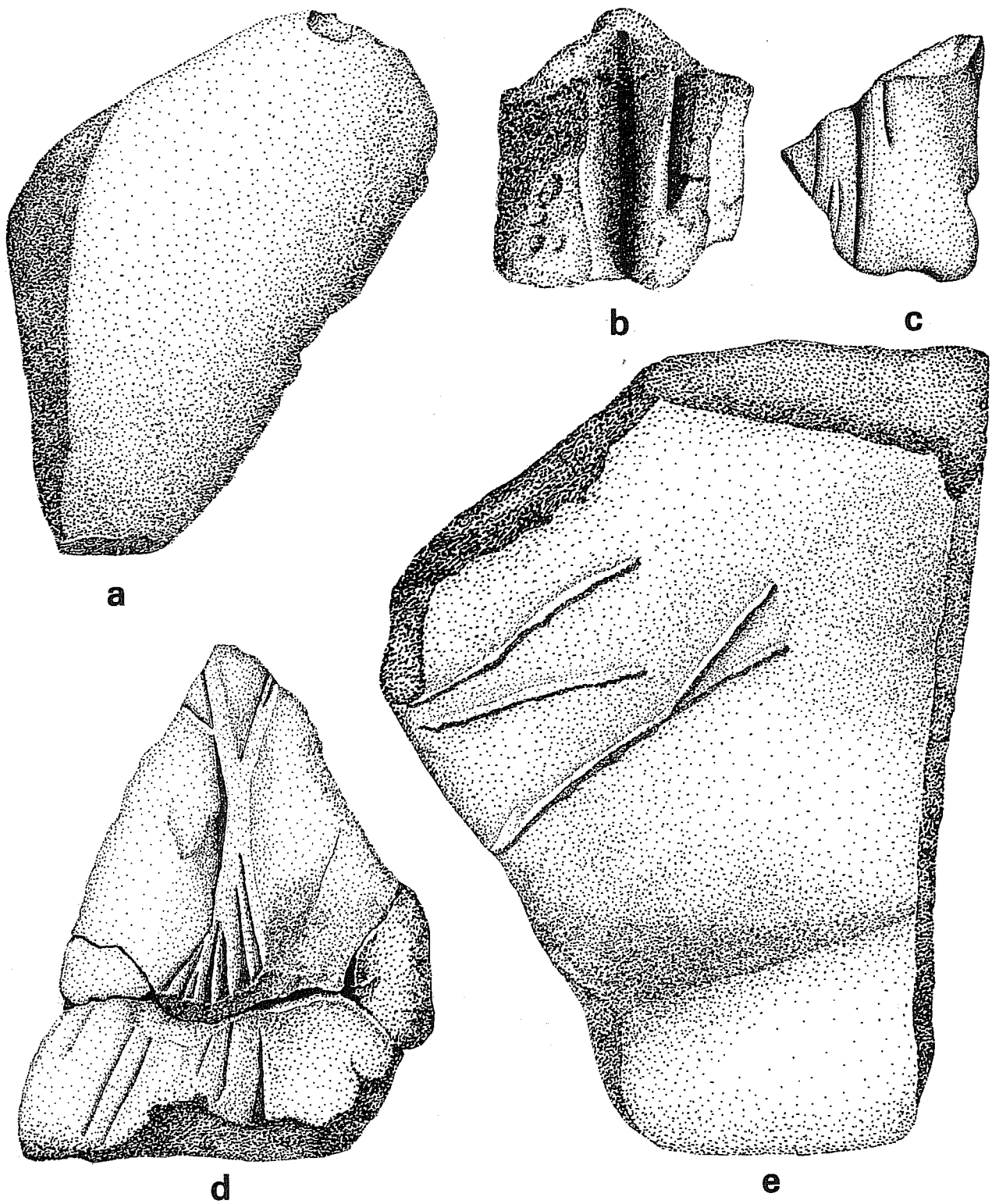


Figure 24. **Phase II Excavations: Modified Sandstone.** a, Group 2, Form 1 (wedge-shaped mano); b-e, Group 3 (grooved pieces).

Form 3. Mano Fragments (four specimens)

Group 2, Form 3 specimens are apparently fragmented manos. These small pieces exhibit one or more smoothed surfaces as well as smoothed edges.

Group 3. Grooved Pieces (four specimens)

Group 3 modified sandstone specimens are characterized by a series of grooves worked into one or more surfaces. The U-shaped or V-shaped grooves could have resulted from several activities, including smoothing the edges of bifaces during the biface-reduction process and/or the sharpening of pointed bone tools (Hester 1980:115). Additional information on grooved stones in McMullen County can be found in Jones (1981).

The specimens range in length from 4.6-14.0 cm and average 2.0-4.3 cm in thickness. One triangular specimen (Lot No. 204) was broken into four pieces and has been reconstructed. One face has two shallow grooves that crisscross each other; the opposite face has two shallow grooves that are parallel to each other (Fig. 24,d). One small, thick sandstone fragment (Lot No. 313) has four grooves (Fig. 24,b). One face has a deep, wide, V-shaped groove, while the opposite face has a similar groove with a smaller groove parallel to it. The fourth groove appears along one edge.

The largest specimen (Lot No. 273) has four grooves on one face. Two lines crisscross, while the other two do not intersect (Fig. 24,e). The broken edge has four lightly etched parallel lines. The smallest specimen has three parallel grooves on one face (Fig. 24,c).

Modified Quartzite (one specimen)

One small fragment of modified quartzite appears to have been used as a mano. Both surfaces and the edges have been smoothed.

Satin Spar Gypsum (one specimen; Fig. 21,b)

Gypsum occurs in the Frio Formation which runs through the middle portion of the Choke Canyon Reservoir (Hall, Black, and Graves 1982:385). The cobbles are rodlike, a result of being stream rolled in the Frio River gravel bars. A total of 14 specimens was found during Phase I investigations. The ends are usually battered and smoothed. It is assumed that they were utilized by aboriginals, but the specific use remains unknown. Gypsum rods were included in several caches at 41 LK 28, an Archaic cemetery located east of Choke Canyon (**ibid.**). The specimen recovered from 41 LK 201 was found below materials designated as Middle Archaic components.

SHELL ARTIFACTS

Both marine shell and river mussel shell were modified, primarily for decorative purposes, by the prehistoric inhabitants of 41 LK 201. The marine

shell was probably derived from the nearby coastal region, while the river mussel shell was locally available. Because marine shell is a very durable type of shell, intentional alteration is fairly easy to recognize. Mussel shell, however, is very fragile. Intentional modification of this type of shell can either be obscured by or mistaken for natural postdepositional alteration.

MARINE SHELL (five specimens)

Several varieties of marine shell were recovered from Area B. Two species of marine shell were recovered during Phase II, while two other types were recovered during the UTSA Field School investigations. The modified specimens were apparently used as pendants or perhaps for other decorative purposes. None of the marine shells were of the size or shape to facilitate use as a tool.

Marine Gastropod Shell Bead (one specimen)

One small marine gastropod shell was recovered from Level 15 (97.95-97.85 m) of Unit N500 E996. It has a perforation through the outer whorl near the aperture, presumably to facilitate stringing (Fig. 23,e). The specimen has been identified as **Prunuum (leptegouana) apicina** (Andrews 1977:155). Other perforated shells of this species were recovered from the following Choke Canyon sites:

Phase I (see Hall, Black, and Graves 1982:388)	Phase II (Hall, Hester, and Black 1986:335)
41 LK 87, Level 1 (0-10 cm)	41 LK 8, Level 5 (99.70-99.60 m)
41 MC 55, Level 9 (80-90 cm)	41 LK 8, Level 8 (99.40-99.30 m)
	41 LK 51, Level 13 (98.60-98.50 m)

This type of shell bead was recovered from Archaic occupational zones at the majority of the sites.

Perforated Bivalve Shells and Fragments (four specimens)

Four bivalve shell specimens were recovered from Level 3 of adjacent units in Area B. Two shells, one complete and one fragment, have been perforated (Fig. 23,f-g). Two small fragments exhibit no alteration but are presumed to be shattered fragments broken during the alteration process of complete bivalves. None of the three fragments fit together. All four specimens have been identified as **Chione cancellata** (Andrews 1977:244).

Lot 271--Two specimens were recovered from Level 3 (99.15-99.05 m) of Unit N499 E997. One is a complete half of a bivalve with a hole that has been punched from the interior side of the shell (see Fig. 23,f). The irregular edges of the perforation were not ground smooth. The entire surface of the shell is eroded and smoothed; all exterior surface ridges have been eliminated. The smaller fragment is not as eroded and appears unaltered.

One fragment of modified mussel shell was also associated with these two marine fragments.

Lot 255--Two fragments were recovered from Level 3 (99.15-99.05 m) of Unit N498 E998. The larger fragment retains the umbo and one lateral edge. Near the umbo is a perforation which was punched from the interior (Fig. 23,g). This action may have broken the shell. This shell is worn smooth. A smaller, unaltered fragment was also recovered.

Coral (one specimen)

According to the field notes, a coral fragment was observed in Level 13 (98.15-98.05 m) of Unit N500 E997. The specimen was not available for laboratory analysis.

Discussion

Marine shells, usually modified, were recovered from several other sites in the Choke Canyon Reservoir area. The site, as well as the types of shell, are listed below. The majority of these shells were perforated or shaped as pendants.

Phase I (see Hall, Black, and Graves 1982:387-388)

41 LK 8	conch columella bead blank
41 LK 31/32	gastropod bead
41 LK 67	conch columella gouge
41 LK 75	conch columella
41 LK 87	gastropod bead
41 MC 55	grooved and snapped conch whorl fragment
41 MC 55	gastropod bead

Phase II (Hall, Hester, and Black 1986:335)

41 LK 8	gastropod beads (2)
41 LK 14	bivalve fragment
41 LK 51	gastropod bead
41 LK 51	bivalve fragment
41 LK 250	conch or whelk shell tabular bead
41 MC 296	conch bead
41 MC 296	gastropod bead
41 MC 296	bivalve fragment

Hester (1970:87-88) reported on the occurrence of marine shell species (Heart cockle, Sunray clam, conch) at several sites in Dimmit, Zavala, and Webb Counties in southwest Texas, approximately 160 to 200 miles west of their natural habitat. Hester suggested that (a) the prehistoric groups of south Texas occasionally roamed as far east as the Gulf coast and acquired the marine shells; (b) traded with coastal peoples for shell; or (c) obtained the shell items by way of an intermediary trader or group. In the past decade or so, other sites in south Texas with other types of marine shell species have been recorded. Marine shell did find its way to prehistoric groups throughout south Texas, but the means of dissemination from the Texas coastal region remains conjectural.

The presence of marine shell as well as the occurrence of lumps of asphaltum and asphaltum-decorated or -mended pottery within the interior of southern Texas implies some degree of extra-regional contact with coastal groups. Campbell and Campbell (1981) have recently conducted ethnohistoric research

on historic Indian groups in southern Texas. Their endeavors have provided information regarding interaction among several aboriginal groups. From Cabeza de Vaca's journal the authors ascertained that at least two interior groups had contact with coastal groups. An inland group, the Avavares, visited a coastal group known as the Fig People where they saw two Spanish shipwrecked survivors (**ibid.**:25). Another group in the interior, the Anegados, bartered with the Camoles, a coastal group, for clothing and weapons salvaged from Spaniards who were slain after their barge was shipwrecked (Campbell and Campbell 1981:12). The Anegados apparently traveled to the coastal region because they reported to Cabeza de Vaca that the remains of the barge could still be seen along the shoreline (**ibid.**). Cabeza de Vaca is known to have served as a trader among the Indians, although his experiences as such apparently took place prior to the time he reached south Texas (Campbell and Campbell 1981:20).

Table 8 provides a list of prehistoric sites in south Texas (excluding counties with coastal shorelines where marine shell occurs naturally) where marine shells were recovered in artifact assemblages. It should be noted that Hall (1981:214-222) recently produced a distributional study of Archaic-age marine shell artifacts in an 80-county region of central, eastern, and coastal Texas.

MUSSEL SHELL (four specimens)

Large quantities of mussel shell were found throughout most of the deposits at 41 LK 201. Mussel shells were primarily collected as a food source, and the discarded shells are found at most sites throughout Texas. The lustrous, easily modified shells were, however, occasionally shaped and/or perforated and used as pendants.

Several modified mussel shells were present at 41 LK 201. Shells with perforations and several with obvious modified (cut, ground, and smoothed) edges were recovered. The fragile nature of the mussel shell prevented recognition or confirmation of other edge-altered shell fragments. Hall (Hall, Black, and Graves 1982:388) has pointed out that shells can be accidentally altered during both excavation and screening procedures. Additionally, the shell is constructed of thin laminae which can obscure indications of abrasion or wear (**ibid.**).

Two, and possibly three, shells were perforated. The perforations were placed near the umbo or hinge portion of the shell. One specimen (Lot No. 179) has been drilled from the interior side of the shell (Fig. 23,h). Another shell (Lot No. 305) has apparently been punched from the interior side (Fig. 23,i). A third shell (Lot No. 271) is fragmentary and appears to have been split longitudinally (Fig. 23,j). The broken edge has been smoothed along the interior edge. Another fragment (Lot No. 237) is somewhat triangular in outline with two smoothed edges. A notch has been cut into one edge (Fig. 23,k).

The perforated mussel shells, like the perforated marine shells, are presumed to represent pendants or other decorative items. The function of the edge-altered mussel shells remains speculative. They may represent discarded

TABLE 8. DISTRIBUTION OF MARINE SHELL AT SOUTH TEXAS SITES

County	Shell/Type Description	Reference
BEXAR		
41 BX 1	Conch pendants	Paul Lukowski n.d.
41 BX 300	Olivella bead	Paul Katz, personal communication
San Antonio area	Conch columella bead	Greer 1977
San Antonio area	Conch pendant and bead	McReynolds 1982
BROOKS		
Unspecified location	Unspecified	Al McGraw, personal communication
DEWITT		
Eastern sector	Conch pendants	Hudgeons and Hester 1977
41 DW 243	Sunray clam	Schmiedlin 1981
DIMMIT		
Hines Ranch	Perforated heart cockle	Hester 1970
41 DM 30	Heart cockle	Hester 1970
Unspecified location	Conch disc beads	Hester 1970
Unspecified location	Conch pendants	Hester 1970
DUVAL		
Unspecified location	Unspecified	Al McGraw, personal communication
Unspecified location	Unspecified	Bromley F. Cooper, personal communication
GOLIAD		
41 GD 4	Heart cockle	Hester and Parker 1970
JIM WELLS		
41 JW 8	Conch bead	Hester 1977
LIVE OAK*		
41 LK 28	Conch ("lightning whelk" pendants) Conch ("fighting conch") Conch columella sections Sea pens (**Atrina** sp.) Shark teeth	Hall n.d.
41 LK 85	Conch pendant	Lynn, Fox, and O'Malley 1977
Herring site	Conch columella gouge	House and Walper 1969
MCMULLEN*		
Western sector	Conch pendant	Bromley F. Cooper collection, CAR-UTSA
	Conch columella "pick"	Bromley F. Cooper collection, CAR-UTSA
STARR		
41 SR 251	Oliva shell tinkler	Mokry 1979
41 SR 136	**Nostia ponderosa**	Mokry 1979
Unspecified location	Conch ornaments	Hester 1970
UVALDE		
41 UV 60	Unspecified	Weir and Doran 1980
VICTORIA		
41 GD 30B	Sunray clam	Fox, Black, and James 1978
41 GD 30B	Sunray clam, cut and smoothed	Fox 1979
WEBB		
Unspecified location	Conch disc beads Conch pendants	Hester 1970 Hester 1970
ZAVALA		
41 ZV 14	Sunray clam cutting or scraping tool	Hester 1970; Hester and Hill 1972

*See Marine Shell discussion in the text for other Live Oak and McMullen County sites.

portions of mussel shells from which pendant preforms were cut and removed. Provenience of specimens is provided in Appendix II, Table 20.

BONE AND ANTLER ARTIFACTS

Only four modified bone and antler objects were recovered during the Phase II excavations. A more varied array of bone artifacts was recovered during the UTSA Field School excavations and are discussed in Part II of this report. Provenience and metric data for the Phase II bone artifacts are provided in Appendix II, Table 21.

Two bone beads were recovered from controlled excavations during Phase II (Fig. 23,l,m). Both ends of the smaller bead were cut, snapped, and ground smooth. Four bone beads of similar size were recovered during excavations carried out by the UTSA Field School. The other bead was recovered from Level 11 of Area A. It has been burned. The ends are cut, snapped, and ground smooth. The surface is highly polished.

A bone awl and an antler flintknapping tool were recovered from the area of the water-screening operation. The bone awl was fashioned from a split bone (Fig. 23,n). The pointed or working end of the tool is highly polished and smoothed. The antler billet has a weathered surface (Fig. 23,o). The butt or wider end is extremely eroded, and all evidence of wear has been removed. The anterior end has been cut and ground smooth. This antler billet is unique to the Choke Canyon Reservoir investigations. Although antler tines were recovered from several sites, this specimen represents the only billet recovered during both phases of work in the Choke Canyon area.

CERAMICS

During the Phase I investigations in the Choke Canyon region, 16 pottery-bearing sites were located. Black (1982:390-453) conducted a detailed analysis of the sherd sample and provided extensive background information and experimental and replicative data. During Phase II, an additional nine ceramic-related sites were recorded. As a result of the three excavation phases carried out at 41 LK 201, a total of 1563 sherds has been recovered, the largest sample obtained from a single site in the Choke Canyon project area.

A total of 51 sherds was recovered during Phase I investigations at 41 LK 201 and was subsequently analyzed by Black (**ibid.**:423-428). These sherds are predominantly bone tempered with burnished exteriors and poorly smoothed interiors. The similarities noted in the sandy paste of most sherds suggest a common clay source. Applied substances include a red decorative film and traces of asphaltum. Based on inclusion content, surface finish, and applied substances, 12 subgroups were established. The sherds represent bowl or jar fragments, a possible olla, and pipe bowl fragments.

During Phase II investigations at 41 LK 201, a total of 36 sherds was recovered, while 1476 ceramic fragments were collected during the UTSA Field School excavations. The analysis of the two samples will generally be based

on the criteria established by Black (1982:390-404). Black defined seven groups for Phase I, with each group ideally representing fragments of a single vessel or sherds with identical paste characteristics. Additional portions of several of these vessels were recovered during the Phase II and UTSA Field School excavations. Therefore, group numbers assigned to these sherds correspond to Phase I group numbers. Additional groups were assigned sequential numbers beginning with Group 8. The UTSA Field School ceramic analysis is in Part II of this report.

Although the sherds from Phase II number only 36, they are very unique and informative. A few rim sherds are present, but body sherds are the most prevalent. Two groups correspond to Groups 2 and 3 from Phase I, but now with revised descriptions, while a third group, Group 8, was established. The remaining sherds, based on surface features and paste compositions, do not appear to fit within previously defined groups and are placed in a miscellaneous category. Provenience information is provided in Appendix II, Table 22. Definitions for the ceramic technology used in the descriptions can be found in Black (1982:395-404).

GROUP 2. (olla with fugitive red film, bone tempered, highly burnished) Revised Description

Total number of sherds:	10.
Vessel fragments:	2 rim, 4 neck, 4 body.
Sherd thickness:	0.3-0.45 cm.
Vessel dimensions:	rim diameter, 7 cm. neck diameter, 6 cm.
Paste:	silty paste matrix with profuse bone, occasional subangular sand grains.
Core:	>2/3 thickness, dark gray.
Comments:	Nine sherds in Group 2 make up two areas of a vessel--six rim and neck sherds that fit together and three body sherds that fit together. Each group will be described separately but are believed to be portions of the same vessel. The rim and neck sherds are obviously portions of an olla, a globular vessel with a constricted neck and an outward flaring rim. The length of the reconstructed rim and neck fragment is 5.7 cm. The lower portion of the vessel appears to be represented by a second group of three sherds that fit together and were found with the rim and neck sherds. A tenth sherd is obviously from the same vessel but does not fit with either of the two reconstructed sections. A large group of body sherds collected during the UTSA Field School excavations are also believed to be part of this olla. They are described as Group 2 in Part II of this report and illustrated in Figure 38,a.

The exterior of the rim and neck segment has been floated, smoothed, and highly burnished. A band of fugitive red film (3-cm wide) is present on the dark tan exterior surface. It is thickest along the rim, but traces are obvious on all of the neck sherds. Vertical burnishing marks are present on the neck of the vessel.

The interior of this same segment has been smoothed and has a matte gray surface similar to the one described in Group 2 of the Phase I ceramics. Black (1982:425) states that this is probably a lightly brushed surface that has been incompletely oxidized. A very distinct band of fugitive red film (1.7- to 2.2-cm wide) extends along the rim. This red band is thicker and darker in color than the bright red coloring on the exterior.

The upper portion has thin walls and is well made. All evidence of coiling has been obscured by smoothing. Two portions of the lip are present. One lip edge exhibits a tapering effect, while the other portion of the lip has been somewhat flattened.

The exterior of the three body sherds has been highly burnished. No traces of fugitive red filming are obvious. The interior has the same distinctive gray surface as well as traces of wet brush marks. A tenth sherd has been placed within Group 2. It exhibits the distinctive gray interior; but unlike the three other body sherds, this sherd has fugitive red film on the exterior surface.

GROUP 3. (moderately bone tempered with sandy paste, asphaltum edge mending) Revised Description

Total number of sherds: 3.

Sherd fragments: 3 body.

Sherd thickness: 0.45-0.50 cm.

Paste: sandy with moderate bone.

Core: >2/3 thickness, dark gray.

Comments: Group 3 consisted of three subgroups according to the Phase I analysis (Black 1982:425-426). Two sherds from Phase II appear to be similar to Groups 3A and 3B.

Group 3A (two sherds)

Group 3A specimens are two thin-walled body sherds with floated, burnished exteriors. The interiors have also been poorly smoothed.

Group 3B (one sherd)

The one Group 3B sherd has a burnished exterior and an uneven interior with wet brush marks. The most distinguishing characteristic is the presence of asphaltum along two opposing edges. Traces of it extend onto the broken edges, an indication of asphaltum edge mending. The sherd is very similar to the sherd described in Group 3B for the Phase I ceramics by Black (1982:Fig. 91,d).

GROUP 8. (burnished, profuse bone, fugitive red film, traces of an unidentified black substance)

Total number of sherds: 6.

Sherd fragments: 6 body.

Sherd thickness: 0.4-0.7 cm.

Paste: sandy with profuse bone.

Core: >2/3 thickness, dark gray.

Comments: Two sherds fit together forming one large ceramic fragment (6.3 x 7.4 cm). This segment was then joined with two other sherds recovered during the UTSA Field School excavations (see Part II of this report, Ceramics, Group 8). This fire-clouded fragment has been highly burnished on the exterior with the parallel burnishing marks highly visible. Traces of a black substance are present on the exterior of four sherds. Using the "Lewis Method" (Black 1982:445), this substance was chemically tested, and it was determined that it is not asphaltum. Traces of fugitive red are present on five of the sherds.

The interior portions of these sherds range in color from tan to dark gray. The interiors have been poorly smoothed. Fire clouding and coil lines are visible on the largest sherd. A thick, black substance is visible on the interior of the smallest sherd. Chemical tests determined that it was not asphaltum.

MISCELLANEOUS SHERDS (17 sherds)

Seventeen small sherds do not appear to fit within defined groups. Only one of these sherds will be described in more detail. A rim sherd (Lot No. 221) has a slightly rounded lip with two notches that run perpendicular to the lip edge. Whether or not this was an intentional decorative technique remains speculative. The exterior of the sherd is highly burnished.

MISCELLANEOUS MATERIALS

The following items do not fit within previously described categories. The asphaltum and ocher are presumed to be associated with aboriginal activities. The other items cannot be definitely linked to the prehistoric occupations but are worthy of description.

OCHER (eight samples)

Small (<1 g) chunks of both yellow and red ocher were found at 41 LK 201. The chunks have a chalky consistency. They were recovered from the following areas:

Lot No.	Area	Unit	Level	Elevation	Count	Color
260	B	N498 E998	8	98.65-98.55 m	1	Red
261	B	N498 E998	9	98.55-98.45 m	1	Red
272	B	N499 E997	4	99.05-98.95 m	2	Yellow
278	B	N499 E998	3	99.15-99.05 m	1	Yellow
295	B	N500 E997	4	99.05-98.95 m	1	Yellow
334	B	N498 E997	11	98.35-98.25 m	1	Red
406	B	N498 E997	17	97.75-97.65 m	1	Yellow
407	B	N498 E997	18	97.65-97.55 m	1	Yellow
409	B	N498 E998	17	97.75-97.65 m	1	Yellow

JASPER (one specimen)

One red jasper pebble was recovered from Level 10 (98.45-98.35 m) of Unit N497 E998. The significance of the pebble at the site is unknown, but because of its uniqueness its presence is noted here. Measurements are: length, 3.1 cm; width, 1.9 cm; thickness, 1.6 cm; weight, 13.9 g.

ASPHALTUM

A total of 1.2 g of asphaltum, including one large teardrop-shaped chunk, was recovered from Level 11 (97.75-97.65 m) of Unit N490 E1043 (Fig. 23,d). This sample, along with marine shells recovered from both the Late Archaic and Late Prehistoric deposits, suggests contact with coastal groups.

MUD DAUBER'S NEST FRAGMENTS (two specimens)

A fragment of a mud dauber's nest was recovered from Unit N491 E1043 at Level 18 (97.05-96.95 m) in Area A. Another fragment was recovered from Area B at Level 5 (98.95-98.85 m) in Unit N499 E997. Hall (Hall, Black, and Graves 1982:386) has suggested that the presence of these items might represent indirect evidence of aboriginal structures. They might also be indicative of food gathering activities.

IMPRESSED FIRED CLAY NODULES (two specimens)

The fired clay nodules were washed out of the bank of the slough by water-screening activities. Each nodule exhibits one or two distinct impressed marks. The width of the concave depressions is approximately 3.1 cm. One specimen weighs 665 g, while the other weighs 991 g. It has been suggested that these marks resulted from the use of digging sticks used to pry the clay loose during aboriginal times, or they could be root impressions.

HISTORIC ARTIFACTS

Historic artifacts were recovered from each of the excavations carried out at 41 LK 201. During Phase I, historic artifacts and sandstone blocks were generally confined to an area south of the excavated units (Hall, Black, and Graves 1982:81, and also see Fig. 9, page 71). The sandstone blocks suggest that a historic structure was present in this vicinity sometime between 1860 and 1880. East of 41 LK 201 and on the opposite side of the slough is site 41 LK 197, a historic complex identified as a 20th-century Anglo-American ranch headquarters (**ibid.**:82). It is assumed that the older items recovered from the excavated areas were derived from early ranching activities. A few artifacts date to more recent times.

The historic artifacts recovered are unidentifiable metal fragments, one round nail, one ceramic fragment, one glass button, and one cartridge case (post-World War II).

FAUNAL REMAINS

VERTEBRATE FAUNAL REMAINS

Site 41 LK 201 represents one of the few sites tested during Phase I that contained substantial quantities of vertebrate faunal remains. The presence of preserved bone was a primary consideration in returning to the site during Phase II. The total assemblage from 41 LK 201 is one of the largest and most informative collections of vertebrate faunal remains recovered from a single site in south Texas. Faunal identifications and analyses were conducted by Dr. D. Gentry Steele of Texas A&M University. Dr. Steele's research resulted in an assessment of the structure of the bone assemblage, dietary patterns, hunting and harvesting patterns, seasonality of the site, environmental reconstruction, and description of taxa (Appendix V).

In most cases, only the bone that was collected from the 1/4-inch screens was analyzed. Large quantities of microfauna were collected in the fine-screened samples, but project funds did not permit a detailed analysis of this bone. Therefore, only a sample of the fine-screened material was analyzed (Appendix VI). Also, in Appendix VI, the value of the fine-screening technique at south Texas prehistoric sites is reviewed.

The faunal remains collected from 41 LK 201 indicate a broad spectrum of animal resources was available to prehistoric inhabitants (see Table 9). Area A, Horizon 1 (Levels 1-5) contained elements of unidentifiable bird, spiny lizard, unidentifiable snake, unidentifiable turtle, box turtle, mud turtle, unidentifiable artiodactyl, white-tailed deer, unidentifiable **Canis** sp., jackrabbit, cottontail rabbit, muskrat, and squirrel. In Horizon 2 (Levels 6-9), faunal remains consisted of unidentifiable bird, wild turkey, unidentifiable snake, unidentifiable turtle, box turtle, mud turtle, white-tailed deer, unidentifiable **Canis** sp., bobcat, jackrabbit, cottontail rabbit, cotton rat, and squirrel. In Horizon 3 (Levels 10-14) elements of catfish, unidentifiable turtle, white-tailed deer, jackrabbit, cottontail rabbit, wood rat, harvest mice, and cotton rat were recovered. Horizon 4 (Levels 15-19) contained unidentifiable turtle, unidentifiable artiodactyl, bison, white-tailed deer, badger, cottontail rabbit, and cotton rat.

In Area B, elements of gar, catfish, freshwater drum, alligator, unidentifiable snake, unidentifiable turtle, box turtle, unidentifiable artiodactyl, bison, white-tailed deer, peccary, raccoon, armadillo, jackrabbit, cottontail rabbit, wood rat, pocket mouse, cotton rat, and squirrel were identified from Horizon 1 (Levels 1-5). Bison occurs in three separate units in these upper levels. The presence of peccary (a left calcaneous) was recorded in Level 4 of Unit N497 E996. Javelina has been documented at only a few Late Prehistoric sites in south Texas (Hall, Black, and Graves 1982:244; Black n.d.). The presence of armadillo in Level 2 of Unit N500 E998 is no doubt due to intrusion from the surface.

In Horizon 2 (Levels 6-9), a decrease in identifiable bone is obvious and is due, in part, to the discarding of certain levels within this zone (Table 1). However, the eastern block of units in Area B was excavated without discarding levels, and identifiable bone was scarce in these levels. Catfish, unidentifiable bird, unidentifiable turtle, pygmy mice, pine vole, harvest mice, cotton rat, and squirrel comprise the bone assemblage from Horizon 2.

Horizon 3 (Levels 10-13) contained catfish, freshwater drum, unidentifiable bird, unidentifiable turtle, Texas tortoise, unidentifiable artiodactyl, peccary(?), jackrabbit, cottontail rabbit, pocket mouse, pine vole, and cotton rat. The tentative identification of peccary (javelina) in Level 10 in Unit N497 E997 is based on tooth enamel fragments (Appendix V). Horizon 4 (Levels 14-18) contained unidentifiable bird, jackrabbit, and cotton rat fragments, while freshwater drum was the only identifiable species for Horizon 5 (Levels 19-25).

Area C, partially excavated in 5-cm levels, contained gar, catfish, freshwater drum, unidentifiable snake, unidentifiable turtle, unidentifiable artiodactyl, jackrabbit, cottontail rabbit, and wood rat.

TABLE 9. DISTRIBUTION OF VERTEBRATE FAUNAL REMAINS BY HORIZON FOR PHASE II EXCAVATIONS

	Gar	Catfish	Freshwater Drum	Bird (I)	Wild Turkey	Alligator	Spiny Lizard	Snake (I)	Turtle (I)	Box Turtle	Mud Turtle	Texas Tortoise	Artiodactyl (I)	Bison	White-Tailed Deer	Peccary	*Canis* sp. (I)	Bobcat	Badger	Raccoon	Armadillo	Jackrabbit	Cottontail Rabbit	Mexican Spiny Pocket Mouse	Hispid Pocket Mouse	Pygmy Mouse	Pine Vole	*Neotoma* sp. (I)	Muskrat	Harvest Mouse	Hispid Cotton Rat	Squirrel
Area A, Horizon 1 (Levels 1-5)				×			×	×	×	×	×		×		×		×					×	×						×			×
Area A, Horizon 2 (Levels 6-9)				×	×			×	×	×	×				×		×	×				×	×								×	×
Area A, Horizon 3 (Levels 10-14)		×							×						×							×	×					×		×	×	
Area A, Horizon 4 (Levels 15-19)									×				×	×	×				×				×								×	
Area B, Horizon 1 (Levels 1-5)	×	×	×			×		×	×	×			×	×	×	×				×	×	×	×	×	×			×			×	×
Area B, Horizon 2 (Levels 6-9)		×		×					×																	×	×			×	×	×
Area B, Horizon 3 (Levels 10-13)		×	×	×					×			×	×			×						×	×	×			×				×	
Area B, Horizon 4 (Levels 14-18)				×																		×									×	
Area B, Horizon 5 (Levels 19-25)			×																													
Area C (Levels 1-8)	×	×	×					×	×				×									×	×					×				

FRESHWATER MUSSEL SHELLS

Freshwater mussel shells (unionids) were recovered from 41 LK 201 in both the Archaic and Late Prehistoric zones. Table 10 provides counts and weights of mussel shell by area and horizon. In Area A, nine 1-m^2 units were excavated through Level 3. Beginning with Level 4 only the four southeastern units received additional work (see Table 1). This accounts for the reduction in totals in Horizons 2-4. Substantial amounts of mussel shell were found near Feature 5 in Levels 12 and 13 (see Table 3).

In Area B, twelve 1-m^2 units were excavated with Unit N500 E998 designated a fine screen unit. Large quantities of mussel shell were present, particularly in Horizon 1. The amounts decreased in Horizons 2 and 3 and were few in number in Horizon 4. Horizon 4 contained three burned rock features with small quantities of mussel shell present in the levels surrounding these features. Area C and the northernmost units of Area B contained the greater quantities of mussel shell. The proximity of these units to the slough may account for the larger quantities of mussel shell.

Freshwater mussels were a readily available and easily obtainable food source in the Choke Canyon region. As a food item, freshwater mussels have a protein content of 7 to 12% (Hall, Black, and Graves 1982:470). The Frio and Nueces Rivers and their tributaries contained several species of unionids during prehistoric times. An extensive study of mussel shells collected during Phase I was conducted by Murray (1982:541-555). The most common species identified from Live Oak County sites were **Lampsilis anodontoides, Lampsilis** sp., and **Cyrtonaias tampicoensis (ibid.**:547). **Lampsilis** sp. inhabit a coarse, clean substrate with a relatively high current velocity (Brown **et al.** 1982:95). **Carunculina parva** was also present and indicates that collection of some unionids was from shallow water (Murray 1982:554). Although the unionids collected during Phase II were not analyzed and identified by species, it is assumed that the species identified for Phase I correspond to the species recovered in subsequent excavations.

LAND SNAILS

Land snail species recovered from 41 LK 201 are identified as **Rabdotus, Helicina, Polygyra,** and **Succinea.** Of these, only the **Rabdotus** species are believed to have been brought into the site by aboriginal groups and utilized as a dietary supplement. **Rabdotus** snails are an ever-present item in cultural deposits at most sites throughout south Texas (Hester 1975a, 1980; Hester and Hill 1975; Montgomery 1978). The archaeological record is corroborated by ethnohistoric accounts which record that the Mariames, a prehistoric group located near the Choke Canyon region, depended on land snails and prickly pear fruit during the summer months (Campbell and Campbell 1981:17). Recent studies indicate that **Rabdotus** snails are very high in protein (Hall, Black, and Graves 1982:470).

In south Texas, **Rabdotus** snails occur in colonies that can occupy an area equal to about one city block (Fullington and Pratt 1974:14-15). These snails are nocturnal, and during the day (except for winter months) affix themselves to plant stems "above the super-heated layer of air that forms at

TABLE 10. HORIZON DISTRIBUTION OF MUSSEL SHELL AND **RABDOTUS** SNAILS*

Area	Horizon	Provenience	Mussel Shell Count	Mussel Shell Weight	**Rabdotus** Count
A	1	N490-492 E1042, N492 E1043-1044, Levels 1-3			
		N490-491 E1043-1044, Levels 1-5	111	702	1318
A	2	N490-491 E1043-1044, Levels 6-9	35	243	129
A	3	N490-491 E1043-1044, Levels 10-14	147	602	345
		Feature 5, N490-491 E1043, Levels 12-13	1	12	-
A	4	N490-491 E1043-1044, Levels 15-19			
		N491 E1044, Level 20	52	269	154
		Feature 2, N490 E1043-1044, Levels 16-18	8	73	19
B	1	N497-500 E996, Levels 1-5	813	4728	8371
		Feature 6, N500 E998, Level 4	9	67	89
B	2	N497-500 E996-998, Levels 6-9 (several levels discarded, see Table 1)	206	1234	812
B	3	N497-500 E996-998, Levels 10-13	1079	1962	1455
B	4	N497-500 E996-998, Levels 14-18	179	530	5308
		Feature 7, N498 E996-998, Level 15			
		N499 E997-998	1	17	8
		Feature 8, N500 E996-997, Levels 16-17	1	2	71
		Feature 10, N498 E997-998, Level 18	0	1	260
B	5	N500 E996-998, Levels 19-25	2	10	426
C	-	N510 E1020-1021, Levels 1-8			
		N510 E1022, Level 1	157	690	229

*Provenience is provided, but Table 1 should be consulted as several levels were discarded, and screening procedures were not uniform for all levels. These circumstances have affected the recovery of items in both Areas A and B.

ground level" (**ibid.**), or they seek cover under rocks and logs. This practice would allow them to be easily gathered by aboriginal peoples. Because these snails are capable of surviving droughtlike conditions (Fullington and Pratt 1974; Cheatum and Fullington 1971:2), they would represent an available food source during the summer months in the south Texas region when other food resources might not be as plentiful. During the dry winter months, **Rabdotus** snails hibernate by burrowing underground (Fullington and Pratt 1974:15).

As shown in Table 10, **Rabdotus** snails were present in both Archaic and Late Prehistoric levels. Of particular interest is the **Rabdotus** concentration which was uncovered in Level 3 of several units in Area B. It is possible that these snails were cooked in the hearth identified as Feature 6. Substantial numbers of snails were also recovered from Horizon 4 of Area B which also contained three hearths (designated Features 7, 8, 10).

SUMMARY

The Phase II investigations at 41 LK 201 exposed Late Prehistoric remains overlying Archaic materials. The Late Prehistoric materials are confined to the upper four or five levels (40 to 50 cm), defined as Horizon 1. Levels lower than Horizon 1 are represented by several occupational zones which are recognized by variable amounts of cultural materials and stratigraphic separation (Hall, Black, and Graves 1982:80). Based on observations made by Hall (**ibid.**) during the Phase I analysis of 41 LK 201, the following assessments are made regarding the Archaic deposits as revealed during the Phase II investigations: (1) in Areas A and B, Horizons 3 and 4 represent Archaic components while (2) Horizon 2 in Area A and Horizons 2 and 5 in Area B appear to be relatively sterile zones containing materials derived from upper and lower horizons (Hall, Black, and Graves 1982:80).

During the Phase I analyses, the Archaic materials were defined as Late Archaic components (Hall, Black, and Graves 1982:80). As a result of the Phase II investigations of the Choke Canyon Reservoir region, it is now recognized that the lower levels of site 41 LK 201 contain both Middle and Late Archaic components. The Phase II analyses suggest that the Middle Archaic period ranges from 2500-400 B.C., while the Late Archaic period begins ca. 400 B.C. and ends around A.D. 900 (**ibid.**).

Based on current interpretations, Horizon 4 can be placed in the Middle Archaic period (Hall, Hester, and Black 1986:398-402). Radiocarbon dates of 1300 B.C. from Phase I (Hall, Black, and Graves 1982:652) and 840-820 B.C. and 720-660 B.C. from Phase II, coupled with the artifacts and the burned rock features are indicative of a Middle Archaic component as defined by Hall, Hester, and Black (1986:398-402). While Area A contained no diagnostic artifacts in Levels 15-19, one large hearth, Feature 2, was present. Levels 14-18 in Area B contained one **Pedernales**-like point (Group 1, Form 1, Specimen 5) and one distally beveled biface (Group 9, Specimen 4). Features 7, 8, and 9 were located in these levels with charcoal from Feature 8 providing the radiocarbon dates of 840-820 B.C. (MASCA corrected) and 720-660 B.C. (MASCA corrected). A **Kinney**-like point was recovered from Level 19 of Horizon 5. **Kinney** points were recently excavated at site 41 BN 63 in Bandera County and

were found associated with, and in some cases, stratigraphically below **Pedernales** points in Middle Archaic context (Thomas R. Hester, personal communication).

The Horizon 3 component is somewhat difficult to assign to either Middle or Late Archaic, since it contains elements of both, as defined by Hall, Hester, and Black (1986:399). The later years of the Middle Archaic and the Late Archaic periods are characterized by large burned rock features, distally beveled tools ("gouges," particularly those classified as Groups 3 and 4), unstemmed thin bifaces, modified and trimmed flakes, and a few stemmed dart points. **Pedernales, Morhiss,** and **Langtry** dart points occur at many Choke Canyon sites and should prove, with future intensive excavations of Middle Archaic components in south Texas, to be important Middle Archaic diagnostic forms as they are in other parts of Texas (**ibid.**). The Late Archaic period dart point diagnostics are **Ensor, Frio, Ellis, Marcos,** and **Fairland.**

Levels 10 and 11 of Horizon 3 in Area A yielded an **Ensor**-like point (Fig. 19, Group 1, Form 3, Specimen 21), a triangular thin biface (Fig. 19, Group 2, Form 2, Specimen 35), a large stemmed biface with a beveled blade (Fig. 19, Group 1, Form 1, Specimen 9), and one distally beveled tool of the **Nueces** scraper variety (Fig. 22, Group 3, Form 3, Specimen 1). Charcoal from Feature 5, the only hearth present in Horizon 3, provided a radiocarbon date of 480 B.C. (MASCA corrected). Horizon 3 in Area B contained four distally beveled tools (Fig. 22, Group 3, Form 2, Specimen 3; Fig. 22, Group 4, Specimens 4 and 5; Fig. 22, Group 9, Specimen 3). Horizon 3 apparently represents a Late Archaic occupation. The date of 480 B.C. borders on the proposed terminus of the Middle Archaic period and the beginning of the Late Archaic period. The single **Ensor** point, however, lends support to the decision to place these levels within the Late Archaic period.

Additional comments are warranted regarding the analyses of these lower levels. The few dart points recovered from 41 LK 201 during Phase II excavations have been discussed above with the exception of a **Morhiss** point (Fig. 19, Group 1, Form 2, Specimen 7) recovered from Level 6 of Area B. Horizon 2 (Levels 6-9) of Area B was a very unproductive zone with considerably less cultural material present than in Horizons 1 and 3. No other chipped stone tool forms were present in Levels 6-9 of Area B. The **Morhiss** point was not closely associated with radiocarbon-dated deposits, but occurred well above deposits dated to 480 B.C. (MASCA corrected). Excavations in Goliad County have placed these points between 1250 B.C. and 500 B.C. (Fox 1979:62). The specimen appears to be out of context in this particular situation.

The burned rock features from the Archaic levels are typical of Middle and Late Archaic sites in the Choke Canyon region (Hall, Hester, and Black 1986:399). Three such features were excavated during Phase I investigations at 41 LK 201, while four more were found during Phase II. They were primarily aggregations of burned tuffaceous sandstone, although many of the hearths also contained fire-fractured chert. Feature 2, however, represents a pit in which an intensive fire was built, presumably to roast or bake meat and/or vegetal foods. Although some fire-fractured chert and burned tuffaceous sandstone were noted, there was no apparent structure to the feature as in the other rock-constructed hearths. Burned clay and soil,

along with carbonized logs, were the remaining traces of the pit. The frequency of the hearths in the Middle and Late Archaic levels at 41 LK 201 and other sites in the reservoir indicate that they were an integral component of campsite activity. They can probably be attributed to food preparation (roasting, baking), and strongly suggest a major difference in subsistence pursuits and preparation (Hall, Hester, and Black 1986:399, 401). These large accumulations of burned rock are noticeably absent from Late Prehistoric components (**ibid.**).

The hearths not only provided charcoal samples for dating purposes but also provided charcoal samples for wood identification studies. Charred wood identifications were provided by Richard G. Holloway (Hall, Hester, and Black 1986:Appendix II). Features 5 and 7 contained samples of **Acacia** or **Prosopis** sp. (acacia or mesquite). Charcoal samples obtained for Feature 2 during Phase I were identified as **Quercus** sp. or oak (Hall, Black, and Graves 1982:653). Holloway identified the Feature 2 wood charcoal samples submitted from the Phase II excavations as **Prosopis** sp. or mesquite (Hall, Hester, and Black 1986:Appendix II). Either a discrepancy in identification exists or two types of wood were present in the same feature. Wood species identification of samples from Middle Archaic components at 41 LK 201 and 41 LK 51, particularly of **Prosopis** sp. and **Acacia** sp., indicate that elements of the brush community of the Middle Archaic period are similar to modern species (Hall, Hester, and Black 1986:402).

Faunal remains from the Archaic levels include mussel shells, land snails, and vertebrate faunal remains. Elements of fish, bird, turtle, snake, deer, bison, bobcat, badger, rabbit, and rodents were recovered. The single bison element from Level 16 of Unit N491 E1044 occurs within the Middle Archaic period. One tooth fragment, identified as peccary, was present in the Late Archaic zone. While the amount of bone recovered from the Archaic levels was less than the amount recovered from the Late Prehistoric zone, all classes of vertebrates (amphibians, birds, fishes, mammals, and reptiles) were represented in both Late Prehistoric and Archaic levels (Appendix V).

The Late Prehistoric diagnostic materials are **Perdiz** arrow points and small end scrapers made on flakes. One distally beveled biface (Fig. 22, Group 7, Form 1, Specimen 1) was also recovered. Other chipped stone items recovered are thin bifaces, cores, and chipping debris. A few pottery sherds were recovered, including portions of a small, well-formed olla decorated with fugitive red filming. Bone beads and shell pendants suggest self-adornment practices as well as extra-regional trade contacts. Food items include an extensive array of vertebrate faunal remains and great quantities of mussel shells and **Rabdotus** land snails. Bird, lizard, snake, turtle, deer, unidentifiable **Canis** sp., rabbit, muskrat, and squirrel were recovered from Late Prehistoric levels. Feature 6 represents the only hearth exposed in the upper levels during Phase II excavations. The burned clay depression presumably functioned as an ovenlike area to process freshwater mussels and **Rabdotus** snails. This feature represents the only hearth located in the Late Prehistoric zone and differs greatly from the more complex hearths present in the Archaic levels. A radiocarbon date of A.D. 1470-1500 (MASCA corrected) was derived from Level 3.

Late Prehistoric materials were more abundant in Area B than in Area A and increased in frequency towards the slough. Water-screening operations set up along the banks of the slough resulted in the exposure of concentrations of chipped stone items, ceramics, and bone artifacts attributable to the Late Prehistoric period. The potential of this locality warranted additional excavations which were carried out by a UTSA Field School in 1981 (see Part II of this report).

PART II: THE UTSA FIELD SCHOOL EXCAVATIONS

RESEARCH GOALS

The 1981 UTSA Field School excavations were designed to further investigate the Late Prehistoric component at 41 LK 201. During Phase II excavations, water screening operations set up alongside the slough had washed out ceramics, chipped stone artifacts, bone artifacts, and animal bone fragments, suggesting that the area most intensively occupied during the Late Prehistoric period was along the banks of the slough. During the UTSA Field School investigations, excavations were concentrated in this area (Fig. 2). Excavations were restricted to the upper 20 to 30 cm of deposit in order to carefully expose and map **in situ** Late Prehistoric items. Intrasite activity areas could be, it was hoped, determined by the horizontal exposure of artifacts. Water screening techniques were implemented to insure maximum recovery of cultural and ecological materials.

Recovered from the upper 20 to 30 cm were numerous arrow points (primarily **Perdiz** points), chipped stone tools, ground stone items, bone and shell artifacts, a wide array of faunal materials, and the largest collection of ceramic sherds from a single site in the Choke Canyon region. These materials provide a cultural inventory of the latter phase of the Late Prehistoric period. A radiocarbon date of A.D. 1510-1590 (MASCA corrected) was obtained for these excavations and conforms closely to the date of A.D. 1470-1500 (MASCA corrected) derived from the Late Prehistoric zone excavated during Phase II (Appendix IV, Table 32).

THE EXCAVATIONS

A 6-m^2 excavation block area was laid out near the slough using the original (1978) datum (Fig. 25,a). The block area was divided into 2-m^2 units designated A-I. Each 2-m^2 unit was then subdivided into four 1-m^2 quadrants, with each quadrant being excavated separately. These quadrants had north coordinates of N504 to N509, while east coordinates were E1008 to E1013 (Fig. 26). Two additional units, J and K, were later opened up, although only two 1-m^2 in each were excavated (Fig. 26). These coordinates were N504 E1014, N505 E1014, N508 E1007, and N509 E1007. The units were excavated in 10-cm levels. A water pump was installed along the slough to facilitate screening operations (Fig. 25,b). The southwestern quadrant of each 2-m^2 unit was water screened through 1/4-inch and window screen mesh. The remaining quadrants were water screened through 1/4-inch mesh. Projectile points, pottery sherds, tools, and other significant items were mapped **in situ** and then assigned specific provenience numbers (Fig. 25,c). A field

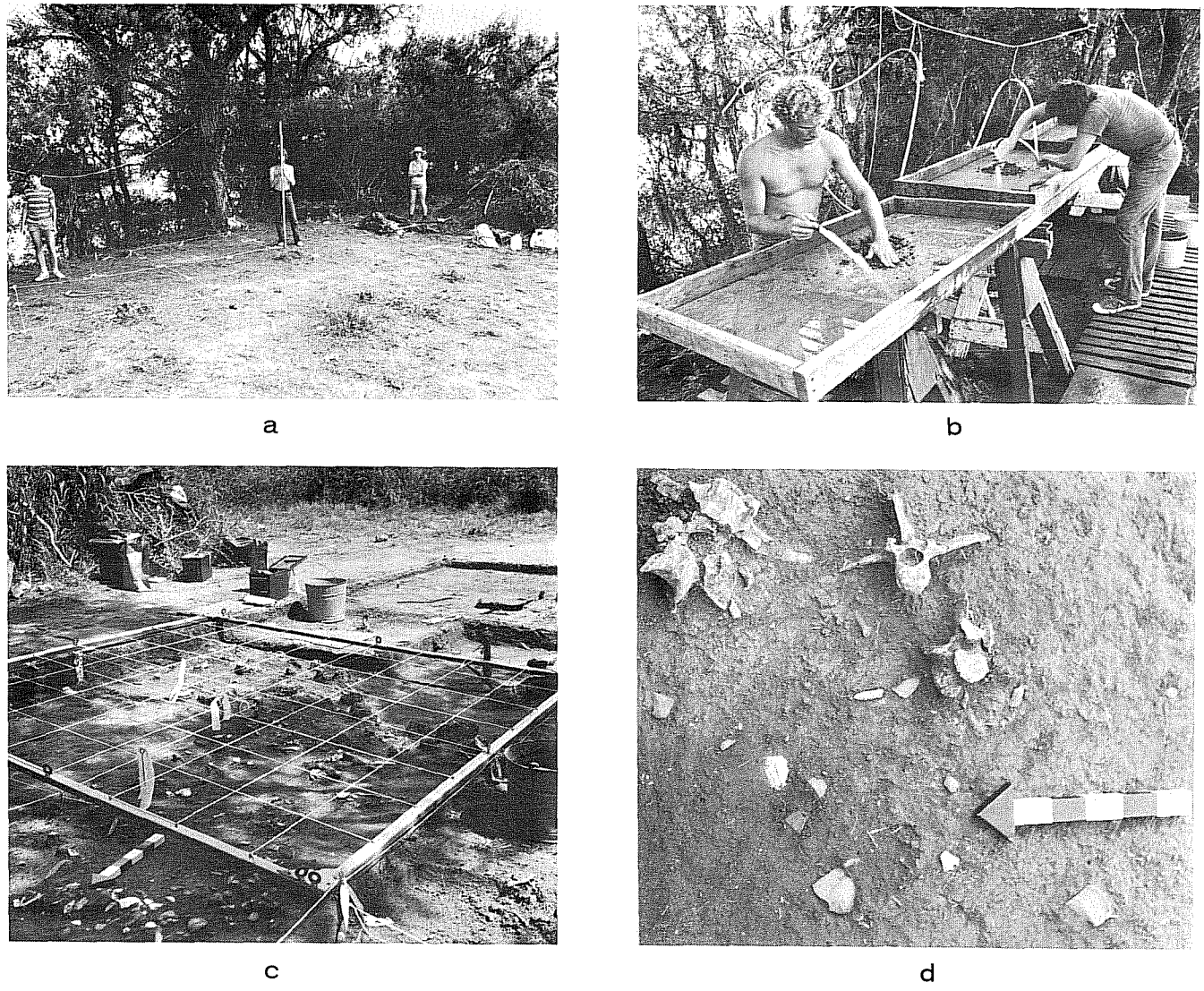


Figure 25. **UTSA Field School Excavations: Site Views and Feature Excavations.** a, view of site, prior to excavations, looking north. Slough is in background; site is in foreground; b, water screening operations set up alongside slough; c, excavations in progress; 2-m^2 grid for mapping; d, Feature 11, a concentration of articulated bison vertebra and rib fragments located in Unit N507 E1012.

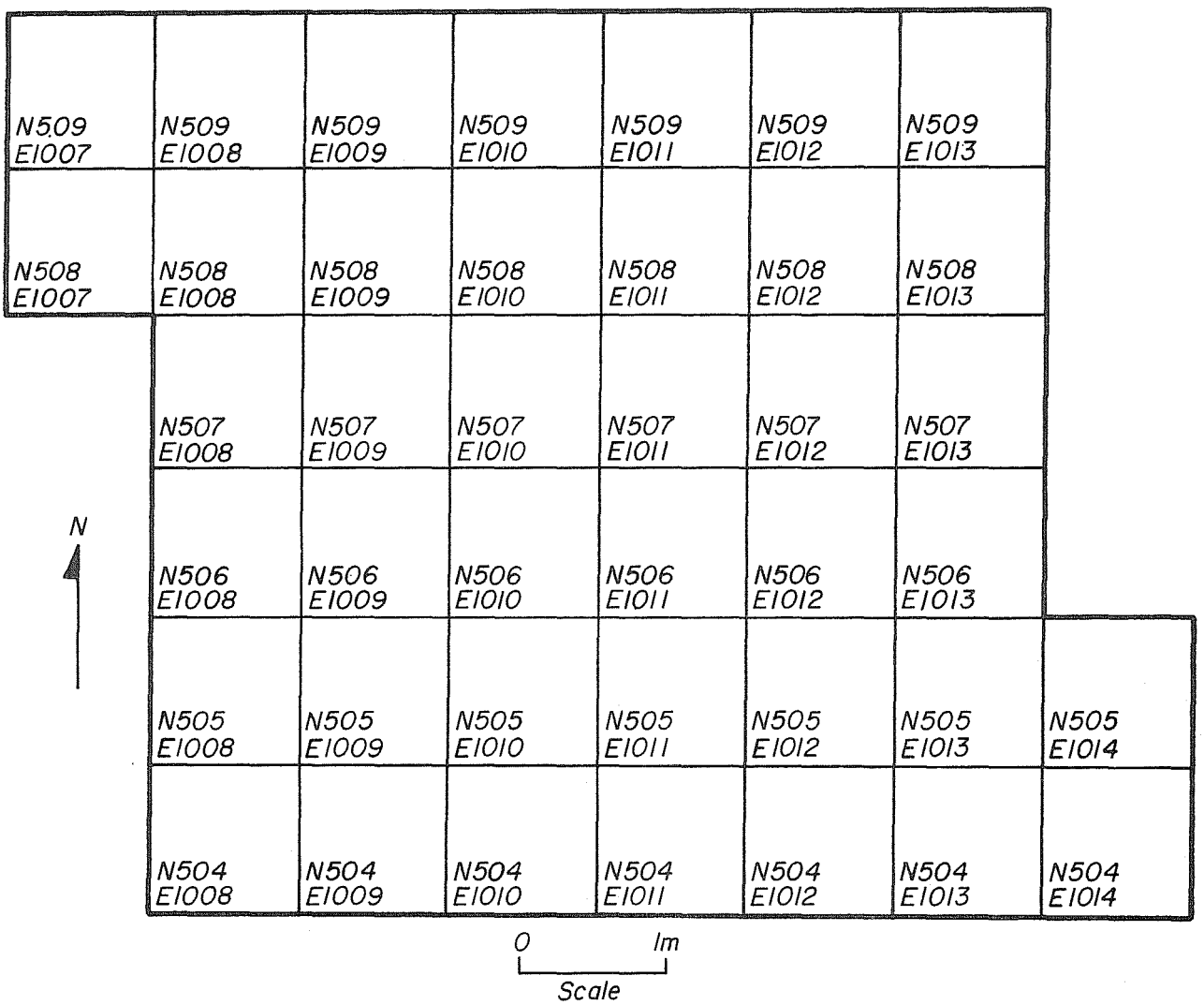


Figure 26. **UTSA Field School Excavations: Unit Designations.**

laboratory was set up, and approximately 50% of the recovered materials were processed by the students. Laboratory analysis was completed by the author. Time and funding did not permit a sorting and subsequent analyses of the fine-screened materials.

The soil in the upper 20 to 30 cm was described as a grayish brown clayey loam that was easy to dig. Heavy rains fell during the six weeks of investigations and somewhat hindered the progress of the excavations. Occasional tree stumps and root intrusions were the only disturbances noted in the field records.

Two features were exposed during the UTSA Field School investigations. Feature 11, a cluster of articulated bison bone, occurred in Level 1 (99.31-99.20 m) of Unit N507 E1012 (Fig. 25,d; 27). The identified bison bone was a vertebra and several rib fragments. Other bone identified within the feature included artiodactyl (species indeterminate), cottontail rabbit, and wood rat. Other associated items included 14 flakes or flake fragments, three potsherds, and 11 mussel shells. The feature matrix was indistinguishable from the surrounding matrix.

Feature 12, a mussel shell concentration, was located in Level 2 (99.20-99.10 m) of Unit N505 E1009 (Fig. 28,a). A total of 18 mussel shells plus many fragments weighing 272 g was recovered in association with one core, two modified flakes, four other flakes, two sherds, one **Rabdotus** snail shell, bone (gar and turtle) fragments, and charcoal.

The artifacts uncovered during the UTSA Field School excavations were found to be more concentrated than those uncovered in the Late Prehistoric zone of Area B of the Phase II excavations. Levels 1 and 2 of most units produced large quantities of materials; Level 3 was excavated in only a few quadrants and amounts of debris decreased considerably. The forty 1-m^2 quadrants produced the following items (see Appendix VII, Part II): 1828 g of tuff, 1853 g of sandstone, 3650 g of fire-fractured chert, 3154 g of mussel shell, 1112 **Rabdotus** snail shells, 5709 g of bone, 1576 sherds, 42 cores, five thick bifaces, 25 identifiable arrow points, 35 arrow point fragments, 12 beveled knives, 40 other bifaces and biface fragments, nine mano and metate fragments, three grooved stone items, and shell and bone artifacts. Historic items associated with an early ranching structure near the site, were also recovered. The fragments of tuff, sandstone, and fire-fractured chert within the excavation block, were not found in clusters that might be indicative of hearth structures. Charcoal and ash were noted throughout many of the units, with enough charcoal present to submit a sample for radiocarbon dating. The other items recovered will be discussed in the following sections.

LITHIC ARTIFACTS

Lithic artifacts recovered during the UTSA Field School excavations were grouped into the following categories: cores, thick bifaces, thin bifaces, modified and trimmed flakes, debitage, ground stone, and miscellaneous materials. The first five categories are chipped stone artifacts which have been subdivided into descriptive groups and forms as devised by Hall (Hall, Black, and Graves 1982:249-387). The specimens are primarily made of chert,

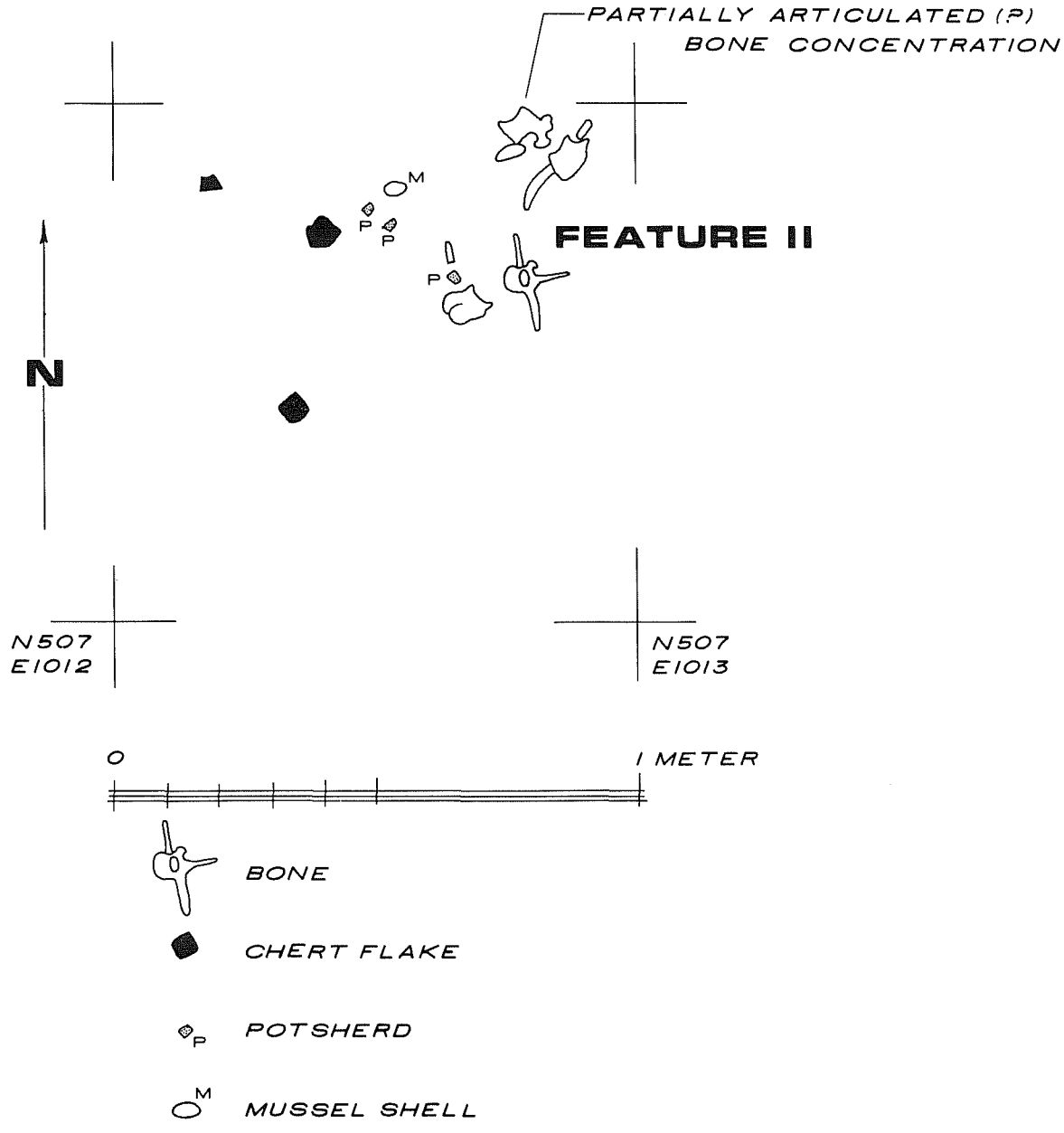


Figure 27. **UTSA Field School Excavations: Feature 11, A Concentration of Articulated Bison Vertebra and Rib Fragments.**

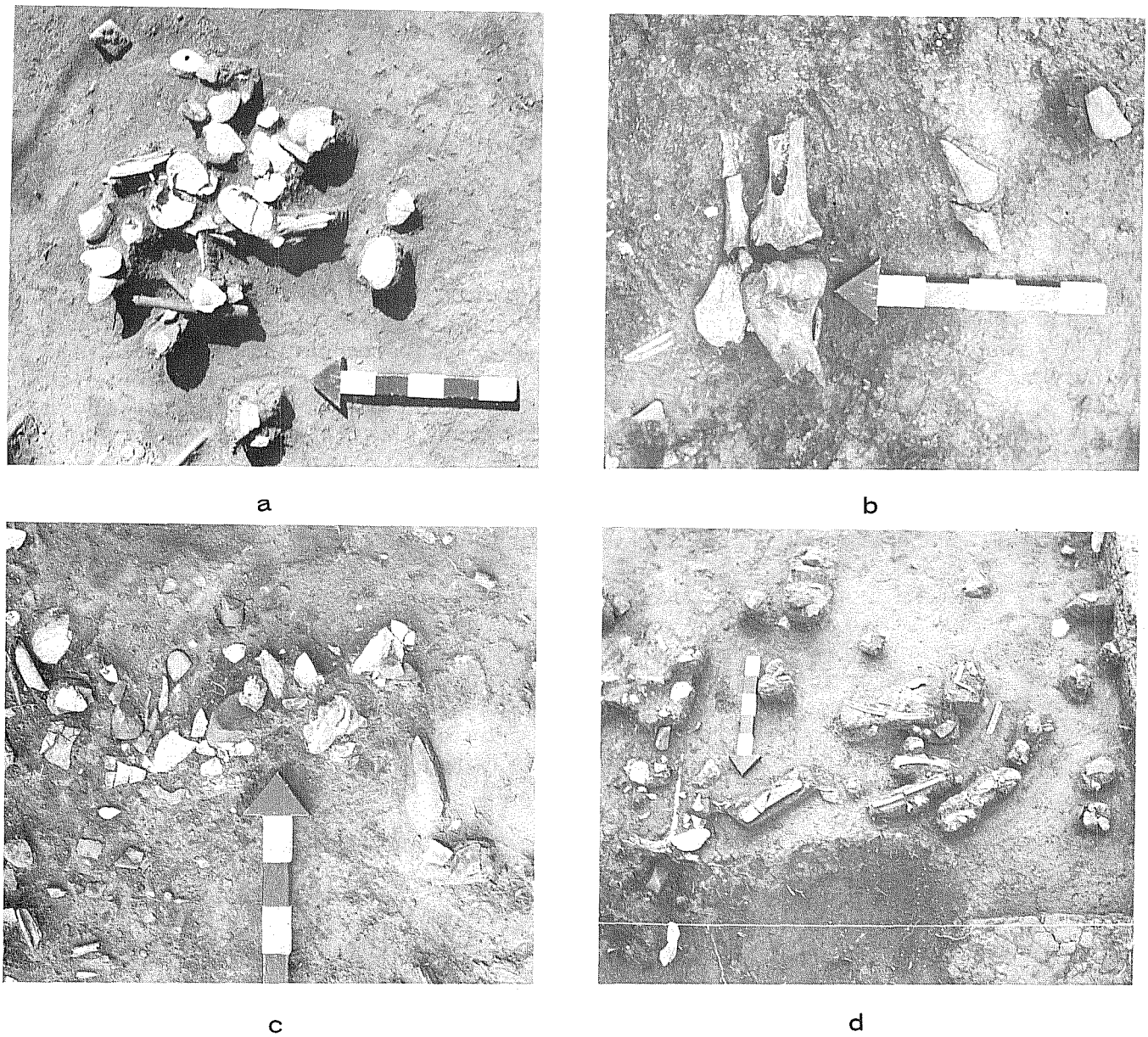


Figure 28. **UTSA Field School Excavations: Prehistoric Materials In Situ.** a, Feature 12, a mussel shell concentration located in the southwestern portion of the excavation block; b, beveled knife associated with bison radius, humerus, and ulna fragments; a tibial fragment in the adjacent unit, N508 E1008, exhibited cut marks; c, view of concentrated nature of Late Prehistoric artifacts--beveled knife, animal bone, flakes, core, sherds, mussel shell, and **Rabdotus** snail shells; d, fragmentary spatulate bone tool in northwestern corner of excavation block, associated with Late Prehistoric midden debris.

although a few items were fashioned from petrified wood and quartzite. The few pieces of ground stone are modified sandstone. These also have been grouped into several descriptive categories.

Provenience and metric data for these artifacts are presented in Appendix III. Dimensions are in centimeters, and weights are in grams.

CHIPPED STONE ARTIFACTS

Cores (42 specimens)

A total of 10 groups was devised to categorize the cores found within the Choke Canyon region (Hall, Black, and Graves 1982:250). Specimens representing Groups 1, 2, 3, 5, 6, and 9 were recovered during the UTSA Field School excavations. These groupings are based on the direction(s) from which flakes were struck, striking platform preparation, striking platform morphology, size, shape, and degree of reduction (**ibid.**). Provenience, dimensions, and weights are provided in Appendix III, Table 23.

Group 1. Natural Platform (eight specimens)

Group 1 cores are cobbles that have had flakes removed using natural platforms. The irregularly shaped specimens consist of five chert, two siliceous quartzite, and two petrified wood cobbles. Two specimens have had flakes removed unidirectionally, but the others have been struck multidirectionally. Three specimens retain 30-90% of the cortex, while the others appear to be split cobbles and retain approximately 50% of the cortex. An example of Group 1 cores is illustrated in Figure 29,a.

Group 2. Bidirectional, Natural, and Prepared Platforms (two specimens)

Group 2 cores consist of two specimens, one of chert and one of petrified wood, that have been struck bidirectionally at one end. The first flakes were removed using natural cortex platforms. The resulting flake scars were then used as platforms for flake removals from the opposite direction. These specimens retain 60-80% of the cortex. An example of Group 2 cores is shown in Figure 29,b.

Group 3. Multidirectional, Natural and Prepared Platforms, Single, and Multiple Facets (two specimens)

Group 3 core specimens have both natural and prepared platforms with single and multiple facets from which flakes have been removed multidirectionally. One specimen is a large flake from which other flakes have been removed; it retains one large patch of cortex. The other specimen appears to be a small reduced cobble with only a small patch of cortex remaining on one face. An example of Group 3 cores is shown in Figure 29,c.

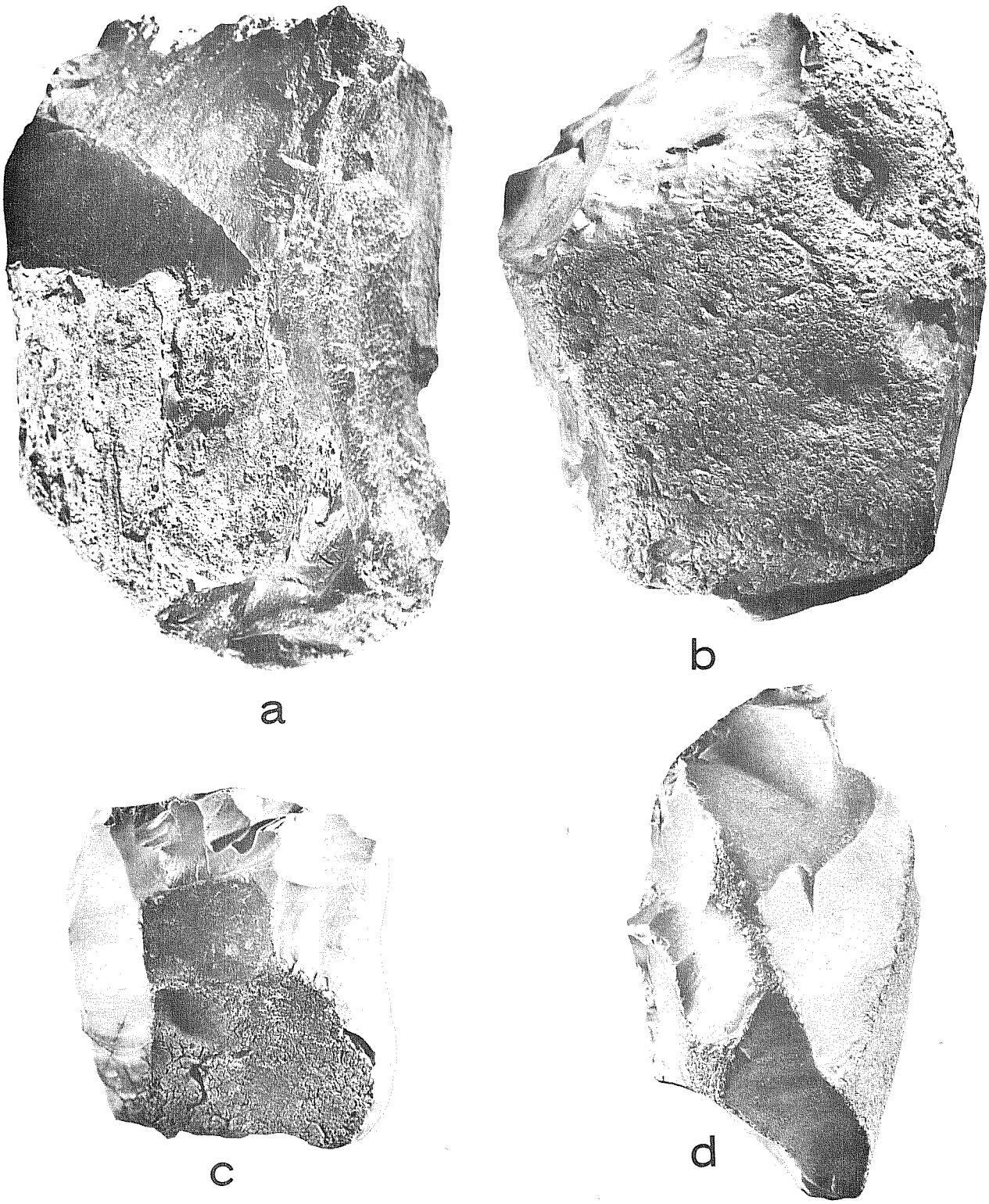


Figure 29. **UTSA Field School Excavations: Cores.** a, Group 1; b, Group 2; c, Group 3; d, Group 5.

Group 5. Multidirectional, Natural, and Prepared Platforms, Single Facets (six specimens)

Flakes have been removed multidirectionally from these Group 5 core specimens using single facet prepared and natural platforms. Most specimens retain up to 50% of the cortex, while one specimen has no cortex. Five of the specimens are reduced cobbles, and a single specimen is a large flake from which other flakes have been removed. An example of Group 5 cores is shown in Figure 29,d.

Group 6. Core Nuclei (five specimens)

Group 6 core specimens are core nuclei or exhausted cores. These specimens were probably discarded because additional flake removal or reduction would have been impractical or impossible. All are small specimens and generally irregular and angular. Flakes were removed multidirectionally using cortex and prepared platforms with single and multiple facets. All specimens have small areas of remaining cortex.

Group 9. Core Fragments (19 specimens)

Group 9 cores are unclassifiable fragments of shattered cores and trimmings from platform preparation. Because of the fragmentary nature of these specimens, measurements and weights are not provided. Provenience is provided in Appendix III, Table 23.

Thick Bifaces (five specimens)

Thick biface specimens measure 1.3 cm or more in thickness, have 10 to 30 flake scars which are each at least 1 cm^2, and probably represent manufacturing failures (Hall, Black, and Graves 1982:266). Only five fragmentary specimens were recovered during the UTSA Field School excavations. Metric data and provenience are provided in Appendix III, Table 24.

Group 7. Fragments with Rounded Ends (two specimens)

One specimen in Group 7 thick bifaces has two small areas of cortex remaining on one side. The other specimen retains no cortex and has been fire fractured.

Group 8. Odd and Miscellaneous Forms (three specimens)

Two fragments in Group 8 thick bifaces are irregularly shaped and retain very little cortex. The third specimen has no cortex and appears to have been ovate in shape prior to breakage.

Thin Bifaces (112 specimens)

Thin bifaces measure less than 1.3 cm in thickness, have straight, smooth edges, and were shaped into their present form by pressure flaking (Hall, Black, and Graves 1982:278). In most cases, all cortex has been removed. The bifaces are placed into groups and forms, with each category sharing similar characteristics, primarily size and shape (**ibid.**). Provenience and metric data are presented in Appendix III, Tables 25 and 26.

Group 1. Stemmed (61 specimens)

Form 4. Small with Contracting Stems (22 specimens)

In the Group 1, Form 4 thin biface category a total of 19 specimens can be identified as **Perdiz** points. The majority of the points have contracting, pointed stems, while five specimens have somewhat bulbous stems that taper to a point (Fig. 30). The points range from a few well-made specimens to several unfinished specimens. The blades on the more complete points curve inward from the sharp, prominent barbs. Two of the specimens have very sharp, needlelike distal tips. The broken specimens have transverse blade breaks. Nine of the specimens have unifacial blades and bifacial stems, while the other 10 have both bifacial stems and blades. The majority of these points are very small (Appendix III, Table 25). The specimens were recovered primarily from Levels 1 and 2.

Three specimens are similar in configuration to so-called **Cliffton** points (Group 1, Form 4, Specimens 68 and 69, Fig. 30). However, these points are unfinished and as with other similar specimens in south Texas, they are believed to be **Perdiz** preforms (Hester 1980:106). One specimen has a unifacial blade with very minimal flaking or shaping. Although the stem has been bifacially shaped, it is short and wide at the neck. The second specimen is similar, although the blade has had extensive bifacial shaping. The bifacial stem is also short and wide at the neck. Both specimens are absent the distal tip. The third specimen (Specimen 70) is unifacially worked.

Form 5. Small with Expanding Stems (four specimens)

Group 1, Form 5 specimens represent the only expanding stem arrow points recovered from 41 LK 201 during three separate seasons of excavations. The four relatively complete points will be described separately below. The specimens are generally atypical of arrow points assigned to **Edwards** and **Scallorn** categories. Similar expanding stem points co-occur with **Perdiz** arrow points at other late phase Late Prehistoric sites in south Texas (Black n.d.).

Specimen 3: Group 1, Form 5, Specimen 3 is a small bifacial point with narrow corner notches which have produced expanding stem edges (Fig. 30). The basal edge is straight. The blade has sharp barbs, concave lateral edges, and the distal tip is missing. The specimen is particularly similar to Specimen 4.

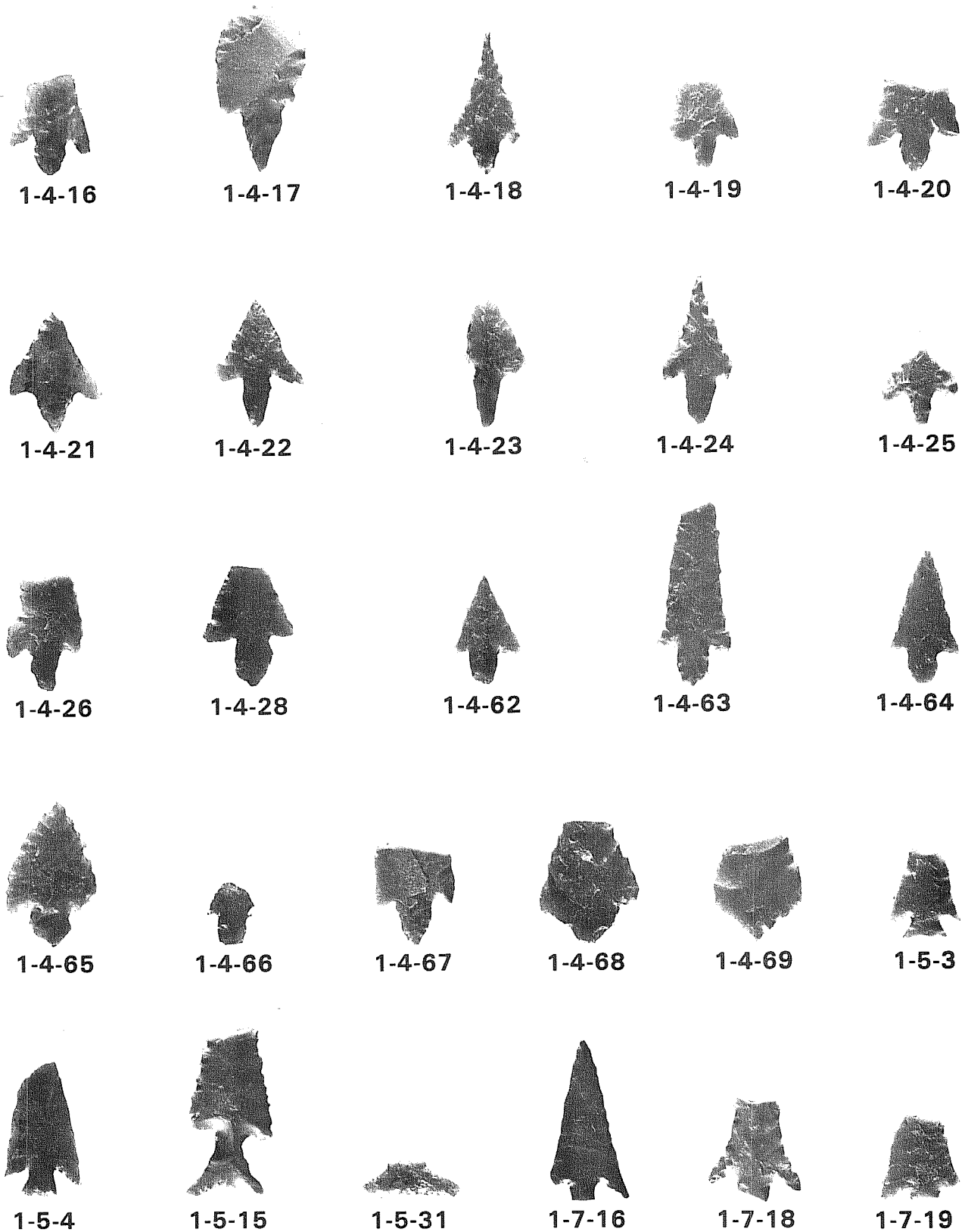


Figure 30. **UTSA Field School Excavations: Stemmed Thin Bifaces, Group 1, Form 4 (Arrow Points).** Numbers beneath each specimen indicate group, form, and specimen number, respectively.

Specimen 4: Group 1, Form 5, Specimen 4 has deep corner notches cut in from the corners. The basal edge is straight (Fig. 30). The long blade has sharp prominent barbs and convex basal edges. Although similar to Specimen 3, which is bifacial, this specimen has a unifacial blade and bifacial stem. Specimens 3 and 4 have corner notching similar to **Edwards** points, but do not have the characteristic concave basal edge.

Specimen 15: Group 1, Form 5, Specimen 15 is bifacial and has a stem similar to **Edwards** points except that the neck is elongated. Deep, wide corner notches have produced the long stem neck (Fig. 30). The stem is as wide as the blade and has a broadly concave base. The blade has serrated lateral edges and is missing the distal tip.

Specimen 31: Group 1, Form 5, Specimen 31 is an expanding stem basal fragment (Fig. 30) similar to **Edwards** points.

Form 6. Unclassifiable Fragments of Large Stemmed Bifaces (one specimen)

Specimen 2: Group 1, Form 6, Specimen 2 is an unusual specimen that appears to have been a dart point with a parallel-edged or slightly expanding stem. The distal tip is missing as is one of the barbs. The barb or lower corner of the blade was apparently broken off, and a notch (0.8 cm in length) was placed into the lower portion of the blade directly above the stem (Fig. 31). This was the only dart pointlike specimen found during the UTSA Field School excavations. It was collected from Level 1 of Unit N505 E1011. This specimen is similar to **Charcos** dart points identified from northeastern Mexico (Heartfield 1975:136-137). **Charcos** points generally exhibit blade notching. The asymmetrical triangular blades characteristically have one barbed shoulder. The opposite edge is shoulderless and exhibits one or more notches. The 41 LK 201 specimen falls within the range of dimensions provided by Heartfield (1975:137).

Form 7. Unclassifiable Fragments of Small Thinned Bifaces (34 specimens)

Group 1, Form 7 specimens are either distal, medial, or basal portions of small arrow points. Five specimens have an intact blade and neck, but the lower diagnostic portion has been snapped off. The single basal fragment has a slightly expanding stem with a convex basal edge (Fig. 30, Group 1, Form 7). A total of 28 other specimens consist of distal tips and medial blade fragments. Of these, 22 are bifacial, and six are unifacial. One specimen was fashioned from brown quartzite.

Group 2. Unstemmed with Straight Base (one specimen)

Form 2. Proximal Fragment (one specimen; Fig. 31)

Specimen 9: Group 2, Form 2, Specimen 9 is a long, narrow fragment missing its distal tip. The basal edge is straight. One lateral edge is fairly straight, though sinuous, while the other is convex. The specimen appears to

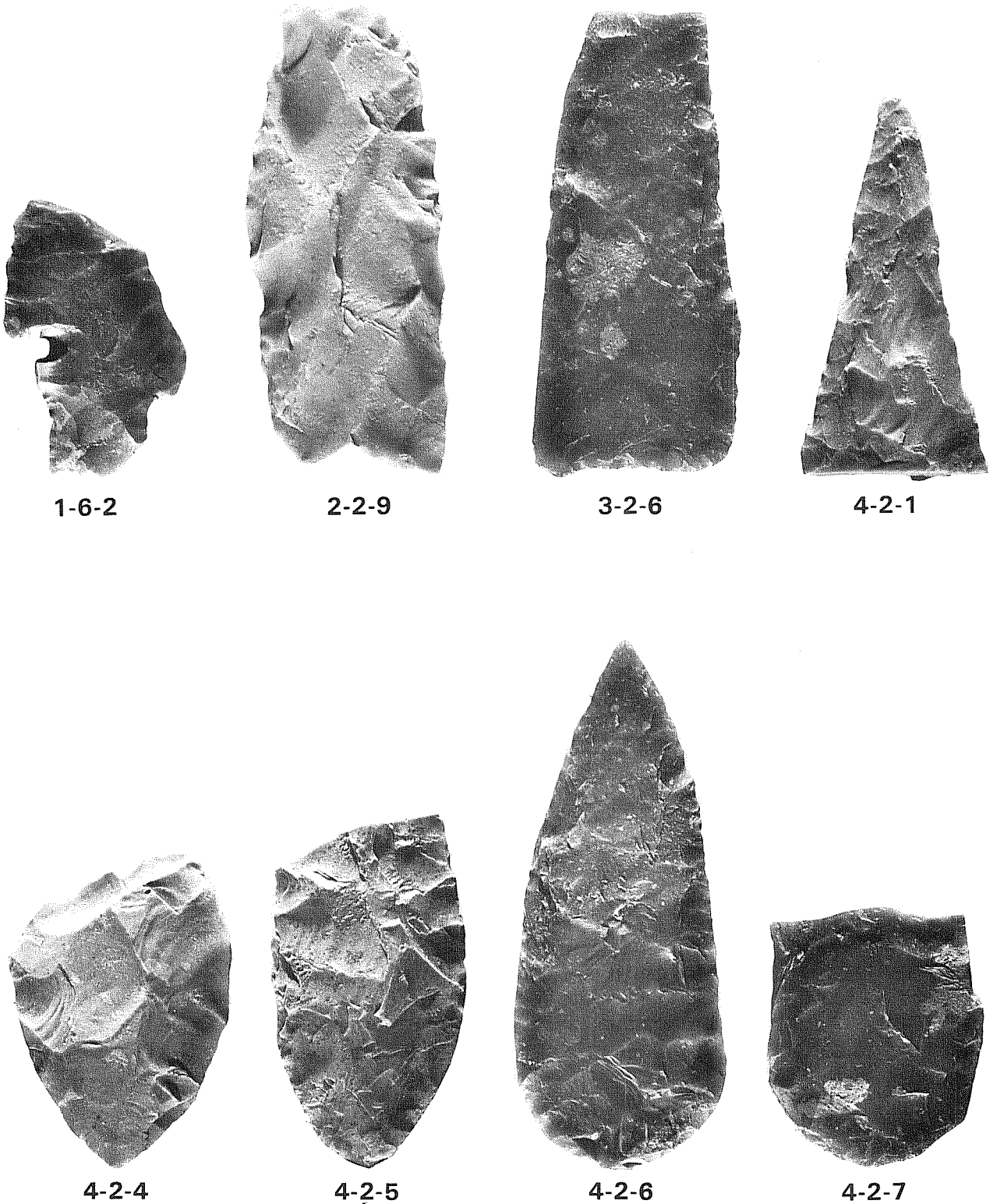


Figure 31. **UTSA Field School Excavations: One Stemmed Thin Biface (Group 1, Form 6) and Unstemmed Thin Bifaces (Beveled Knives).** Numbers beneath each specimen indicate group, form, and specimen numbers, respectively.

represent a discarded preform as one large "knot" is present on one face and apparently could not be removed during the thinning process.

Group 3. Unstemmed with Concave Base (one specimen)

Form 2. Proximal Fragment (one specimen; Fig. 31)

Specimen 6: Specimen 6 from Group 3, Form 2 thin bifaces is triangular with a concave basal edge, straight lateral edges, and is missing the distal tip.

Group 4. Unstemmed with Convex to Semicircular Bases (25 specimens)

Form 2. Steeply Beveled Blades (12 specimens)

Group 4, Form 4 specimens are a very distinctive tool form often referred to as beveled knives. They are somewhat ovate in outline with a generally rounded or convex-edged proximal end, while the longer distal end has convex to acutely concave lateral edges. The lateral edges are characteristically alternately beveled. Each specimen will be described individually following a discussion of the tool form.

Brown (Brown **et al.** 1982:55-63) recently reviewed the available information on beveled knives. Four-bevel bifaces, often termed "Plains" or "Harahey" bifaces, appear at many sites at ca. A.D. 1300 in the southern Great Plains. Several sites in central and northern Texas contain both 4-bevel and 2-bevel knives, while only the 2-bevel form appears to occur in south-central and southern Texas (**ibid.**). The 2-bevel form present at a number of Choke Canyon sites and throughout south Texas is typically quadrilateral in outline. The basal portion is rarely beveled and is usually semicircular, although contracting stem edges do occur. The blade edges are beveled, usually on the left side. Specimens average 8 cm in length.

Brown (Brown **et al.** 1982:55-56) suggests that this tool form originated as a large, thinned, ovate biface (protoform) with a slight distal bevel. As resharpening to facilitate cutting became necessary, the bevel became more obvious, and the once convex lateral edges became concave. The protoforms and the resharpened specimens exhibit similar microscopic wear patterns. Breakage usually results in a transverse snap forward of the lateral corners (**ibid.**).

Specimens from south Texas generally co-occur with **Perdiz** points and pottery (Hester and Hill 1975; Hester 1980:110). Bison bone is often present in these Late Prehistoric assemblages, and it has been suggested that beveled knives were used in bison-butchering activities. However, poor preservation at many sites in south Texas prevents supportive evidence for the association of this tool form with butchering activities (Brown **et al.** 1982:59). Microwear studies by Brown (**ibid.**:59-61) indicates that these tools were used as cutting implements and, possibly, as scrapers.

The beveled knives from 41 LK 201 appear to fall within two separate activity areas. As discussed in the summary of the UTSA Field School investigations,

these two clusters of materials appear to represent two separate activity areas with a range of tasks (food processing, hide working, flintknapping, etc.) being performed within each area. One cluster is present in the northeast corner of the excavation block and includes nine beveled knives. In the 10 or so 1-m^2 units in this corner of the excavation block were many identifiable bone elements. White-tailed deer is the predominant artiodactyl present in this area. Bison was identified in only two quadrants, while pronghorn occurred in one quadrant. Because of their association with white-tailed deer, bison, and pronghorn remains, it appears that beveled knives were used in the butchering process of all three artiodactyl species. This assumption is corroborated by recent analyses of the Late Prehistoric assemblage at 41 JW 8 (Black n.d.). Hide-processing activities in the northeastern sector are also suggested by two beveled knives which apparently functioned as scrapers. One knife (Specimen 9) was reworked along the distal end to form a scraperlike edge (Fig. 32). In addition, a proximal fragment (Specimen 7) shows wear along the broken edge and may also have functioned as a scraper.

The other group of beveled knives, consisting of one complete knife, one proximal fragment, and two fragments that fit together to form one complete specimen, were recovered from the western half of the excavation block. Bison bone occurs more frequently in this area than in the northeastern region. White-tailed deer is also present in many of the units. Direct evidence of the use of beveled knives in butchering activities is provided in the extreme northwestern portion of the excavation block. Bison bone was identified in three adjacent quadrants, N508 E1007, N508 E1008, and N509 E1007. A beveled knife was located in Unit N508 E1007 (Fig. 28,b). The bison bone in Unit N508 E1008 exhibited cut marks (Appendix V:230).

The beveled knives from 41 LK 201 consist of six complete specimens and six fragments. Of the fragmentary specimens, one is a distal portion, while the others are proximal fragments. Although beveling is absent on several of the fragments, the configuration of the fragments is similar to that of typical beveled knives. These specimens may have been broken during manufacture or may have been protoforms that had not yet been resharpened. Two of the specimens (Specimens 7 and 9) may have functioned as scrapers.

The following is a description of each beveled knife. Provenience and metric data are provided in Appendix III, Table 26.

Specimen 1: Group 4, Form 2, Specimen 1 is a distal fragment that exhibits the characteristic alternate beveling of the left lateral edges (Fig. 31).

Specimen 4: Group 4, Form 2, Specimen 4, apparently a basal fragment, has pronounced convex lateral edges that contract to a point. Although beveling is not present on this fragment, the specimen is very similar to complete beveled knives (Fig. 31).

Specimen 5: Group 4, Form 2, Specimen 5 is similar to Group 4, Form 2, Specimen 4 described above. It has convex lateral edges that contract to a point (Fig. 31). Evidence of beveling is lacking. The lower portion of the specimen has dulled edges.

Specimen 6: Group 4, Form 2, Specimen 6 is a complete beveled knife that still retains its ovate or protoform shape with only minimal beveling along the left edge (Fig. 31). The basal edge is convex, almost semicircular. The bevel begins 2.7 cm from the basal edge on one face and begins 1.9 cm from the basal edge on the opposite face.

Specimen 7: Group 4, Form 2, Specimen 7, a proximal fragment, has a convex basal edge, portions of which have been dulled (Fig. 31). Beveling is present on the left side and begins 2.7 cm from the basal edge. The broken edge is heavily worn or ground with tiny flake scars occurring across the edge, suggesting that the broken edge was utilized, perhaps as a scraper. Portions of the basal edge and remaining lateral edges are also dulled.

Specimen 8: Group 4, Form 2, Specimen 8 was reconstructed from two fragments (Fig. 32). The proximal fragment was found in Level 1 of Unit N504 E1009, and the distal portion was found in Level 1 of Unit N505 E1009. The proximal end is convex, and the beveling begins 1.8 to 2.2 cm from the basal edge. The bevel occurs on alternate left lateral edges. Although the blade tapers in from the basal edge, the edges remain relatively straight.

Specimen 9: Group 4, Form 2, Specimen 9, a unique specimen, is a reworked beveled knife (Fig. 32). The convex-edged proximal portion retains one patch of cortex. The broad bevel along the left lateral edges begins 2.4 cm from the basal edge. The tip has been rounded by reshaping. Although larger, the resulting working end is typical of the small end scrapers often found at prehistoric sites. The ventral edge is flat, while the dorsal face recedes back from the edge and becomes thicker and convex. This edge is well worn and dulled.

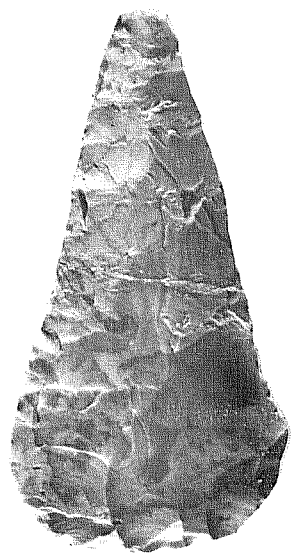
Specimen 10: Group 4, Form 2, Specimen 10, a proximal fragment, has a convex basal edge (Fig. 32).

Specimen 11: Group 4, Form 2, Specimen 11 is a complete specimen made of petrified wood. The basal edge has contracting lateral edges (Fig. 32). The broad bevel along the left edge begins 1.8 to 2.2 cm from the basal edge. One lateral edge is straight, while the other is irregular.

Specimen 12: Specimen 12 from Group 4, Form 2 differs from the other beveled knives in that it is more narrow, and it has two small side notches that occur above the proximal end and below the beveled blade (Figs. 28,c; 32). The proximal end is convex in outline. The bevel begins above the side notches approximately 2.5 cm from the basal edge. This specimen is also alternately beveled along the left lateral edges. One edge is slightly convex, while the other is straight before angling off towards the distal tip.

Specimen 13: Group 4, Form 2, Specimen 13, a small fragment, has contracting lateral edges and appears to be a proximal portion of a beveled knife.

Specimen 14: Group 4, Form 2, Specimen 14 is a complete biface with a convex basal edge (Fig. 32). The lateral edges are slightly concave with the bevel occurring along alternate left edges. The beveled edges begin 1.7 to 2 cm above the basal edges.



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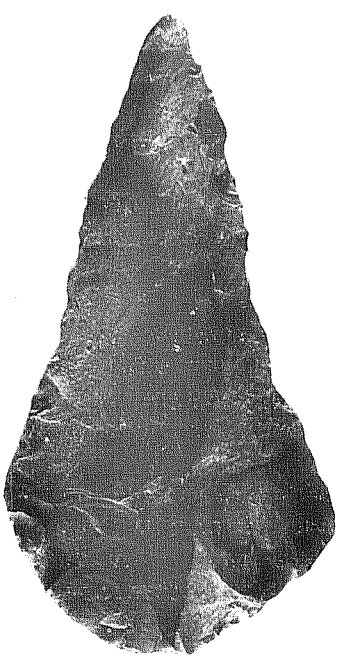

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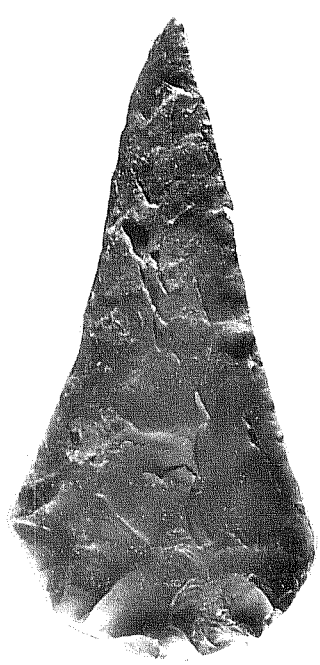

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Figure 32. **UTSA Field School Excavations: Unstemmed Thin Bifaces, Group 4, Form 2 (Beveled Knives).** Numbers beneath each specimen indicate group, form, and specimen number, respectively.

Form 3. Oval to Elliptical (five specimens)

Group 4, Form 3 specimens are generally complete and oval to elliptical in outline.

Specimen 13: Group 4, Form 3, Specimen 13 is a small ovate biface (Fig. 33).

Specimen 14: Group 4, Form 3, Specimen 14 is a small ovate biface and is thickest along the distal end (Fig. 33). The proximal end is somewhat convex, and the lateral edges are also convex.

Specimen 15: Group 4, Form 3, Specimen 15 has relatively straight lateral edges that converge to a point at the distal end (Fig. 33). The other end is straight with numerous flake scars along this edge.

Specimen 16: Group 4, Form 3, Specimen 16 is made of petrified wood and has contracting basal edges and slightly convex lateral edges (Fig. 33). The distal tip is missing. This specimen is primarily unifacial with minimal flaking on the ventral edge.

Specimen 17: Group 4, Form 3, Specimen 17 is very similar to Group 4, Form 3, Specimen 16. The basal edges contract, and the lateral edges are convex (Fig. 33). The specimen is primarily unifacial with minimal flaking on the ventral face.

Form 4. Fragments with Convex to Semicircular Ends (eight specimens)

Group 4, Form 4 specimens are fragments with rounded or convex ends. Six of these fragments are large and poorly flaked and may have been broken during the manufacturing process. The other two specimens are small and thin and appear to be arrow point preforms. Five specimens are illustrated in Figure 33.

Group 7. Diamond Shaped (one specimen)

One small complete biface is categorized as a Group 7 thin biface; it is widest at the midsection and tapers to a point at either end (Fig. 33). A slightly beveled effect is present along the upper left and lower right edges on each face.

Group 8. Bifaces with Sharp, Slender Projections (four specimens)

Thin bifaces from Group 8 are drills or perforators and have long, narrow needlelike projections (Fig. 33). The drill tips measure from 2.1 to 3.1 cm in length. They are made on large flakes. One specimen has been unifacially worked. The other three specimens have well-made, narrow bifacial distal ends with a biconvex cross section. The proximal ends of two specimens have received little shaping, and one of these retains a small patch of cortex, while the other specimen has a bifacially shaped proximal end.

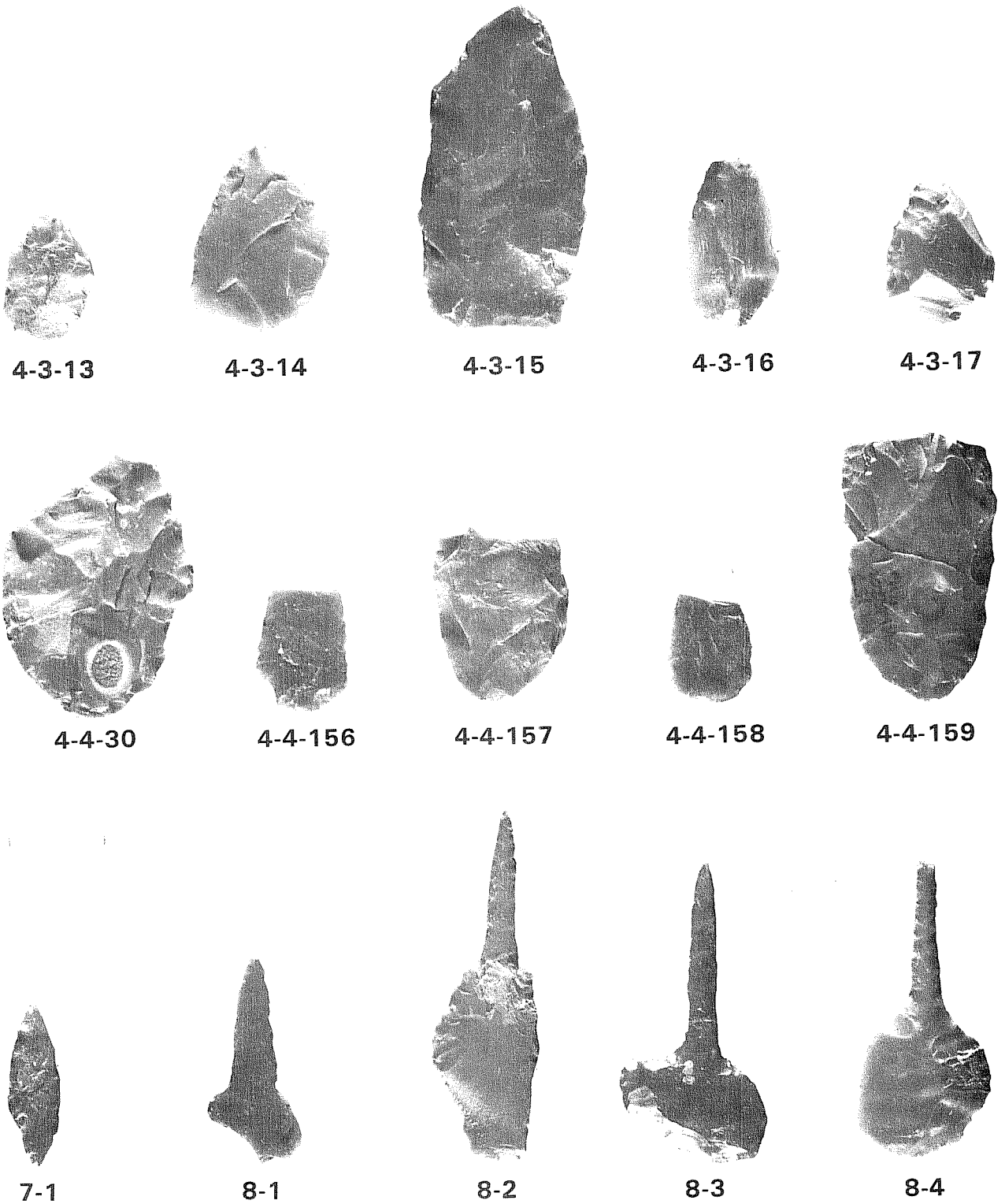

Figure 33. **UTSA Field School Excavations: Unstemmed Thin Bifaces, Groups 4, 7, and 8.** Three numbers beneath artifact indicate group, form, and specimen number; two numbers indicate group and specimen number, respectively.

The four complete specimens were found in the southeastern corner of the excavation block within a 2 to 3 m range. Similar specimens were recovered during Phase I at 41 LK 201, 41 LK 41, and 41 MC 15 (Hall, Black, and Graves 1982) and during Phase II at 41 MC 296 (Hall, Hester, and Black 1986). They are common in other south Texas Late Prehistoric assemblages (Hester 1980:109-110).

Group 9. Fragments with Pointed Ends (seven specimens)

Most of the specimens in Group 9 thin bifaces are rather crudely flaked with irregular edges and appear to be portions of preforms broken during the manufacturing process. One or two more finely flaked fragments may represent portions of finished tools.

Group 10. Lateral and Medial Fragments (12 specimens)

Thin bifaces in Group 10 are fragments that do not conform to previously defined groups. The majority are lateral fragments. Several are quite small and may represent arrow point fragments.

Modified and Trimmed Flakes

Modified and trimmed flakes were found in 34 of the forty 1-m^2 quadrants. Provenience and a brief description of the flakes are provided in Appendix III, Table 27. Modified flakes are defined as flakes exhibiting random flake scars along one or more edges which result from utilization of the flake as a tool. Trimmed flakes are those which have been intentionally shaped by the removal of uniform flakes along one or more edges. The most unique of the trimmed flakes are those referred to as end scrapers. This type of tool occurs at most south Texas Late Prehistoric sites and is generally made on a curved flake or blade with the end opposite the platform being shaped, presumably, to function as a scraper. Recent wear pattern studies by Black (n.d.) support this assumption. Fourteen such tools were recovered from the UTSA Field School excavations; 12 end scrapers are illustrated in Figure 34,a-l.

Debitage

The flakes and chips recovered from the UTSA Field School excavations were sorted into the same categories as described for Phase II in Part I of this report. Debitage totals by unit and level are presented in Appendix VII, Part II. In addition to the flakes, a total of 42 cores was recovered along with numerous **Perdiz** points, beveled knives, drills, end scrapers, and bifacial preforms, indicating that all levels of flintknapping were carried out at the site. The flake sample breaks down into debitage types in the following percentages:

Primary Flakes	1.6%	Tertiary Flakes	29.0%
Secondary Flakes	15.8%	Chips	53.6%

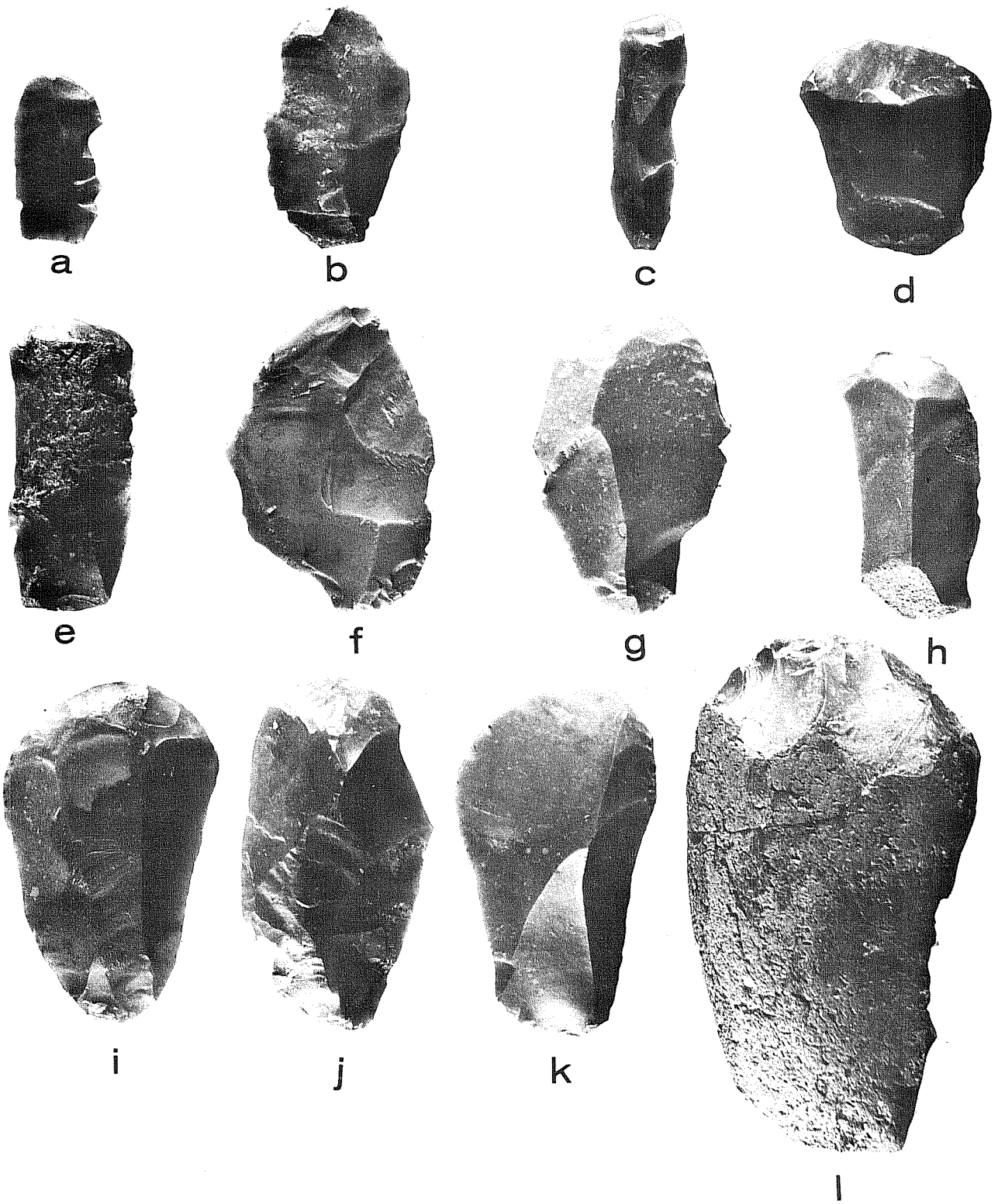

Figure 34. **UTSA Field School Excavations: Late Prehistoric End Scrapers.** a, Lot 709; b, Lot 723; c, Lot 698; d, Lot 727; e, Lot 700; f, Lot 650; g, Lot 679; h, Lot 730; i, Lot 655; j, Lot 730; k, Lot 720; l, Lot 701. See Appendix III, Table 27 for provenience and description.

GROUND STONE ARTIFACTS

Only a few pieces of modified sandstone were recovered during the UTSA Field School excavations. They are grouped and described below. Group 1 consists of grinding slab fragments (metates), Group 2 contains manos, and Group 3 consists of grooved pieces. Provenience is provided in Appendix III, Table 28.

Group 1. Smoothed Slabs and Slab Fragments with Flat and/or Concave Faces (eight specimens)

Form 2. Medium (two specimens)

Two fragmentary ground stone specimens from Group 1, Form 2 range from 10.5 to 12.5 cm in length and average 2.9 to 3.4 cm in thickness. One has a slight depression or basin. Only one face has been ground on each specimen.

Form 3. Small (six specimens)

Six small ground stone fragments from Group 1, Form 3 range in length from 3.0 to 8.1 cm and average 0.9 to 3.6 cm in thickness. Three have only one ground surface, while three have two modified surfaces. Three fire-fractured fragments (Lot Nos. 703, 714, and 729) fit together.

Group 2. Subcircular to Angular with a Flat and/or Convex Face (one specimen)

Form 3. Mano Fragment (one specimen)

Group 2, Form 3 specimen is a fragmentary mano. Both surfaces and the edges have been ground smooth.

Group 3. Grooved Pieces (three specimens)

Representative of Group 3 are three grooved sandstone specimens. One of these (Lot No. 702; Fig. 35,a) has a wide U-shaped groove which extended lengthwise across the thin piece of sandstone. Another fragment (Lot No. 700; Fig. 35,b) exhibits two randomly placed shallow grooves. The third specimen (Lot No. 718; Fig. 35,c) has four grooved notches, one on each of the four sides. These items may have been used to abrade the edges of bifaces during the flintknapping process and/or used to shape bone or wood artifacts (Hester 1980:15; Black n.d.). The specimen exhibiting four grooves (Lot No. 718) was recovered from Unit N509 E1008. Also recovered from this unit and the adjacent unit (N509 E1007) were two bone bools, described as spatulates. It is possible that the grooved abrader was used to smooth and shape the edges of these bone tools.

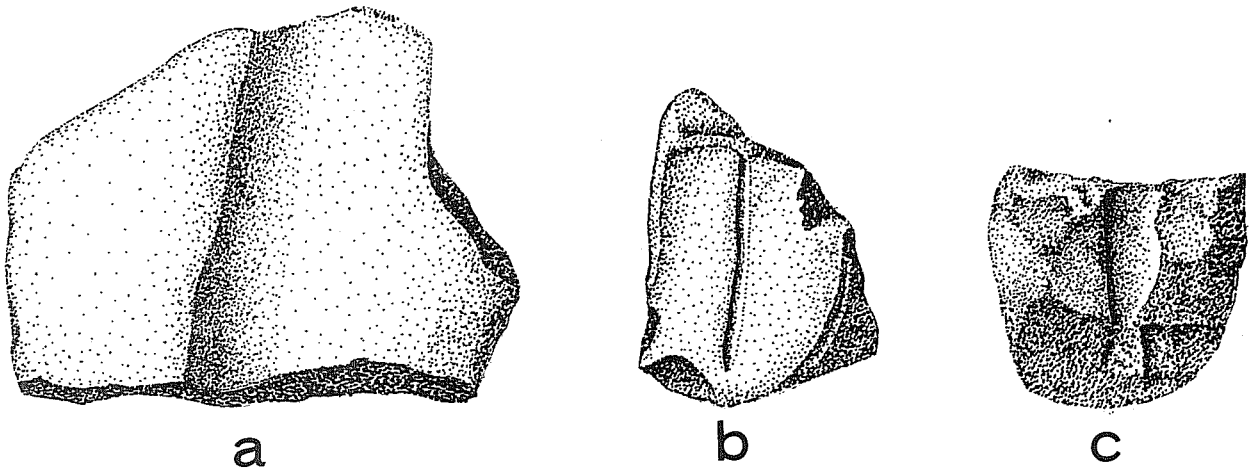

Figure 35. **UTSA Field School Excavations: Ground Stone, Group 3 (Grooved Pieces).** a, Lot 702; b, Lot 700; c, Lot 718. Artifacts are illustrated actual size.

MISCELLANEOUS MATERIALS

The following items do not fit within previously described categories.

QUARTZ PEBBLE (one specimen)

A small white quartz pebble was recovered from Level 2 of Unit N504 E1011. Although the pebble cannot be definitely linked to prehistoric activities, it is reported here because quartz does not occur naturally in the soils; thus, it appears to be a "manuport." Length is 2.8 cm, width is 2.5 cm, thickness is 1.7 cm, and weight is 18.6 g.

OCHER (six samples)

Several small (<1 g) fragments of red and yellow ocher were recovered during the UTSA Field School excavations. The red ocher may have been used to produce the red film present on many of the sherds. The six fragments were recovered from the following units:

Lot No.	Unit	Level	Elevation	Count	Color
692	N506 E1013	2	99.20-99.10 m	2	red
716	N509 E1009	2	99.10-99.00 m	1	yellow
720	N504 E1012	2	99.20-99.10 m	2	red
723	N505 E1013	2	99.20-99.10 m	1	red
732	N505 E1014	1	99.25-99.20 m	1	yellow
733	N504 E1014	2	99.20-99.10 m	2	red

IMPRESSED FIRED CLAY NODULE (one specimen)

One fired clay nodule exhibiting a distinct impression measuring 2.2 cm wide was recovered from an eroding hearth located near the UTSA Field School excavations. The nodule weighs 302 g. Similar nodules were found during Phase II excavations (see Part I of this report). It has been suggested that the impressed marks resulted from digging sticks used to pry wet clay for making pottery from the banks of sloughs or rivers. It is also possible that the marks are root impressions.

SHELL ARTIFACTS

Both modified marine and mussel shells were recovered during the UTSA Field School excavations. Similar items were recovered during Phase II and are discussed in detail in Part I of this report. Provenience is provided in Appendix III, Table 29.

MARINE SHELL (three specimens)

Three marine shell items were recovered. Two are **Oliva sayana** shell beads or tinklers; the other specimen is a bivalve fragment. A discussion of marine shell artifacts in south Texas is provided in Part I of this report.

Shell Tinklers (two specimens; Fig. 36,a,b)

Two shell tinkler specimens are identified as **Oliva sayana** (Andrews 1977:153). One specimen (Lot No. 730) is fragmentary with a portion of the outer whorl missing. The spires of both specimens have been cut off, and the resulting edges were smoothed. Near the smaller end of the complete specimen a wide notch has been cut and is perpendicular to the length of the specimen (Fig. 36,a). **Oliva sayana** tinklers are common in the Brownsville complex, the Late Prehistoric complex present along the extreme southern portion of the Texas coast (Hester 1969).

Bivalve Fragment (one specimen; Fig. 36,c)

A split bivalve fragment has been identified as a cockle (**Trachycardium** sp.) fragment (Jim Markey, Ed Mokry, Jr., personal communication; Andrews 1977:217). The ridges of the shell have been worn smooth. The umbo has been broken off.

MUSSEL SHELL (one specimen; Fig. 36,d)

One lunate-shaped mussel shell specimen is probably a fragment of a fossilized mussel that has been stream rolled. It may have been collected from the nearby gravel bars of the Frio River during prehistoric times. Its purpose or function is unknown.

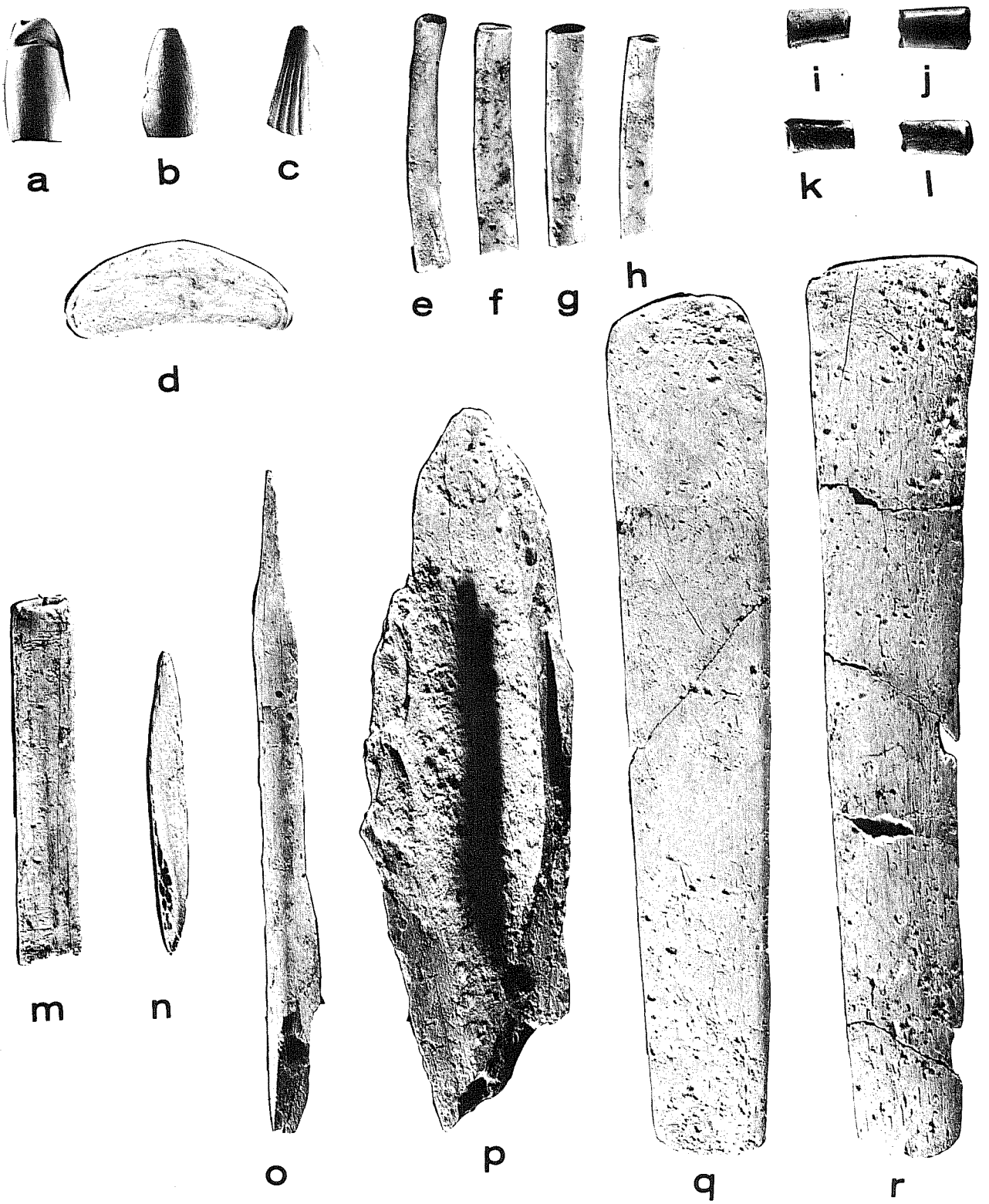

Figure 36. **UTSA Field School Excavations: Shell and Bone Artifacts.** a-b, shell tinklers; c, modified bivalve fragment; d, modified mussel shell; e-m, bone beads; n-r, bone tools.

BONE ARTIFACTS

Bone beads and an assortment of bone tools were recovered from the UTSA Field School excavations. As stated previously, bone preservation was excellent at 41 LK 201. Nine bone beads, two pointed bone tools, and three modified bone items will be described in detail below. Provenience and metric data are provided in Appendix III, Table 30.

BONE BEADS (nine specimens; Fig. 36,e-m)

The nine beads can be grouped by size. Four are quite small (1.1 to 1.2 cm in length) and were grooved and snapped from longer sections of animal bone (Fig. 36,i-l). Although the ends were smoothed, evidence of wide grooves cut into the bone prior to snapping is present on both ends of all four specimens. These beads are similar to one of the beads found during Phase II excavations (Fig. 23,l). Four other beads are longer (3.5 to 4.3 cm in length) and thus retain the natural curvature of the animal bone (Fig. 36,e-h). Similar bone beads were recovered from the upper levels of 41 MC 296 during Phase II (Hall, Hester, and Black 1986). The narrow grooves on either end of these beads are not as obvious as on the four smaller beads. One specimen (Lot No. 691) has been grooved and snapped, but the ends were not ground smooth. Another specimen (Lot No. 705), also grooved and snapped, has been smoothed along one end only. The other two beads (Lot Nos. 657 and 703) have been ground smooth on both ends. The final specimen (Fig. 36,m), assumed to be a bead, is the largest artifact of this type recovered from Choke Canyon during both phases of work. One end is missing, but the intact end appears to have been grooved, snapped, and smoothed. All nine beads were recovered from the central portion of the excavation block (Appendix III, Table 30).

BONE TOOLS (five specimens; Fig. 36,n-r)

Two pointed bone tools were recovered. One long fragmented bone section has been sharpened along one end to form an awl (Fig. 36,o). The remainder of the fragment was unaltered. The working end of the awl, approximately 3.1 cm long, is smoothed and polished. The other smaller specimen is bipointed, plano-convex in cross section, and smoothed and polished (Fig. 36,n). Its function is unknown.

A modified bison bone fragment has a gently rounded distal end (Fig. 36,p). The edges of the distal end are rounded and smooth. The remainder of the split bone fragment is unmodified. Similar tools were recovered from 41 MC 222 (personal observation) and 41 BX 228 (Black and McGraw 1985). It is assumed that this type of tool was used in bison butchering activities or in hide preparation functions.

Two spatulate bone tools were also recovered (Fig. 36,q,r). These long, flat tools were made from large bones which were split. The implements are wider at one end. The wider end of one tool is relatively straight, while the wider end of the other tool is convex. The edges of the wider or distal ends are worn along the interior or ventral side of the tool, particularly towards

one corner of the tool. The opposite or narrower end is convex edged. The entirety of both bone tools has been smoothed and polished. A sandstone artifact with four grooves (see ground stone artifacts, Group 3) was found in association with these tools and may have been used to smooth the edges. The bone tools were found in adjacent units (Appendix III, Table 30). Their function is unknown. They were associated with both bison and white-tailed deer and may have been used in hide processing activities. A similar bone implement was excavated from Mission San Juan Capistrano in Bexar County. Schuetz (1969:76-77) speculated that the tool was utilized in weaving activities by historic Indian groups living in the mission. A spatulate bone object was also recovered from the Pictograph Shelter in the Whitney Reservoir region (Stephenson 1970:142-143). It was located with Toyah focus materials within the time range of A.D. 1200 to 1700 (**ibid.**:157). A similar bone object, associated with the Toyah occupational zone, was recovered from excavations carried out by the 1981 Texas Archeological Society Field School at Rowe Valley in Williamson County (Grant D. Hall, personal communication).

It should be noted that although bone preservation was excellent, and numerous white-tailed deer elements were present at 41 LK 201, bone and antler flaking tools are noticeably absent. One antler billet was recovered during Phase II in association with Late Prehistoric items. Flaking tools fashioned from deer ulnas and antler tines are frequently reported from Late Prehistoric sites in central and south Texas and are present in several coastal collections. These tool forms are conspicuous by their absence at this site, which contains numerous chipped stone artifacts and great quantities of lithic debris.

CERAMICS

The UTSA Field School excavations at 41 LK 201 resulted in the recovery of one of the largest sherd samples obtained from a single site in south Texas. A total of 1476 sherds was recovered, with the greater number of sherds occurring in the southern portion of the excavation block (Fig. 37). Following the methods used by Black (1982), the sherds were placed into groups, each group presumably containing sherds from a single vessel. A total of nine groups was recognized, with Groups 2 and 8 corresponding to Phase II groupings (see Part I of this report). Additional vessels recognized in the UTSA Field School sample were assigned to Groups 9-19. Chris Slaughter and Casey Magan, UTSA students, reconstructed many segments of the ceramic vessels, thus, allowing for more accurate groupings of the sherds, as well as providing valuable information in regard to vessel shapes. Stephen L. Black assisted in the microscopic analysis of the sherds.

The sherds present in this sample fall within the bone-tempered ceramic tradition of south Texas. The vessels were made by the coil method, with the exception being a pipe bowl made by the "pinch pot" technique. Portions of several vessels were reconstructed, including one large olla. A variety of shapes are present, and these forms will be discussed within each group. Burnishing is the most common finishing technique. Many of the sherds are covered with or bear traces of fugitive red filming. Asphaltum was identified on one sherd, while traces of an unidentified black substance were

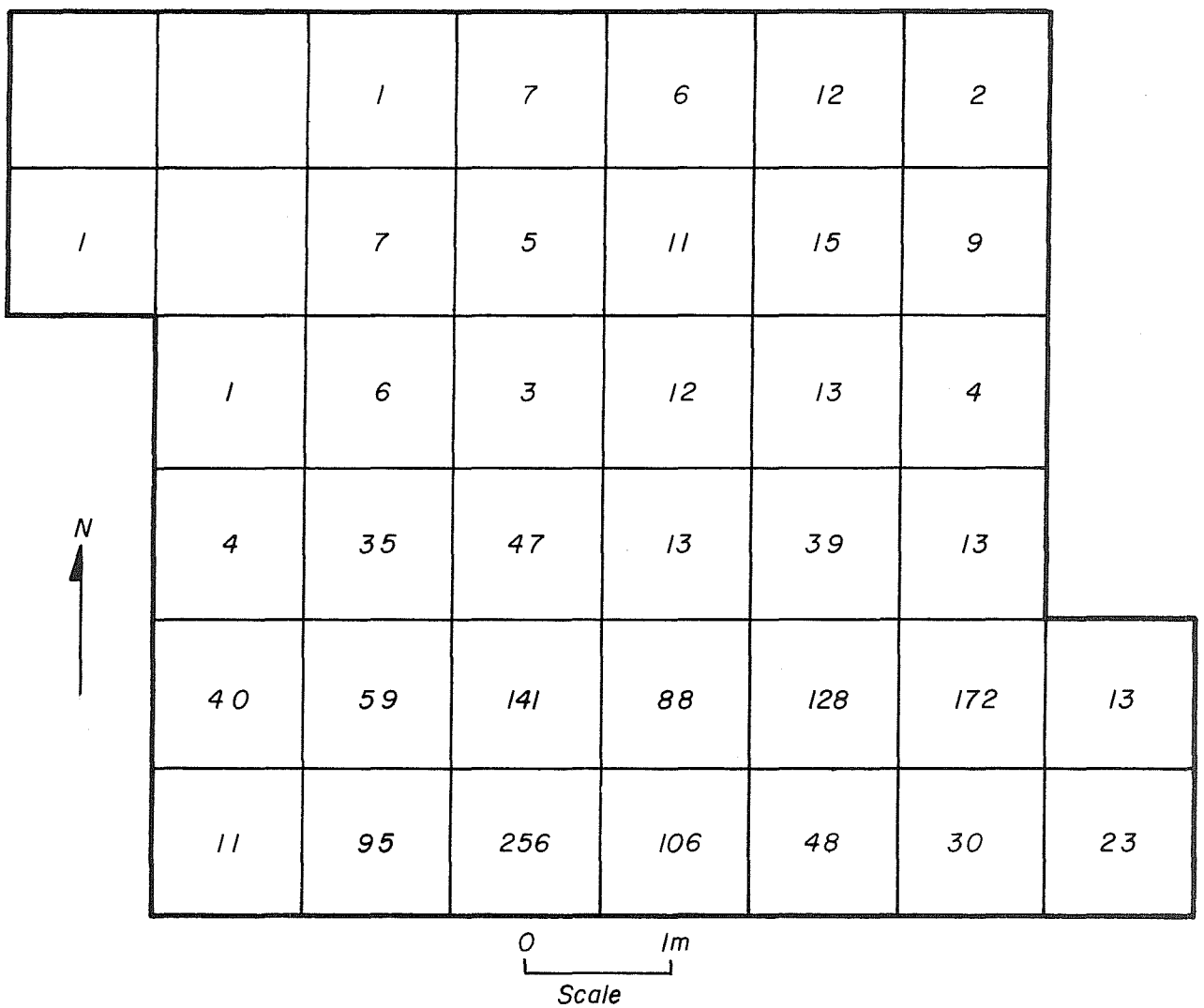

Figure 37. **UTSA Field School Excavations: Ceramic Sherd Total Per Unit.**

present on several other sherds. Dimensions were projected from reconstructed sections of vessels.

GROUP 2. (olla with fugitive red filming, highly burnished, profusely bone tempered; Fig. 38,a)

Total number of sherds: 198.

Vessel fragments: 196 body sherds, 2 rim sherds.

Sherd thickness: 0.3-0.5 cm.

Vessel dimensions: body diameter, approximately 19 cm.

Paste: profuse bone, sandy paste.

Core: 2/3 thickness, dark gray.

Spatial distribution: predominantly in southwestern portion of excavation block (Fig. 39,a).

Comments: Group 2 specimens consist primarily of body sherds with a few lip and neck sherds also present. These sherds excavated during the UTSA Field School are believed to correspond to the rim and neck sherds recovered during Phase II and described as Group 2 in Part I of this report. These two groups of sherds represent a single olla which was decorated with fugitive red film. Although the olla was not reconstructible, the exterior and interior features of the sherds are very similar as are the paste constituents. Several large sherds do fit together, and from these large sections a diameter of 22 cm was established.

The exterior portion of the vessel was well smoothed and highly burnished. Most of the sherds are covered with or bear traces of fugitive red filming. Beneath the fugitive red, exterior colors range from yellowish orange to reddish gray, while others vary from gray to grayish brown. Fire clouding is present on some portions of the vessel.

The interior of the vessel was well smoothed, so that all evidence of coiling has been removed. Wet brush marks are present. The interior of all the sherds, including those recovered during Phase II, exhibit a matte gray coating. Black (1982:425) described similar sherds and states that they have been clouded to an even color or incompletely oxidized.

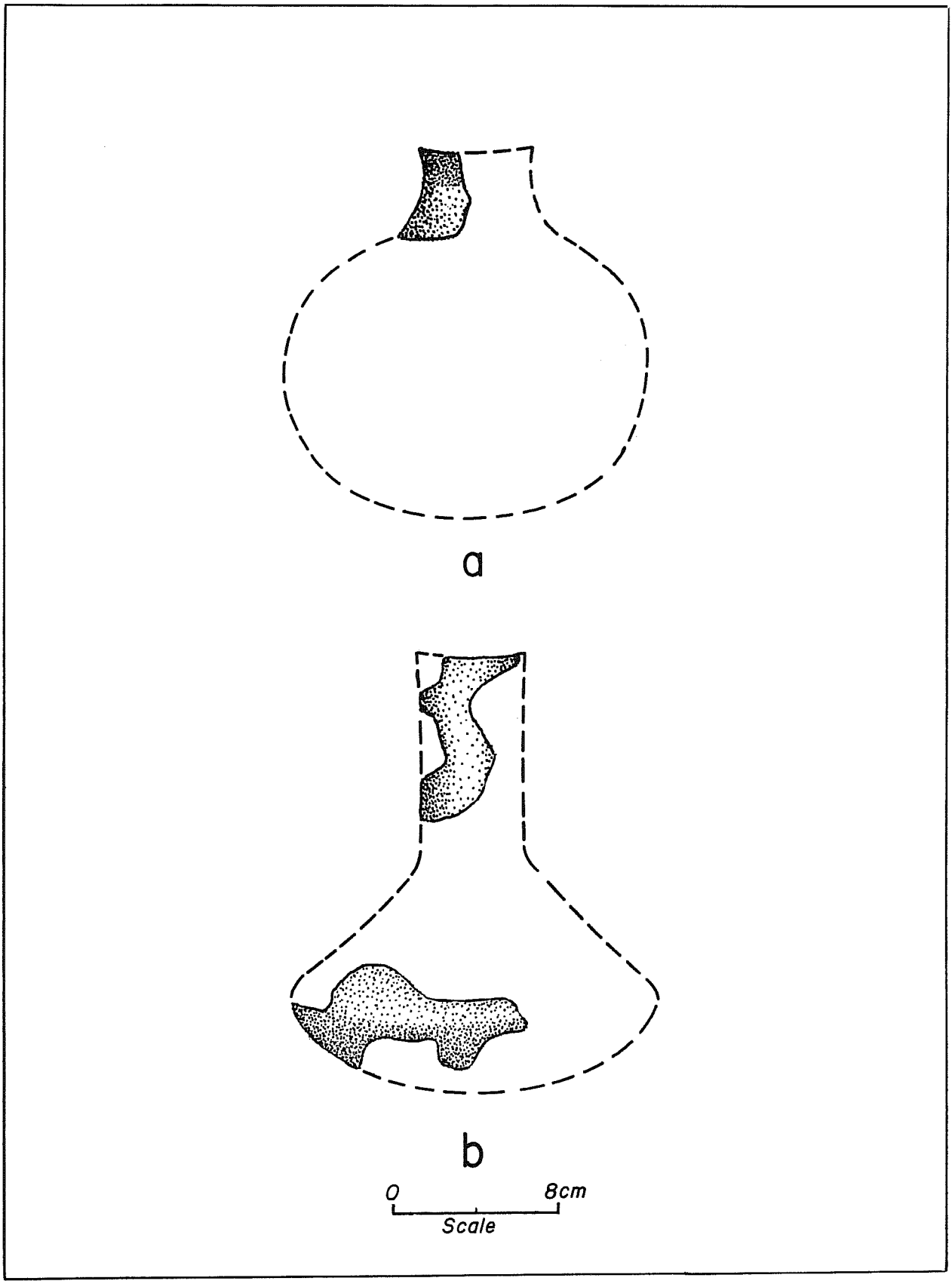

Figure 38. **UTSA Field School Excavations: Ceramic Vessels.** a, Group 2, olla with fugitive red filming; b, Group 10, bottle.

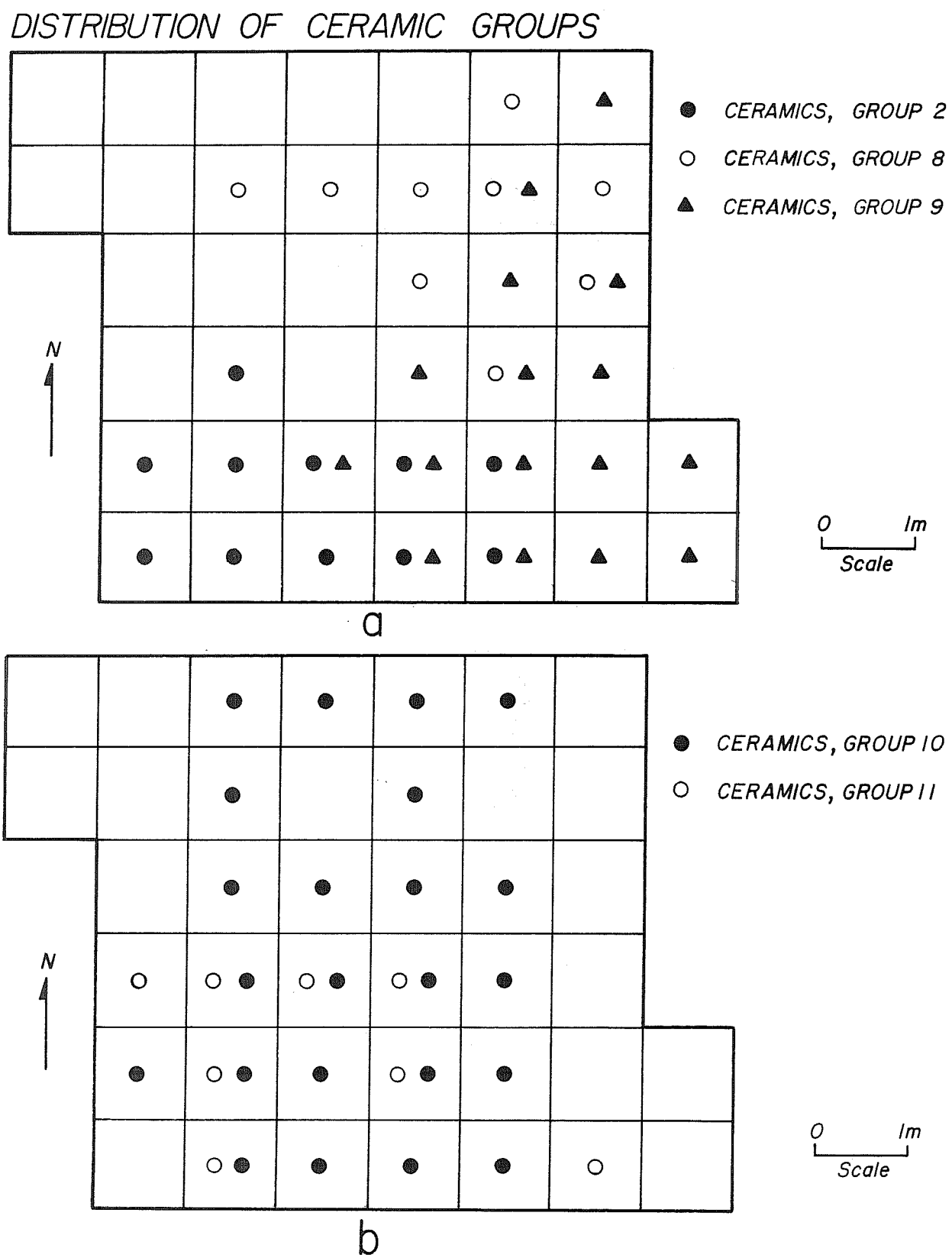

Figure 39. **UTSA Field School Excavations: Distribution of Ceramic Groups.** a, Groups 2, 8-9; b, Groups 10-11.

This vessel was an olla with a short neck and narrow opening. It appears to have been smaller than the more complete vessel recovered during the UTSA Field School excavations and designated Group 9.

GROUP 8. (burnished, fugitive red filming, traces of an unidentifiable black substance)

Total number of sherds: 24.

Vessel fragments: 24 body sherds.

Sherd thickness: 0.5-0.6 cm.

Paste: profuse bone, sandy paste.

Core: 2/3 thickness, dark gray.

Spatial distribution: northwestern corner of excavation block (Fig. 39,a).

Comments: This small group of sherds represents the lower portion of a globular vessel. No rim or neck sherds were recovered. Only a few of the sherds fit together. A group of six sherds, including one very large sherd (5.3 x 6.4 cm), was recovered during Phase II and are described as Group 8 in Part I of this report. A wide band (or perhaps several smaller bands) of an unidentified black substance is present on several of the larger sherds. Chemical tests indicated that the dark substance is not asphaltum. Fugitive red filming is also visible on many of the sherds. The unidentified black substance appears to have been applied over the red coloring.

The exterior surface has been smoothed and burnished. Fire clouding is present on several sherds. Exterior hues range from yellowish browns to brownish grays to blackened areas produced by the fire clouding. The interior portion ranges in color from orangish hues to dark gray shades. The interior has been somewhat smoothed, although coil ridges are still visible.

GROUP 9. (large olla with burnished exterior)

Total number of sherds: 502.

Vessel fragments: 13 rim sherds, 488 body sherds, one handle.

Sherd thickness: 0.35-0.60 cm.

Vessel dimensions: height, 24 cm.
rim diameter, 10 cm.
neck diameter, 9 cm.
body diameter, 25.3 cm.

Paste: slightly porous; crushed bone temper; very little sand, occasional well-rounded clear quartzite grains; occasional red hematite chunks.

Core: >2/3 thickness; light gray.

Spatial distribution: southeastern corner, concentrated in Unit G (Fig. 39,a).

Comments: This large olla, globular in shape with a constricted neck and outward flaring rim, was almost totally reconstructed (Fig. 40). It is the largest vessel recovered from the site. The thin-walled olla with a flat base was made by the coiling method.

The exterior surface displays a wide range of colors--from pale yellows to reddish yellows, from reddish browns to dark grays. The interior shows less color variability, with hues being primarily yellowish red to reddish orange. On the exterior, wide smoothing marks run vertically along the neck and rim. These marks terminate where the neck meets the shoulder of the vessel. This upper portion of the vessel has a slight degree of burnishing. The lower portion of the vessel is highly burnished. Marks attributable to smoothing and/or burnishing run around the circumference of the vessel. Other exterior features include several fire-clouded areas and occasional incised lines which do not appear to be decorative.

The interior has been moderately smoothed. Coil lines are visible as are brush marks which resulted from minimal smoothing of the interior coil lines. The interior of the basal portion, however, has been well smoothed.

The lip of the rim has been somewhat flattened at several intervals, while other portions appear rounded or tapered to a point. The rim varies in thickness. A thick handle fragment attached to one body sherd was also recovered. Although this handle fragment could not be affixed to the vessel, it is very similar in color and composition to the other sherds of Group 9. Approximately one-third of the neck and rim portion are missing, and it is assumed

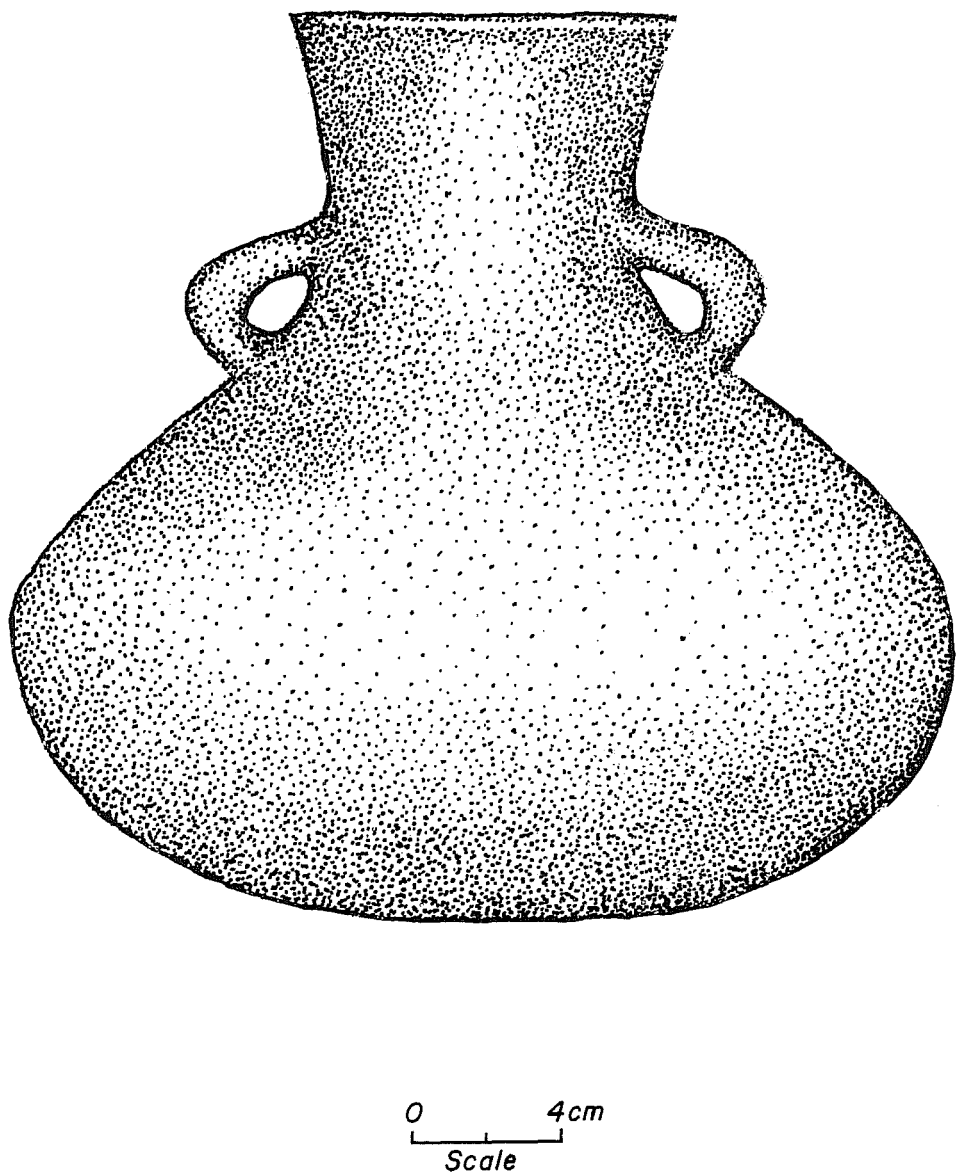

Figure 40. **UTSA Field School Excavations: Ceramic Olla (Group 9).**

that the handle was originally attached to this missing portion.

GROUP 10. (bottle, profusely bone tempered)

Sherds representing Group 10 appear to represent a single bottlelike vessel. Although many sherds are missing and the upper and lower portions could not be joined together, it is assumed that the sherds are from the same vessel. The basal or lower portion of the vessel will be discussed as Group 10A, and the bottle neck or upper portion will be described as Group 10B. Suggested vessel shape is presented in Figure 38,b. Reconstructed bottlelike vessels are very rare in published accounts of south Texas ceramic assemblages.

Group 10A. (basal portion of vessel)

Total number of sherds: 182.

Vessel fragments: 182 body sherds.

Sherd thickness: 0.6-1.0 cm.

Vessel dimensions: body diameter, 19 cm.

Paste: profuse bone; a few sand crystals; occasional tiny fragments of sandstone.

Core: >2/3 thickness, dark gray.

Spatial distribution: southwestern and central portion of excavation block (Fig. 39,b).

Comments: Two segments of the widest part of the lower portion of the vessel were reconstructed. From these segments, a diameter of 21 cm was estimated. At the widest part of the vessel, the walls of the vessel turn sharply inward towards the base and towards the upper part of the vessel, resulting in a squat body.

The burnished exterior has been well smoothed and varies in color from dark tan to fire-clouded, blackened areas. The interior has been poorly smoothed and appears grayish black due to incomplete oxidation during the firing process.

Group 10B. (bottle neck portion of vessel)

Total number of sherds: 87.

Vessel fragments: 10 rim sherds, 77 neck sherds.

Sherd thickness: 0.7-0.9 cm.

Vessel dimensions: neck diameter, 6 cm.
rim diameter, 7 cm.

Paste: profuse bone; a few more sand crystals present than in Group 10A.

Core: >2/3 thickness, dark gray.

Spatial distribution: southwestern and central portion of excavation block (Fig. 39,b).

Comments: These sherds comprise the upper portion of a ceramic vessel with an elongated or bottlelike neck (Fig. 38,b). Two large sections have been reconstructed and appear to be portions of the same vessel.

The exterior portion of the neck has been burnished. Sherds range from dark tan to fire-clouded grays. The interior of the neck has been smoothed along the upper rim and is residue-free. However, 2.8 cm below the rim a thick, dark, charred residue is present and extends down the length of the neck. Its origin is unknown. The rim edge has an exterior beveled lip.

GROUP 11. (unburnished, profuse bone, sandy paste)

Total number of sherds: 41.

Vessel fragments: 2 rim sherds, 39 body sherds.

Sherd thickness: 0.4-0.6 cm.

Vessel dimensions: rim diameter, 8 cm.
body diameter, 26 cm.

Paste: profuse bone, sandy paste.

Core: >2/3 thickness, dark gray.

Spatial distribution: southern half of excavation block; widely scattered (Fig. 39,b).

Comments: This thin-walled vessel appears to have been an olla. The narrow mouth has a gently recurved, outward flaring lip. The neck was not very long since the curve to the shoulders begins approximately 2 cm below the rim.

This vessel is unusual in that it has not been burnished. Wide smoothing marks are present across the exterior (Fig. 41,e). Wet brush marks are present on the smoothed interior. The exterior and interior color is primarily tan with gray, fire-clouded blotches on the exterior. Only a small portion of the lip is present. One segment has been flattened, while another portion is slightly beveled on the interior.

GROUP 12. (profusely bone tempered, fine sandy paste)

Total number of sherds: 53.

Vessel fragments: 53 body sherds.

Sherd thickness: 0.6-0.7 cm.

Paste: profuse bone; fine sandy paste; well oxidized; porous; several hematite chunks.

Core: 2/3 thickness, zoned towards inside.

Spatial distribution: widely scattered from southwestern corner to northeastern corner of excavation block (Fig. 42,a).

Comments: The majority of the sherds in this group have a very distinctive orange exterior. Several others are gray as a result of fire clouding. The color of the interior of the sherds is dark gray. White specks of bone are very distinctive on both surfaces as well as along the broken edges. The exterior surfaces have been smoothed and burnished, although pitting is present on numerous sherds. The interior surfaces have been smoothed to remove coil lines. The vessel was probably an olla as several segments were reconstructed and demonstrate the recurved section of a neck which curves up to the rim and down and out to the shoulder.

GROUP 13. (profusely bone tempered, sandy paste, fugitive red filming)

Total number of sherds: 25.

Vessel fragments: 7 rim sherds, 18 body sherds.

Sherd thickness: 0.4-0.6 cm.

Vessel dimension: rim diameter, 13 cm.

Spatial distribution: northeastern portion of excavation block (Fig. 42,a).

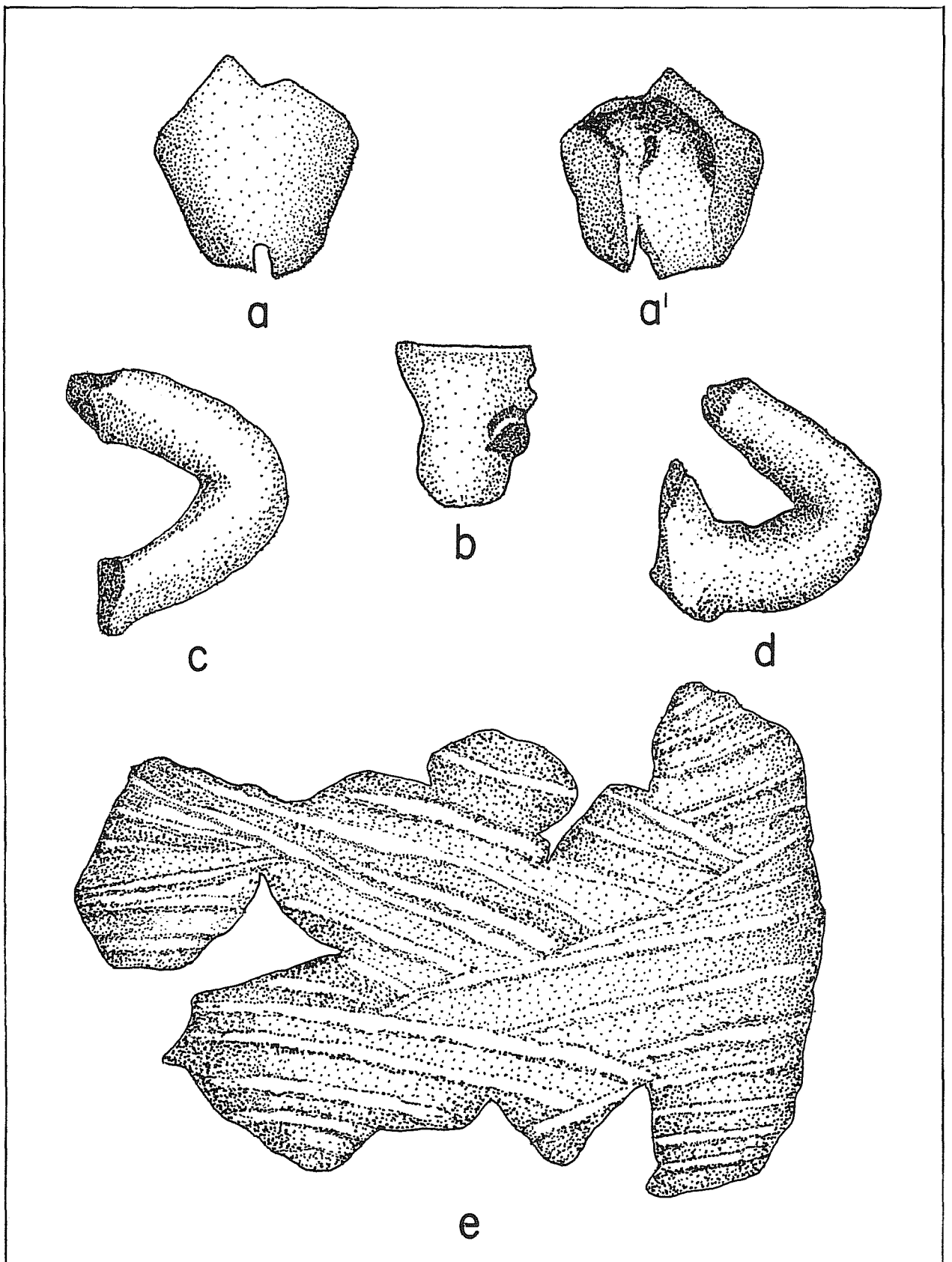

Figure 41. **UTSA Field School Excavations: Ceramic Fragments.** a,a', Group 15 (pipe bowl fragments); b, Group 18 (rim sherd with handle "scar"); c,d, Group 14 (handle fragments); e, Group 11 (unburnished pottery section with wide smoothing marks). Artifacts are illustrated actual size.

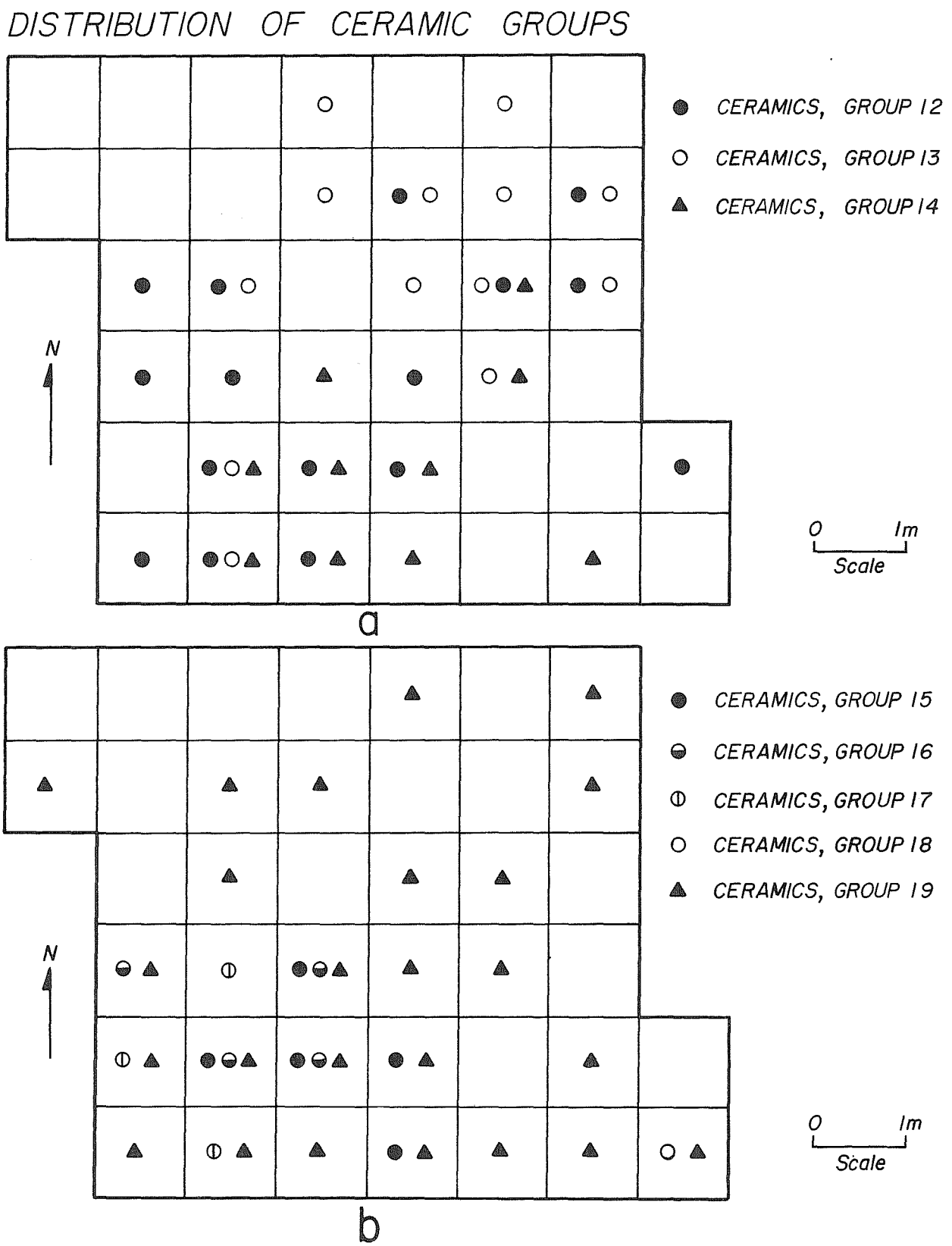

Figure 42. **UTSA Field School Excavations: Distribution of Ceramic Groups.** a, Groups 12-14; b, Groups 15-19.

Comments: This small group of sherds includes two rim sections which have been reconstructed and have traces of fugitive red film on the exterior surface. Most of the body sherds also have traces of the red coloring. The exterior surfaces have been smoothed and burnished. The interior surfaces have been smoothed, although roughly in some areas. The lip of the rim has been flattened.

GROUP 14. (profuse bone, sandy paste, highly burnished)

Total number of sherds: 80.

Vessel fragments: 2 handles, 78 body sherds.

Sherd thickness: 0.4-0.6 cm (body sherds).

Paste: profuse bone, sandy paste.

Core: >2/3 thickness, dark gray.

Spatial distribution: southern portion of excavation block (Fig. 42,a).

Comments: These thin sherds have dark gray to black exterior and interior surfaces. The exterior surfaces have been smoothed and highly burnished. The interior surfaces have a dull matte finish similar to the sherds in Group 3. The sherds in this group are somewhat similar to Group 3 sherds, but because they are thinner than Group 3 sherds they have been placed in a separate group. The body sherds give no hint of vessel form. Two handles are the only identifiable fragments (Fig. 41,c,d). One was broken in three sections and has been reconstructed. It fits with one body sherd and from this juncture it is obvious that this end of the handle was not pushed through the wall of the vessel during attachment. The end of the handle appears to have been pushed against the vessel wall, and then the edges of the handle were pressed flat against the wall. The other handle, broken in two fragments, was found in the same unit. Although fired to a dark tan color, it is similar in paste, size, and shape to the other handle.

GROUP 15. (pipe bowl)

Total number of sherds: 6.

Vessel thickness: 0.3-0.8 cm.

Paste: bone tempered.

Core: >2/3, dark gray.

Spatial distribution: south-central portion of excavation block (Fig. 42,b).

Comments: Two large fragments fit together to form the lower end of a pipe bowl (Fig. 41,a,a'). An opening, beveled towards the interior, is projected to have a diameter of 3 cm. The bowl flares outward to a diameter of 4 cm. The remainder or widest part of the pipe bowl is missing. Approximately 1.8 cm from the lower opening a thick, black residue is present. Four other sherds, with similar curvature and black residue, are believed to be fragments of the pipe bowl. The exterior of the sherds was smoothed and burnished. A pipe bowl fragment was recovered during Phase I (Black 1982:427-428). It was highly burnished and was free of residue.

GROUP 16. (pipe bowl)

Total number of sherds: 5.

Sherd thickness: 0.4-0.5 cm.

Vessel dimensions: midsection, 3.5 cm.

Paste: coarse, silty paste, occasional sand grains, moderate bone.

Core: >2/3 thickness, dark gray.

Spatial distribution: central western portion of excavation block (Fig. 42,b).

Comments: Three of these five sherds fit together forming a small circumference which appears to represent the midsection of a pipe bowl. The light tan exterior exhibits fire clouding and longitudinal burnishing marks. The dark gray exterior is poorly smoothed with "stick" marks present.

Whereas the pipe bowl identified as Group 15 was made by the "pinch pot" method, the Group 16 pipe bowl was made by the coiling method. Both forms are similar in that the bowl is wider at one end than at the other. The Group 16 pipe bowl is also thinner than the Group 15 pipe bowl and has a silty paste rather than a sandy paste.

GROUP 17. (pipe bowl [?])

Total number of sherds: 33.

Sherd thickness: 0.8-0.12 cm.

Paste: very fine silty paste with profuse bone; wood fragments in paste were completely oxidized leaving voids on the surface.

Core: >2/3 thickness, dark gray.

Spatial distribution: southwestern corner of excavation block (Fig. 42,b).

Comments: Because these sherds are very thick, curved, and exhibit a charred substance on the interior, they are presumed to represent pipe bowl fragments. The burnished exterior is light tan with gray fire clouding. The interior is poorly smoothed. The charred residue is present on only a few of the sherds. The paste contained wood or fiber fragments which were completely oxidized, resulting in voids visible on the surface of the sherds.

GROUP 18. (burnished, fine sandy paste, very little bone)

Total number of sherds: 5.

Vessel fragments: 1 rim sherd, 3 body sherds, 1 handle fragment.

Sherd thickness: 0.5-0.7 cm.

Paste: fine sandy paste with occasional larger sand grains; very sparse bone.

Core: 2/3 thickness, dark gray.

Spatial distribution: southeastern corner (Fig. 42,b).

Comments: These sherds have a burnished exterior and smoothed interior. One rim sherd was reattached to two body sherds, and the reconstructed segment exhibits a "scar" where a handle had been attached (Fig. 41,b). The handle associated with this group of sherds, however, is fragmentary and, thus, cannot be attached to the larger body segment. Several random notches are present on the handle fragment; they are believed to be accidental rather than decorative marks. The edge of the rim sherd has been flattened. These sherds are somewhat similar to Group 6 sherds described for Phase I (Black 1982:427).

GROUP 19. (olla, highly burnished, thin-walled)

Total number of sherds:	100.
Vessel fragments:	17 rim sherds, 83 body sherds.
Sherd thickness:	0.4-0.5 cm.
Paste:	fine silty matrix with profuse bone; occasional coarse sand grains.
Core:	>2/3 thickness, dark gray.
Spatial distribution:	scattered over most of excavation block with concentration along southern end of excavation block (Fig. 42,b).
Comments:	These sherds have a very smooth, highly burnished, well-floated exterior surface. Exterior shades range from tan gray to light brown with occasional fire clouding. The interior appears burnished and smooth. The unoxidized interior surface is dark gray. Several recurved neck sherds and the thinned rim sherds suggest that the original vessel form was an olla.

MISCELLANEOUS SHERDS (135 sherds)

The sherds placed in the miscellaneous category are very small and, thus, it is difficult to confidently place them within previously defined groups.

DISCUSSION

The extremely well-preserved, large ceramic sample from 41 LK 201 offers a rare opportunity to study prehistoric ceramic technology in southern Texas in terms of clay and tempering agents, vessel construction, vessel shapes, decorative techniques, and spatial distribution of sherds. A total of 19 ceramic groups was identified. Each group is distinct enough to be recognized as sherds from a single vessel or, in a few cases, as sherds from several similar vessels. A great amount of volunteer time was spent reconstructing portions of the vessels so that groupings would be more accurate, vessel shapes could be determined, and decorative techniques could be assessed.

The majority of the sherds have a sandy paste and are bone tempered. The exception was Group 6 from Phase I which contained no bone. One other unusual occurrence was noted in Group 17. The paste of these sherds apparently contained wood fragments which had completely burned up, resulting in voids visible on the surface of the sherds. All of the vessels were made by the coil method, while the pipe bowls were apparently made by the "pinch pot" method. Lug handles were associated with several of the ollas

(Fig. 40). With the exception of Group 11, all of the vessels have burnished exteriors and poorly smoother interiors. Group 11 is an olla that had not been burnished and exhibits wide smoothing marks.

During Phase I, four ceramic forms were recognized in the Choke Canyon sample--ollas, bowls, jars, and pipe bowls. An olla, the most common form present at 41 LK 201, is a globular vessel with a restricted neck and outward flaring rim (Fig. 40). Presumably, it was used for carrying water; the constructed neck and narrow opening would have restricted spillage. Six ollas were recognized from the 41 LK 201 sample. Bowls and jar forms appear to be absent from the sherd sample, although several groups which did not produce reconstructible sections may represent these forms. Four pipe bowls were recovered, one from Phase I and three from the UTSA Field School excavations. One of the UTSA Field School pipes exhibited a charred organic substance on the interior. The nature of the organic substance was not determined. Bone or wooden tubes were probably used as stems. Site 41 LK 28, a nearby Archaic cemetery, contained one stone pipe bowl with bone stem intact (Hester 1980:Fig. 5.16). A fifth form, that of a bottle, was also present at 41 LK 201. Bottles have been rarely reported in south Texas and were not recognized in the sherd samples from other Choke Canyon sites. One group of sherds, possibly representing a bottle, was reported from the Berclair site in Goliad County (Hester and Parker 1970:9). The bottle from 41 LK 201 may have been used for cooking, since the neck portion of the bottle is coated with a charred residue. Absent from the sample were figurine fragments such as recovered from 41 MC 296 and 41 MC 55 (Hall, Hester, and Black 1986).

During the Phase I ceramic analysis, Black (1982:443-447) provided a discussion of surface coatings present on the sherds. Traces of fugitive red filming, asphaltum, and an unidentified black substance were present on several sherds from 41 LK 201. Fugitive red filming consists of a thin application of red mineral pigment probably derived from earthy hematite or red ocher (**ibid.**). Black described the red coating as extremely ephemeral, with traces of it generally observable only under magnification. From the Phase I sample of 576 sherds from 16 sites, Black also observed that fugitive red filming was apparently used only on bowl forms and generally appeared on the exterior, although several sherds exhibited the filming on the interior.

The large sample of sherds from 41 LK 201 has provided additional information on the use of this decorative technique. Bowl forms were not recognized at 41 LK 201, but four out of the 19 groups present at the site contained sherds with fugitive red filming. Three of these vessels are ollas. The red filming ranged in color from bright red to dark maroon. The presence of the coating was generally visible without the use of magnification. One vessel, identified as Group 2, is an olla with a band of maroon-colored film present on both the interior and exterior sides of the rim (Fig. 38,a). Most of the sherds from the neck and body of the vessel bear traces of a bright red coating. The darker shade of red around the rim may have resulted from firing the vessel upside down. This vessel would have been very striking in appearance. The sherds comprising Group 8 may represent an olla; certainly the curvature of the sherds suggests a globular form. Fugitive red filming and streaks of an unidentifiable black substance were present on several of the larger segments from Group 8. The black substance was chemically tested

and was not asphaltum. Group 13 consists of several rim sherds with fugitive red filming and 18 body sherds, most of which have been decorated with fugitive red filming. Group 4, from the Phase I investigations, also exhibited traces of the red coating. In this case it appears that the fugitive red filming was applied prior to firing and was applied to the entire exterior surface of the vessel rather than in decorative bands or lines.

Only one group contained sherds with asphaltum. Group 3B, consisting of only three sherds, contained one sherd with a black substance along two opposing edges. The sherd is very similar to three sherds identified as Group 3B during Phase I (Black 1982:426). The asphaltum was obviously used as a mending agent. Group 8 contained several sherds with traces of an identifiable black substance. It is presumed to have been used in conjunction with the red filming as a decorative technique. Black (1982:446) described similar traces of a black substance on a few of the Phase I sherds and speculated that the substance may have been postdepositional or an organic substance such as mesquite sap.

The spatial distribution of the sherds suggests clustering of many of the sherd groups recovered from the UTSA Field School excavations. The three largest groups (Groups 2, 9, and 10) show distinct clustering along the southern edge of the excavation block (Fig. 39,a,b). Sherds from Groups 9 and 10 were scattered over a large portion of the block, but large quantities of sherds were restricted to a few units.

In comparing the 41 LK 201 sherds to other Choke Canyon ceramic samples, the 41 LK 201 sherds are the best made and best preserved of the samples. The excellent preservation of the site allowed for reconstruction of large sections of several vessels and provided an assessment of decorative techniques for the latter portion of the Late Prehistoric period. The majority of the vessels are thin walled and well made. This observation, corroborated by the radiocarbon dates of A.D. 1510-1590 and A.D. 1470-1500 (MASCA corrected), indicates that the site represents an occupation occurring during the latter portion of the Late Prehistoric period. Earlier Late Prehistoric sites, such as 41 MC 55 and 41 MC 222, generally contained thick-walled, sandy paste pottery (Hall, Hester, and Black 1986). The 41 LK 201 ceramics suggest a greater degree of sophistication had developed in pottery production during the 16th century.

Additional comments on Choke Canyon ceramics can be found in Hall, Black and Graves (1982:390-453) and Hall, Hester, and Black (1986:337-391).

HISTORIC ARTIFACTS

Metal and glass items, dating to the Historic period, were recovered from the surface and upper levels of 41 LK 201. Similar items were collected during Phases I and II. Many of the artifacts were probably associated with several early structures near the general vicinity of 41 LK 201 (see Part I of this report). Descriptions and proveniences are provided in Appendix III, Table 31.

FAUNAL REMAINS

VERTEBRATE FAUNAL REMAINS

A thorough assessment of the vertebrate faunal remains for both Phase II and the UTSA Field School excavations is provided in Appendix V. An inventory of identified animal bone from the UTSA Field School excavation is provided by unit in Table 11. The Late Prehistoric levels of 41 LK 201 contained the usual wide array of animal remains as found at most south Texas Late Prehistoric sites (Hester 1975a, 1980). Large mammals represented are bison, pronghorn, and white-tailed deer (see Appendix V:209-211). A few elements were identified as peccary (javelina), but these may be intrusive. Smaller mammals are opossum, badger, raccoon, jackrabbit, and cottontail rabbit, with the latter being prevalent (see Appendix V:209-211).

Three species of fish, probably obtained from the adjacent slough, were identified as gar, catfish, and freshwater drum. The only identifiable bird elements were wild turkey, but fragments of other species of birds were also present (see Appendix V:211). Rattlesnake vertebrae were present, along with the vertebrae of smaller snakes which were not identifiable (see Appendix V:225). A variety of turtles were present--water turtle, box turtle, Texas tortoise, and softshell turtle (see Appendix V:225-228). One fragment of frog or toad was also recovered. Wood rat, field mouse, and cotton rat were the only rodents identified from the UTSA Field School sample.

Many species identified from the UTSA Field School sample were also present in the Late Prehistoric levels of the Phase II excavations; this data is presented in Table 12. Conversely, some species of animals were not common to both samples (see Table 12). One of the most obvious differences is in the varieties of rodents found during the Phase II excavations. This information is misleading. Rodents appear to be most numerous in the portion of the site excavated during Phase II, but the reason for this is that selected fine screen samples were analyzed from the Phase II sample but not from the UTSA Field School sample. Time and funding did not permit sorting and analysis of all the fine screen samples from 41 LK 201 and, thus, only a few samples were selected. Much of the microfauna in the UTSA Field School sample, no doubt, includes a variety of rodents.

FRESHWATER MUSSEL SHELLS

Freshwater mussel shells (unionids) were found throughout most units and levels of the excavation area. Counts and weights are provided in Appendix VII, Part II. The greatest amount of mussel shell was in the southeastern corner of the excavation block. Feature 12 was located in Unit N505 E1009 and contained 272 g of mussel shell (Fig. 25,a), with 222 g of mussel shell outside of the concentration but within Unit N505 E1009. The units surrounding this quadrant also produced substantial, but lesser, amounts of mussel shell. Varying amounts of mussel shell were found in the remainder of the units (see Appendix VII, Part II).

TABLE 11. VERTEBRATE FAUNAL REMAINS--UTSA FIELD SCHOOL EXCAVATIONS

Units	Gar	Catfish	Freshwater Drum	Bird (I)	Wild Turkey	Frog/Toad	Snake (I)	Rattlesnake	Turtle (I)	Water Turtle	Box Turtle	Texas Tortoise	Spiny Softshell Turtle	Opossum	Artiodactyl (I)	Pronghorn	Bison	White-Tailed Deer	Peccary	Badger	Raccoon	Jackrabbit	Cottontail Rabbit	*Neotoma* sp. (I)	White-Footed Mouse	Hispid Cotton Rat
N504 E1008	×	×							×				×	×				×								
N504 E1009	×	×							×				×			×		×						×		
N504 E1010	×						×				×							×								
N504 E1011	×	×		×			×		×		×		×		×			×								
N504 E1012	×			×					×				×							×						
N504 E1013	×						×						×													
N504 E1014													×		×	×			×							
N505 E1008	×		×						×								×						×	×		
N505 E1009	×								×				×		×			×					×			×
N505 E1010	×												×										×			
N505 E1011		×									×		×			×		×				×	×			
N505 E1012													×			×						×				
N505 E1013	×			×					×				×					×					×			
N505 E1014	×	×						×	×									×					×			
N506 E1008												×										×				
N506 E1009	×								×		×		×				×						×	×		
N506 E1010									×	×													×			
N506 E1011	×								×		×		×										×			
N506 E1012	×		×	×					×														×			×
N506 E1013		×							×			×	×					×					×			
N507 E1008	×					×			×				×				×						×	×		×
N507 E1009	×	×							×			×	×					×	×				×	×		×
N507 E1010	×								×														×			
N507 E1011	×								×				×				×						×	×		
N507 E1012	×			×					×						×							×	×	×		
N507 E1013	×	×		×			×		×			×				×	×	×					×			
N508 E1007	×	×		×					×								×						×			
N508 E1008													×				×							×		
N508 E1009	×								×				×					×					×	×		
N508 E1010	×								×															×		×
N508 E1011	×								×									×				×	×			
N508 E1012	×	×							×		×	×			×								×	×	×	
N508 E1013	×		×	×			×		×		×		×		×			×			×	×	×			
N509 E1007	×								×								×									
N509 E1008	×				×				×									×								
N509 E1009	×	×							×									×					×			
N509 E1010	×	×		×			×		×						×						×		×	×		
N509 E1011	×								×		×							×					×	×		
N509 E1012	×	×	×									×	×										×	×		×
N509 E1013	×	×							×				×		×			×					×	×		

(I) - Species indeterminate

TABLE 12. COMPARATIVE DATA REGARDING ANIMAL BONE FROM THE PHASE II SAMPLE AND THE UTSA FIELD SCHOOL SAMPLE ATTRIBUTABLE TO THE LATE PREHISTORIC PERIOD

	Phase II	UTSA Field School
Gar	×	×
Catfish	×	×
Freshwater Drum	×	×
Bird (I)	×	×
Wild Turkey	×	×
Frog/Toad	-	×
Alligator	×	-
Spiny Lizard	×	-
Snake (I)	×	×
Rattlesnake	-	×
Turtle (I)	×	×
Water Turtle	-	×
Box Turtle	×	×
Mud Turtle	×	-
Texas Tortoise	×	×
Spiny Softshell Turtle	-	×
Opossum	-	×
Artiodactyl (I)	×	×
Pronghorn	-	×
Bison	×	×
White-Tailed Deer	×	×
Peccary	×	×
Canis sp. (I)	×	-
Bobcat	×	-
Badger	×	×
Raccoon	×	×
Armadillo	×	-
Jackrabbit	×	×
Cottontail Rabbit	×	×
Mexican Spiny Pocket Mouse	×	-
Hispid Pocket Mouse	×	-
Pygmy Mouse	×	-
Pine Vole	×	-
Neotoma sp.	×	×
Muskrat	×	-
White-Footed Mouse	-	×
Harvest Mouse	×	-
Hispid Cotton Rat	×	×
Squirrel	×	-

I = Species indeterminate
x = Species present
- = Species absent

Freshwater mussel shells were found at the majority, if not all, of the prehistoric sites investigated in Choke Canyon. They represent an important part of the aboriginal diet, a food source that was readily available in the Frio River valley (Murray 1982:541-555).

RABDOTUS LAND SNAILS

Rabdotus land snails were recovered from the UTSA Field School excavations, but not in the great quantities that were present in the Late Prehistoric zone in Area B during Phase II (see Appendix II, Table 20). One very large concentration was exposed in Level 3 of the northern part of Area B during Phase II which contained several thousand snail shells (Fig. 10). The total number of **Rabdotus** snails from the 20 cm excavated during the UTSA Field School investigations ranged from 2 to 92 snails per quadrant (see Appendix VII, Part II).

Although a difference in snail totals is obvious from one part of the site to another, the importance of **Rabdotus** snails in the aboriginal diet at 41 LK 201 cannot be understated. Black (n.d.), in analyzing the most recent excavations at 41 JW 8, found that **Rabdotus** snails were not associated with bone clusters, although concentrations of both were present at the site. Black suggested that (a) snail gathering was not necessary when animal meat was available; (b) snail and meat processing/disposal activities were carried out by separate groups; or (c) the two subsistence activities were conducted at different times of the year during different occupations of the site. The two latter hypotheses would apply to 41 LK 201; the first suggestion does not apply since large numbers of **Rabdotus** snails and significant quantities of bone co-occurred in the area excavated during Phase II.

SUMMARY

The UTSA Field School excavations revealed an assemblage of artifacts and one radiocarbon date indicating that site 41 LK 201 was a major campsite occupied during the 16th century A.D. As discussed in Part I of this report, the site was also occupied during the Middle and Late Archaic periods. The UTSA Field School excavations were designed to carefully expose only the upper levels of a portion of the site in order to gain additional knowledge of the extensive Late Prehistoric occupational zone. The radiocarbon date of A.D. 1510-1590 (MASCA corrected) obtained by the UTSA Field School excavations conforms closely to the radicarbon date of A.D. 1470-1500 (MASCA corrected) derived from the upper levels of the Phase II investigations (Appendix IV). The material culture consisted of the following items: **Perdiz** arrow points, beveled knives, flake end scrapers, perforators or drills, bone-tempered ceramics, bone and shell artifacts, and an extensive array of faunal remains. These items are typical of the material culture found at many other south Texas sites which date to the 13th and 14th centuries (Hester 1981).

THE ARTIFACT ASSEMBLAGE

The chipped stone tool assemblage is dominated by **Perdiz** arrow points. During Phases I and II, **Perdiz** points were the only style of arrow points recovered. Of the 25 identifiable specimens in the UTSA Field School assemblage, 21 are **Perdiz** points. The four expanding stem arrow points found during the UTSA Field School investigations have characteristics of **Scallorn** and **Edwards** points, but do not possess all of the characteristics necessary to confidently place them in either of these formally defined types. These points apparently represent a minor style co-occurring with **Perdiz** points. Site 41 JW 8 also contained a few expanding stem arrow points occurring with a preponderance of **Perdiz** points (Black n.d.). Black (**ibid.**) describes them as atypical of formally defined types, such as **Scallorn** and **Edwards** arrow points. The Berclair site in Goliad County is, to my knowledge, the only site in south Texas thus far reported that contained **Perdiz** points as the only form of projectile point recovered with an extensive array of Late Prehistoric materials (Hester and Parker 1970). The Late Prehistoric period in Zavala County is represented by a variety of arrow points, with **Perdiz, Scallorn,** and triangular forms occurring most frequently (Hill and Hester 1973:11; Hester 1978a:1-23; Montgomery 1978:21).

Other chipped stone tools from 41 LK 201 are beveled knives, end scrapers, and drills or perforators; all of which are commonly associated with **Perdiz** points at the majority of Late Prehistoric sites in south Texas. It has been suggested that beveled knives were used to butcher bison (Brown **et al.** 1982:55). In assessing the wear patterns present on beveled knives from 41 JW 8, Black (n.d.) observed that extensively rounded and polished edges on flake ridges on a majority of specimens suggest flake usage on soft material such as meat and hide. At 41 LK 201, the association of these tools with bison, white-tailed deer, and pronghorn would lend support to the theory that these beveled edged tools were used in butchering bison and possibly other artiodactyls during the Late Prehistoric period. The end scrapers and drills probably represent hide processing and working tools.

The cores, chipped stone tools, and flake debitage indicate that tool production was carried out at the site. However, very few thick bifaces (defined as bifaces measuring 1.3 cm or more in thickness) were recovered. As at other south Texas sites (Hester and Hill 1975:9; Hester 1978c:24-27; Montgomery 1978:21, 130; Hall, Hester, and Black 1986), it is obvious that the majority of chipped stone tools (arrow points, end scrapers, beveled knives, and perforators) in the Late Prehistoric tool kit were generally made on flakes.

Modified sandstone objects consisted of mano and metate fragments and several grooved pieces. The mano and metate fragments suggest seed, nut, and/or bean processing. The large amounts of animal bone at the site indicate that meat made up a major portion of the aboriginal diet. However, the presence of grinding elements in the Late Prehistoric component at 41 LK 201, as well as at other south Texas Late Prehistoric sites, indicates that plant foods were utilized (Hall, Hester, and Black 1986:405). The grooved stone objects could have been used to sharpen wood and bone implements, such as awls or they might have been used to smooth the edges of bone tools, such as the bone spatulates described earlier. Montgomery (1978:81) suggests that grooved

sandstone specimens could have been used to grind and prepare platforms during the flintknapping process.

The bone and shell artifacts from 41 LK 201 represent a variety of ornaments and tools. Several types of bone and shell ornaments were recovered. The marine shell ornaments suggest extra-regional trade contacts (Hester 1970). A bone awl, a bison bone scraping tool, and two spatulate items are indicative of hide working activities. The tools were probably made on the spot as needed to perform hide working tasks. Three grooved stone abraders were found in close proximity to three of the bone tools and, as stated above, may have been used to shape these objects.

The ceramic sherd sample recovered from the UTSA Field School excavations represent the best made and the best preserved of all the sherd samples found during both phases of work at Choke Canyon. Reconstructed vessel forms are several thin-walled ollas, a bottle, and several pipe bowls. Jar and bowl forms were not recognized, but may have been present in the sample that did not yield reconstructible forms. Fugitive red filming was used to decorate several of the vessels. Compared to somewhat earlier pottery-bearing sites, these ceramics suggest a greater degree of sophistication had developed in the art of pottery making by the mid-1400s (Stephen L. Black, personal communication).

SUBSISTENCE

The animal bone sample consisted of 20 identifiable species. White-tailed deer elements were the most common of the large game animal sample. Bison and pronghorn were also present. Cottontail rabbit was predominant in the small mammal sample, with jackrabbit, badger, raccoon, and rodents also present. In addition, a variety of fish, birds, snakes, and turtles were identified. Similar faunal assemblages have been reported from most south Texas Late Prehistoric sites (Hester 1981:158-159; Steele and Assad 1986; Black n.d.).

Freshwater mussels and **Rabdotus** snails were also utilized as food resources by the inhabitants of the site. Although the meat from both of these contain protein, the **Rabdotus** land snail contains more protein than river mussels. Ethnohistoric accounts indicate that the Mariame Indians of south Texas relied on prickly pear fruits and land snails as major food sources from late May to August (Campbell and Campbell 1981:17).

Plant food items undoubtedly played a large part in the subsistence regime of the prehistoric inhabitants of 41 LK 201. Unfortunately, preserved plant food items in archaeological sites are very rare and are generally limited to a few hackberry seeds and charred acorns or nuts (Hester 1980:159). Palynological studies have thus far revealed little information, since pollen is seldom preserved in the south Texas region (Hester 1977:28-29; Hester 1978d:38). Excavations at 41 JW 8 resulted in the recovery of charred plant parts--hackberry seeds, **Chenopodium** (goosefoot family) fruits, persimmon seeds, and **Helianthus** (sunflower) seeds (Black n.d.). Direct evidence of plant collecting at 41 LK 201 was not present. Hackberry seeds were noted, but because the excavations were so near the surface it is likely that the

seeds were modern. One mano and several metate fragments were recovered. They were probably used to process seeds, nuts, and beans.

ARTIFACT DISTRIBUTION

Artifact distributions revealed by these excavations suggest several possible activity areas. The two largest areas, based on the clustering of beveled knives and other thinned bifaces, and artiodactyl remains, suggest two separate living areas--one in the northeastern corner and the other along the western edge of the excavation block (Figs. 43; 44). Boundaries of these two areas somewhat overlap along the central portion of the northern edge of the excavation block. A third smaller area is located in the southeastern corner and is dominated by the presence of ceramic sherds. Because all of these areas fall along the edges of the excavation block, it is stressed that additional investigations may have revealed artifact patterning which would affect speculations regarding living areas and associated activities.

As shown in Figures 43 and 44, the northeastern corner contained nine beveled knives, two end scrapers, numerous cores, bifacial preforms and fragments, and numerous **Perdiz** points. Large quantities of lithic debris were also present. Large mammal remains were primarily white-tailed deer, with bison present in two quadrants and pronghorn present in one quadrant. Unidentifiable artiodactyl remains were also recovered. Both foetal and adult deer remains were recognized in the sample (Appendix V:231). Several articulated bison elements, consisting of a vertebra and several rib fragments, were recovered from Feature 11 in quadrant N507 E1013 (Appendix V:229). Apparently only portions of the bison, as represented in both this area and other areas of the site, were returned to the site after the kill (Appendix V:229). Other animal bone in this area included turtle, snake, fish, bird, rabbit, raccoon, and rodents. The single largest concentration of **Rabdotus** snail shells (a total of 92 snail shells) was recovered from Unit N507 E1012. Lesser amounts of snail shells were recovered from the other units in this area along with moderate amounts of mussel shell. Bone artifacts were represented by two beads, one scraping tool, and one awl. Approximately 100 sherds were also present in this area, but they represent a very small sample compared to the amounts found across the southern portion of the excavation block. Two grooved sandstone artifacts were also recovered.

It appears that a variety of functions were being carried out in the northeastern sector. Flintknapping is represented by numerous cores, thinned bifaces (many in the preform stage), **Perdiz** points, biface fragments, and large amounts of flake debitage. Noticeably absent from this area as well as other areas of excavation are hammerstones, ulna flakers, and antler tines generally used in lithic reduction. Food processing activities are represented by the presence of snails, mussels, and large quantities of animal bone. Most of the larger bone was spirally fractured for marrow retrieval (Appendix V:211, 214). Some of the cores found in this area may have been used to break the larger bone for marrow processing. Butchering activities are illustrated by the presence of animal bone associated with numerous beveled knives. Hide processing is suggested by the presence of two

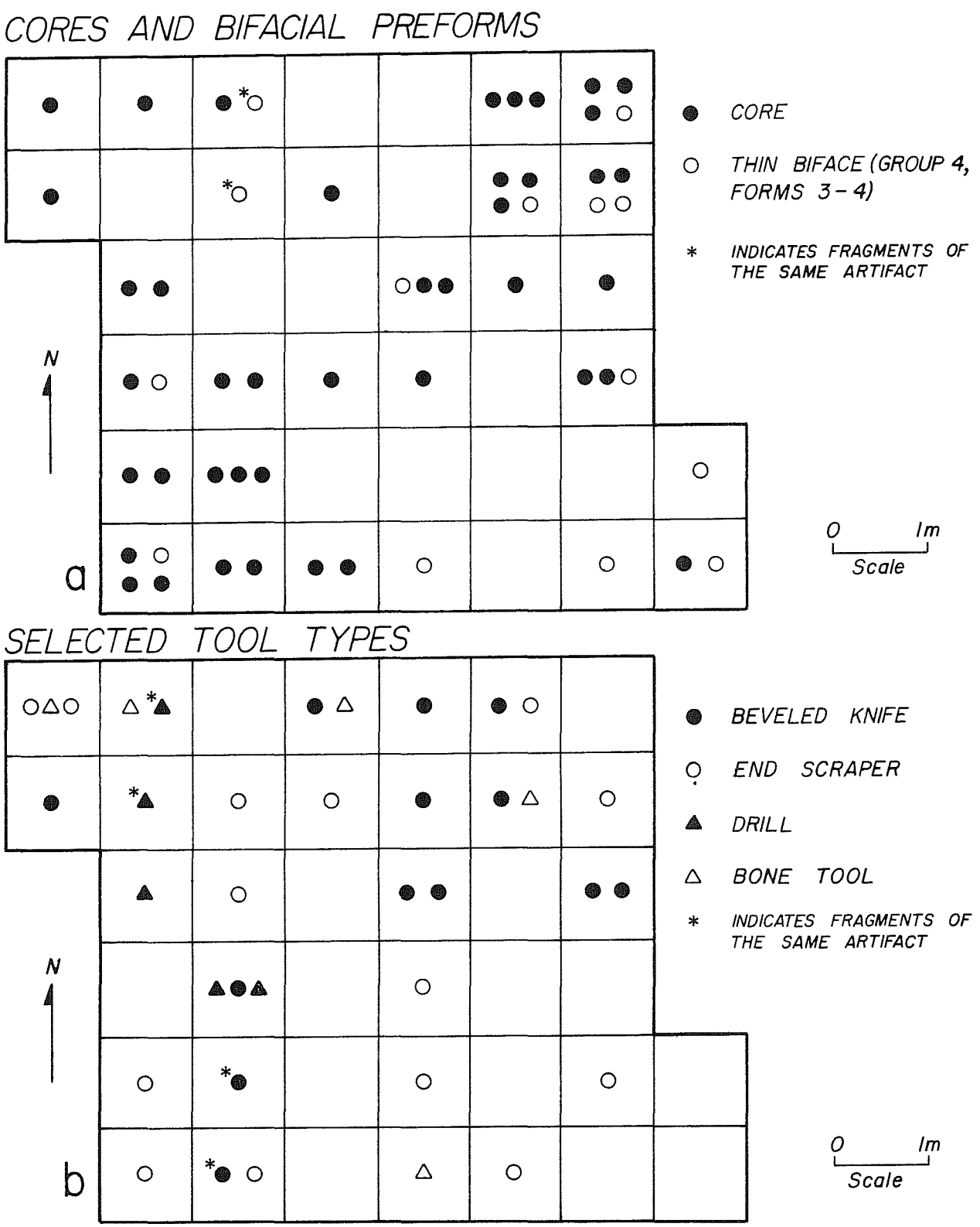

Figure 43. **UTSA Field School Excavations: Artifact Distribution.** a, cores and bifacial preforms; b, selected tool types.

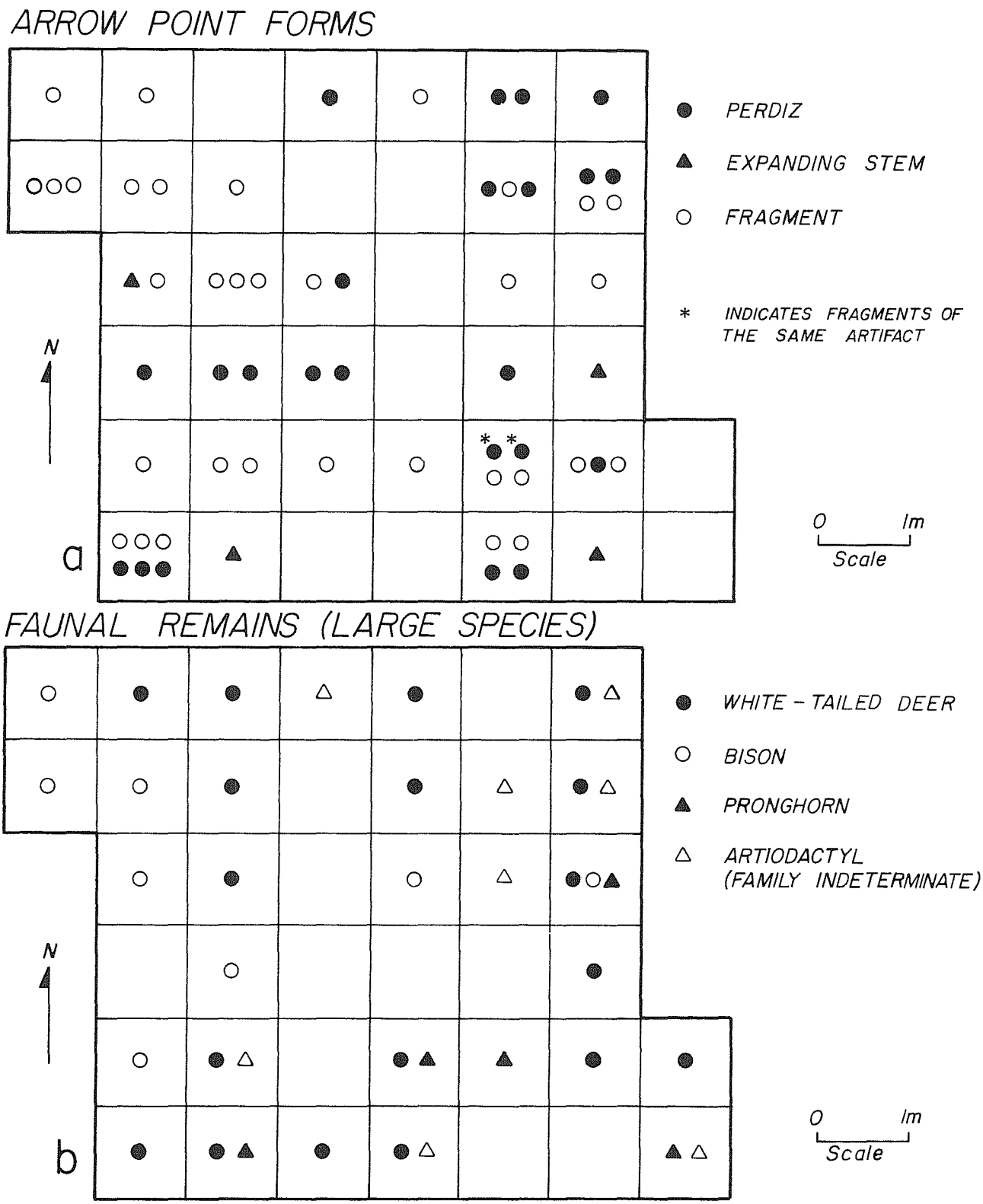

Figure 44. **UTSA Field School Excavations: Artifact Distribution.** a, arrow point forms; b, faunal remains (large species).

beveled knives which probably functioned as scrapers, one modified bison bone which probably functioned as a scraper, one bone awl, and three end scrapers.

The western edge of the excavation block also contains cultural items suggesting a variety of activities (Figs. 43; 44). Bison bone occurs more frequently in this portion of the site. White-tailed deer, pronghorn, unidentifiable artiodactyl, rabbits, opossum, fish, bird, turtles, and rodents were also present. Feature 12 is a concentration of mussel shell located in the northwestern part of the excavation block. A total of 44 complete shells was found overall in the quadrant and weighed 494 g. This concentration probably represents a food processing station. The other quadrants in the western region contained lesser amounts of mussel shell. **Rabdotus** snail shells did not occur in significant amounts. Beveled knives are represented by one complete specimen, one proximal fragment, and one distal end and one proximal fragment that fit together to form a complete specimen. Other chipped stone items include end scrapers, four perforators or drills, numerous cores, thin bifaces, and **Perdiz** points. Generally, moderate amounts of flake debitage were recovered. Other items include two bone spatulates (Fig. 25,d), bone beads, one **Oliva** shell tinkler, three metate fragments, and one grooved sandstone item. Large amounts of sherds were found in the southwestern corner of the excavation block. Sherds from practically all of the ceramic groups were present in this lower corner. In addition, three ceramic pipe fragments were found in this corner.

As with the northeastern sector, artifacts in the western portion of the site include various items which suggest many activities. Flintknapping is represented by cores, thinned bifaces, **Perdiz** points, and flakes and chips. Food processing activities are represented by animal remains, **Rabdotus** snail shells, and a large mussel shell concentration. Two adjacent units in the northwestern corner contained bison bone. The bison elements in Unit N508 E1007 were identified as the proximal portion of the left ulna, the proximal portion of a left radius, and the distal portion of the left humerus, all of which appear to be from a single individual (Appendix V:229). The animal was probably a mature female (Appendix V:229). Another tibial fragment was found in Unit N508 E1008 and exhibited cut marks (Appendix V:230). A beveled knife was present in the adjacent quadrant, N508 E1007, and this strong association lends credence to the hypothesis that beveled knives were used in butchering bison. Hide processing is indicated by chipped stone end scrapers and perforators, as well as two spatulate bone items. The ceramics recovered are portions of ollas, a bottle, and pipe bowls.

The third clustering of items occurs at the southeastern corner of the excavation block. The majority of the sherds comprising Group 9, a large olla, were found in this southeastern sector. Chipped stone items recovered are bifaces, **Perdiz** points, end scrapers, and significant quantities of lithic debris. Only one core was present in this area. Both white-tailed deer and pronghorn were present. Neither bison elements nor beveled knives were recovered from this portion of the excavation block. Other animal bone identified included rabbit, snake, bird, turtle, fish, badger, and rodents. Moderate amounts of mussel shell and **Rabdotus** snail shells were present. This area could be an extension of either of the two previously discussed clusters of materials.

Although several clusters of artifacts which might suggest separate living areas are present, the interpretations are limited. All of the clusters occur along the edges of the excavation block, and additional excavations would be necessary to substantiate any conclusive statements that might be made regarding separation of living areas and activities associated with each area.

CONCLUDING REMARKS

The archaeological investigations at 41 LK 201 revealed a series of intermittent occupations which represent the Middle Archaic, Late Archaic, and Late Prehistoric periods. Radiocarbon dates range from 1300 B.C. (Hall, Black, and Graves 1982:652) to A.D. 1510-1590 (Appendix IV). While the Late Prehistoric occupation was extensive with numerous distinctive artifacts, the Middle and Late Archaic deposits contained few diagnostic chipped stone forms.

The Middle Archaic component, represented by the lower levels in Horizon 4, is associated with radiocarbon dates of 1300 B.C. (Hall, Black, and Graves 1982:652) and 840-820 B.C. and 720-660 B.C. (Appendix IV). Artifacts associated with this horizon are one **Pedernales** point and one distally beveled biface. Several burned rock features were also present. Apparently a Late Archaic occupational zone is represented in Horizon 3, which is associated with one radiocarbon date of 480 B.C. Artifacts from this horizon are one **Ensor** point; one unstemmed triangular biface; one large stemmed, unidentifiable biface; and five distally beveled tools, one of which is a **Nueces** scraper. Only one burned rock feature was present in these levels.

Based on Phases I and II investigations in the Choke Canyon area, it appears that changes in material culture occurred slowly (Hall, Hester, and Black 1986:412-415). Dart points are so seldom found in excavated context that a projectile point sequence for this part of south Texas has yet to be devised. Triangular or ovate forms are very common but are difficult to classify. Distally beveled tools are also common, and it appears that two defined types, Group 3 (Short, Broad, Triangular to Subrectangular) and Group 4 (Small Triangular to Subrectangular), are Middle and Late Archaic tool forms. Large burned rock features appear to represent specialized cooking facilities which are very common in Middle and Late Archaic contexts, but noticeably absent from Late Prehistoric sites (**ibid.**). Based on the Archaic components excavated at Choke Canyon, it is obvious that all classes of vertebrates (amphibians, reptiles, mammals, birds, and fishes) were utilized as food sources. The Archaic diet also included freshwater mussels and **Rabdotus** snails, while manos and metates are indicative of the part plant foods played in the aboriginal diet.

The upper excavated levels at the site contained a cultural inventory typical of other south Texas assemblages attributable to the latter portion of the Late Prehistoric period. Diagnostic items are **Perdiz** arrow points, beveled knives, bone-tempered pottery, end scrapers, perforators, bone and shell items, and a variety of faunal remains, including bison. Radiocarbon dates for these upper levels are A.D. 1470-1500 (MASCA corrected) and A.D. 1510-1590 (MASCA corrected).

Site 41 LK 201 was a major campsite during the 16th century A.D. The artifacts suggest a variety of activities--flintknapping, hunting, food processing, hide preparation, and bone tool and ornament production. Ceramics are present, but indications of ceramic production at the site were not recognized. The large quantity of bone indicates that hunting was a major activity. Contact with coastal groups is indicated by the presence of asphaltum (used as a ceramic mending agent) and marine shell ornaments in the artifact assemblage.

Many Late Prehistoric sites have been recorded in south Texas, and while some sites are very similar in terms of cultural materials and date from A.D. 1400 to A.D. 1650 (the late part of the Late Prehistoric period), other sites are characterized by slightly different tool assemblages and apparently date from A.D. 900 to A.D. 1400 (early Late Prehistoric period; Hall, Hester, and Black 1986:404).

Site 41 MC 222, excavated during Phases I and II of the Choke Canyon investigations, represents an early Late Prehistoric site (Hall, Black, and Graves 1982:238-246; Hall, Hester, and Black 1986:203-226, 404). Radiocarbon dates range from A.D. 1247 to A.D. 1500. Arrow points recovered from 41 MC 222 are **Scallorn, Edwards,** and straight stem forms. Other cultural materials recovered from 41 MC 222 are pottery, thin bifaces, mano and metate fragments, and a bone pin. Noticeably absent were trimmed flakes and beveled knives.

Site 41 MC 296 contained two Late Prehistoric components overlying a Late Archaic occupational zone. The earlier Late Prehistoric component, identified as Horizon 2, dates to A.D. 910 to A.D. 1230 (Hall, Hester, and Black 1986:152-176). **Scallorn** and **Edwards** points and two beveled knives were recovered. Noticeably absent were trimmed flakes. Only a few pottery sherds were present. The latter part of the Late Prehistoric component at 41 MC 296, identified as Horizon 1, is very similar to the Late Prehistoric component at 41 LK 201. Radiocarbon dates range from A.D. 1430 to A.D.1610 (Hall, Hester, and Black 1986:172). Diagnostic artifacts recovered are **Perdiz** points, beveled knives, trimmed flakes, and numerous pottery sherds. In addition, a metal knife and a **Guerrero** point were recovered which suggests contact between the latest aboriginal inhabitants and Europeans (**ibid.**:175). Faunal studies indicate that the Late Prehistoric inhabitants of 41 MC 296 hunted antelope, deer, and bison as well as many small animals. The arrow points, beveled knives, unifaces, and trimmed flakes suggest an economy reliant on the killing and processing of large mammals (Hall, Hester, and Black 1986:175-176). However, the quantities of mussel shells, land snails, and small animal bones cannot be overlooked and indicate that these elements of the food spectrum were also exploited. Grinding implements are indicative of the utilization of plant food items such as nuts, beans, and seeds in the aboriginal diet.

Other sites in this part of south Texas that contain Late Prehistoric components consisting of **Perdiz** arrow points, beveled knives, trimmed flakes, and pottery are 41 MC 55 (**ibid.**:137-148), the Berclair site in Goliad County (Hester and Parker 1970), and the Hinojosa site in Jim Wells County (Hester 1977; Black n.d.). The cultural assemblages from these sites are similar to Toyah phase sites in central Texas and indicate a strong correlation between

these two regions during the latter part of the Late Prehistoric period. The similarities suggest that either central Texas groups with distinctive cultural inventories (i.e., **Perdiz** arrow points, beveled knives, end scrapers, bone-tempered pottery) began moving into south Texas ca. A.D. 1350 (Black n.d.) or central Texas technological innovations were spreading southward at this time (Hester 1981:122). Although this problem cannot be resolved at this time, Phase II assessments of the Late Prehistoric period indicate that the answer may lie in future excavations of sites that date between A.D. 200 and A.D. 800. That time frame appears to represent the transition between the Archaic period and the introduction of technological innovations and other changes in cultural patterns that typify the Late Prehistoric period (Hall, Hester, and Black 1986:405, 413-414).

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APPENDIX I.

SCOPE OF WORK

CULTURAL RESOURCE MANAGEMENT PLAN AND
PHASE II INVESTIGATIONS
CHOKE CANYON RESERVOIR, NUECES RIVER PROJECT, TEXAS
SOLICITATION NO. 5B-V0835

The work to be performed under this contract has been formulated with the intention of completing the documentation of the significance of Choke Canyon cultural resources and assuring that irreplaceable resources are not destroyed by direct impacts of reservoir construction. The data retrieval program does not pretend to be, nor should it be, the basis for the ideal pure research endeavor in archeology which might be undertaken given unlimited funding and time. The data retrieval, analysis, and reporting aspects of work to be accomplished under this contract (Phase II Investigations) will constitute the initial implementation stages of a long-term Management Plan designed to preserve and protect the significant cultural resources of the Choke Canyon Archeological District. The Management Plan will consist of (1) the specifications of work to be performed under this contract and (2) the long-term management recommendations formulated by the contractor (see below) as they may be modified by the WPRS after further consultation with the Advisory Council and the SHPO.

The Phase I program identified the significance of the Choke Canyon cultural resources by defining a set of scientific research objectives upon which those resources have a bearing. The Phase II Investigations will be designed to assure that the potential contribution of the resources to the accomplishment of those objectives is not impaired.

The Phase II Investigations will consist of a program of field investigations including the intensive testing and evaluation of 62 sites and further extensive excavation of 22 sites (the scope of these investigations and the rationale behind the selection of sites for investigation is defined below). Due to time restrictions, field seasons cannot be restricted to summers only. The investigations will include the analysis of data generated and the preparation and submittal to the Government of a Final Investigative Report (or set of reports) which will document the research performed and present its findings.

The realization of the scientific objectives of the investigations and the formulation of a comprehensive long-term Cultural Resource Management Plan well in advance of the completion of construction (i.e., by the end of calendar year 1981) will require the continuous evaluation of data generated by investigations performed under this contract and the evaluation of the results of research performed under previously awarded contracts (all Phase I Final Investigative Reports are scheduled for completion by January 1980). Meticulous organization and highly competent staffing at all levels will be fundamental to the success of the program.

A. The Phase II Investigations

1. Intensive Testing (an estimated 4,100 person-hours of field work)--Sixty-two sites will be intensively tested in accordance with procedures defined for intensive testing under the Phase I contract and UTSA Recommendations Report. These sites comprise two groups, Site Group A (30 of the 113 sites located by Texas Tech in the Phase I survey) and Site Group B (32 sites which require intensive testing from among those located in the survey completed by UTSA in 1979). Level of effort is defined in terms of total person/hours based on prior experience with similar investigations in the project area. The actual time spent and extent of investigation at a given site will depend on conditions encountered in the field. UTSA recommendations in terms of person/hours per site for Site Groups A and B are shown below:

Site Group A: (Cultural Resources Institute temporary field numbers are shown in parentheses following each permanent site number.)

Recommended for evaluative effort totaling 125 person/hours per site (3 sites): 41 LK 128 (11), 41 LK 176 (81), 41 MC 201 (45).

Recommended for evaluative effort totaling 75 person/hours per site (17 sites): 41 LK 121 (4), 41 LK 127 (10), 41 LK 133 (16), 41 LK 142 (25), 41 LK 145 (28), 41 LK 149 (32), 41 LK 170 (75), 41 LK 174 (79), 41 LK 181(86), 41 LK 182 (87), 41 LK 190 (95), 41 LK 199 (106), 41 MC 196 (40), 41 MC 209 (53), 41 MC 212 (56), 41 MC 213 (57), 41 MC 226 (110).

Recommended for evaluative effort totaling 25 person/hours per site (10 sites): 41 LK 122 (5), 41 LK 136 (19), 41 LK 150 (33), 41 LK 153 (36), 41 LK 158 (63), 41 LK 162 (67), 41 LK 173 (78), 41 LK 180 (85), 41 LK 185 (90), 41 LK 191 (96).

Site Group B:

Recommended for evaluative effort totaling 125 person/hours per site (3 sites): 41 MC 260, 41 MC 276, 41 MC 296.

Recommended for evaluative effort totaling 75 person/hours per site (20 sites): 41 LK 234, 41 LK 236, 41 LK 241, 41 LK 243, 41 LK 247, 41 LK 250, 41 LK 252, 41 LK 253, 41 MC 234, 41 MC 238, 41 MC 242, 41 MC 251, 41 MC 266, 41 MC 268, 41 MC 275, 41 MC 280, 41 MC 282, 41 MC 286, 41 MC 293, 41 MC 294.

Recommended for evaluative effort totaling 25 person/hours per site (9 sites): 41 LK 239, 41 LK 245, 41 MC 235, 41 MC 246, 41 MC 257, 41 MC 270, 41 MC 284, 41 MC 288, 41 MC 290.

2. Extensive Excavation--The decision to open substantial areas of contiguous squares at any given site (extensive excavation) will be based on the application of the following criteria as stated in the UTSA Recommendations Report:

Achieving representation of the occupation of the different geological formations and land forms of the reservoir area, of the range of postulated functional site types, and of the range of cultural stages present. Additional consideration will be given to anticipated productivity of cultural residues, the presence of stratigraphy, site condition, presence of intact occupational features, site specific preservation factors, potential for yielding information on the pre-mid Archaic time period, presence of unusual artifactual remains, factors promoting or impeding data retrieval, and the anticipated impact of project construction to the site.

Site Group C: Twelve sites of those which have already been tested have been determined to meet the above criteria so completely that their extensive excavation is known to be required for Phase II Investigation. These sites (designated Site Group C) consist of the following:

Historic Sites (7)

Site	Estimated person/hours required for (field) investigation
41 LK 66	75
41 MC 15	100
41 MC 17	100
41 MC 192	175
41 MC 193	150
41 MC 194	50
41 MC 214	200
Total	850

Prehistoric Sites (5)

Site	Estimated person/hours required for (field) investigation
41 LK 8	200
41 LK 14	150
41 LK 201	170 + 2 days backhoe time
41 MC 29	150 + 1/2 day backhoe time
41 MC 222	180
Total	850

Site Group D: The remaining 10 sites (Group D sites) whose extensive excavation will complete Phase II field investigations will be selected according to the above criteria from a "pool" of 95 sites. As a number of the criteria are oriented toward achieving representation of different categories of sites, the characteristics of the 15 sites (Group C

and 41 LK 31/32, 41 LK 67, and 41 LK 202) at which extensive excavation has been completed, or is known to be required for Phase II, will heavily influence the selection of the remaining 10 (Group D) sites.

The "pool" from which the Group D sites are ultimately to be selected consists of:

a. Ten sites which have already been evaluated and which UTSA has advanced for additional consideration: 41 LK 52, 41 LK 53, 41 LK 74, 41 MC 13, 41 MC 15, 41 MC 39, 41 MC 55, 41 MC 56, 41 MC 84, and 41 MC 94.

b. Seventeen sites at which testing and evaluation procedures will be completed during 1979 under the Phase I contract: 41 LK 51, 41 LK 73, 41 LK 85, 41 LK 86, 41 LK 87, 41 LK 88, 41 LK 92, 41 LK 93, 41 LK 94, 41 LK 97, 41 MC 18, 41 MC 83, 41 MC 90, 41 MC 91, 41 MC 92, 41 MC 93, and 41 MC 171.

c. Six sites advanced as significant from among 19 evaluated by the Texas A&M Anthropology Research Laboratory crew: 41 LK 56, 41 MC 60, 41 MC 186, 41 MC 187, and 41 MC 188.

d. The 30 Group A sites (see above).

e. The 32 Group B sites (see above).

It is estimated that up to 1,500 person/hours and 1.5 days of backhoe time will be required to complete field investigations at the Group D sites.

In order to assure thorough organization and efficient comprehensive reporting of progress, a detailed and specific research framework for field work, analysis, and report preparation shall be specified by offerors. This framework shall consist of the definition of decision-making processes to be followed for (1) decisions related to the extent of testing and/or extensive excavations at specific sites (field decisions), (2) decisions on which sites to investigate (definition of research priorities), and (3) decisions on recommended preservation procedures (long-term management plan components).

B. Field Decisions

Previous Choke Canyon cultural resource investigation contracts have defined levels of effort to be performed at specific sites. The extent and depth of a site and the density of artifact deposits is often not fully realized until investigations are well underway. It has been suggested that future contracts specify that the number of person-hours expended at a particular site be determined by the Principal Investigator in the field (to reflect actual practice). This suggestion is incorporated; it will be the responsibility of the Principal Investigator to determine when each site has been adequately tested and/or excavated (the final approval of the "adequacy" of investigations still rests with the Contracting Officer). Thus the Principal Investigator will be responsible for "budgeting" the overall scope of work (defined above) between sites. The means by which these field

decisions will be reached must be clearly defined in the proposals of offerors.

A decision-making matrix approach (see attachment B) is suggested as appropriate. The approach to reaching field decisions, defined by the offeror, shall clearly define an objective and systematic framework for reaching those decisions. The advance definition of the approach to reaching field decisions should allow the contractor, without extensive narrative description, to document the rationale behind field decisions, the general nature of deposits encountered during investigation, and progress in investigation. The approach to be defined shall also clearly commit the contractor to field techniques of the same or better quality as those employed during Phase I and the previously completed mitigative excavation programs. A policy statement by the offeror should be sufficient and include details of excavation strategy such as: use of arbitrary vs. natural excavation units, mechanical equipment, screening, treatment of features, sample collection, and recording standards and procedures.

C. Definition of Research Priorities

Research priorities relate primarily to the application of the criteria defined above to the selection of Group D sites for extensive excavation and to timing of all investigative efforts to insure program success. Staffing, adequate to provide for continuous analysis of data generated by field work and its evaluation along with the results of previously awarded contracts, will be necessary.

The work will be organized in a fashion which will allow the formulation of yearly progress reports. These reports will document work performed, outline upcoming field work, suggest such changes in investigation strategy as new information and experience dictate, and assess progress toward program objectives. Such documentation is not only required as a matter of Federal procurement policy, but the WPRS will also require such documentation as the basis of periodic consultation with the SHPO and Advisory Council on progress of the program toward realizing research objectives. An additional determinant of the need to organize Phase II Investigations to allow comprehensive documentation of both work progress, and evaluation of progress toward achieving research objectives is related to the extent possibility that Phase II Investigations may discover resources of such scope and significance that their responsible investigation cannot be accomplished within the scope of work of the contract. Should substantial investigations be required beyond the scope of Phase II, congressional authorization to allocate additional funds will be required.

It is possible that cultural resources not previously discovered will be found. If so, required documentation should be completed as soon as possible so as to prevent costly construction delays or the destruction of important cultural resources by the construction contractor.

The framework presented below is suggested for the organization of work to be performed under the Cultural Resource Management Plan, Phase II Investigations contract. Offerors' proposals will comment upon the

framework: reasoned criticism and alternative suggestions are encouraged. Offerors' proposals will expand upon the framework, presenting the specifics of task assignment and staffing required to accomplish the work.

D. Proposed Organizational Framework

1. Initial period of advance planning and orientation.

2. First field season:

a. testing and evaluation of the 30 sites identified during the Texas Tech field work (Group A sites),

b. initiation of work at those of the 12 sites definitely scheduled for extensive excavation (Group C sites) at which more than one field season of work is anticipated or at which early construction impacts are possible, and

c. ongoing laboratory analysis and processing of data.

3. Interim

a. evaluation of the results of previous contracts,

b. ongoing analysis of data generated by field work and its evaluation,

c. preparation of yearly progress report (report to be submitted at least 60 calendar days before the planned date for the initiation of the next field season), and

d. consultation period (with WPRS and SHPO).

4. Second field season:

a. testing and evaluation of the 30 sites identified by UTSA in 1979 survey (Group B sites),

b. completion of work at the 12 Group C sites,

c. initiation of work at Group D sites which can be designated at that time as constituting components of the sample of 10 from the 95 site pool, and

d. ongoing laboratory analysis and processing of data.

5. Interim

a. evaluation of the results of previous contracts,

b. ongoing analysis of data generated by field work and its evaluation,

c. preparation of yearly progress report (as in 3.c. above) and presentation of the proposed long-term Cultural Resource Management Plan (to be submitted 90 calendar days prior to initiation of next field season), and

d. consultation (with WPRS and SHPO).

6. Third and final field season:

a. completion of all excavation field investigation,

b. completion of all preservation activities, and

c. ongoing laboratory analysis and processing of data.

7. Wrap-up:

a. submittal of yearly Progress Report within 3 weeks of final field season,

b. completion of the analysis of all data generated by the field work, and

c. prepare and submit final investigative report(s) within 52 months after date of award of contract.

E. Cultural Resource Management Plan Components

The contract and the recommendations resulting from Phase II Investigations will form a comprehensive Cultural Resource Management Plan for the Choke Canyon Archeological District. Accordingly, the nature and structure of those investigations will be influenced throughout by concerns for long-term **in situ** data preservation.

Many aspects of field work will be wholly or partially determined by the kind of project impacts anticipated. Such matters as detailed site mapping, placement of permanent datum points, the specifics of site excavation strategy, and the decision to backfill are aspects of field investigation strategy which could be considered as related to long-term data presentation.

Decisions on which sites to investigate (definition of research priorities) will also depend on balancing the need to collect data to evaluate site significance and the need to preserve the data base intact **in situ** wherever possible. Ninety calendar days prior to the initiation of the final field season, the contractor will furnish a draft of a detailed long-term Cultural Resource Management Plan (to take the form of the major portion of a Yearly Progress Report). Most of the initial phases of this plan will have already been accomplished through the recovery of important information in previous field seasons. The final season will complete the initial phase of the plan by completing those data recovery and preservation-related activities defined as the contractor's responsibility. The long-term

Cultural Resource Management Plan will recommend long-term and major structural programs to the Government, which it will be the Government's responsibility to put into operation.

Offerors will define in their initial proposals the nature of preservation-related activities to be performed by the contractor. The National Inundation Study, previously completed Choke Canyon investigations, the State Historic Preservation Officer, and other appropriate sources should be consulted. Such activities might include detailed mapping and/or placement of permanent datum markers, backfilling, application of soil cement, or other techniques to preserve unexcavated portions of sites.

Long-range programs or major structural activities which the contractor might recommend, but for which the Government and not the contractor would be responsible for implementing, might include: structural stabilization of portions of the future lakeshore and the development of a program to foster public awareness of the importance and fragility of the Choke Canyon cultural resources (possibly including the development of some sites as **in situ** displays).

The activities to be performed by the contractor shall be defined in offeror's proposals and the recommendations to the Government in the final yearly Progress Report.

APPENDIX II.
ARTIFACT PROVENIENCE AND METRIC DATA FOR PHASE II INVESTIGATIONS AT 41 LK 201

TABLE 13. PROVENIENCE AND METRIC DATA FOR CORES--PHASE II

Area	Unit	Level	Elevation	Length	Width	Thickness	Weight
			GROUP 1				
A	N490 E1043	4	98.45-98.35	6.9	5.8	3.2	143.2
A	N490 E1043	11	97.75-97.65	7.9	5.4	3.4	168.4
A	N490 E1044	13	97.55-97.45	4.8	4.7	4.2	134.7
B	N499 E996	5	98.95-98.85	7.8	4.0	2.8	120.0
B	N499 E997	14	98.05-97.95	7.9	4.6	4.3	162.4
B	N498 E996	14	98.05-97.95	5.6	4.7	3.2	79.9
B	N500 E997	16	97.85-97.75	10.3	8.4	5.5	549.2
A	N491 E1044	18	97.05-96.95	8.6	6.8	5.2	343.8
-	Surface	-	-	8.3	5.3	3.9	200.0
-	Surface	-	-	6.5	5.0	2.8	112.7
			GROUP 2				
A	N490 E1043	11	97.75-97.65	12.0	11.1	3.8	555.8
A	N490 E1043	12	97.65-97.55	9.7	6.4	4.3	340.6
B	N500 E998	7	98.75-98.65	6.8	5.4	4.2	149.1
A	N491 E1043	15	97.35-97.25	7.2	6.9	4.7	247.1
A	N491 E1043	15	97.35-97.25	8.2	6.3	5.2	314.6
A	N491 E1044	14	97.45-97.35	6.4	5.6	4.9	227.7
B	N497 E997	14	98.05-97.95	9.0	7.1	3.8	277.1
B	N498 E997	15	97.95-97.85	9.9	9.1	6.4	540.7
B	N498 E997	16	97.85-97.75	7.0	6.5	5.3	236.8
-	Surface	-	-	9.3	6.1	5.3	283.4
			GROUP 3				
A	N490 E1043	12	97.65-97.55	5.5	4.3	3.7	124.2
A	N491 E1043	10	97.85-97.75	7.1	5.3	3.6	115.4
B	N498 E996	2	99.25-99.15	7.4	5.8	3.4	123.3
B	N500 E997	2	99.25-99.15	5.2	4.7	3.1	63.2
B	N500 E998	3	99.15-99.05	4.3	3.5	3.5	68.3
-	Surface	-	-	6.6	6.1	4.7	77.3
			GROUP 5				
A	N490 E1044	5	98.35-98.25	5.3	5.0	2.7	75.5
A	N490 E1044	11	97.75-97.65	7.2	5.0	2.9	116.7
B	N498 E998	10	98.45-98.35	9.2	7.5	5.1	393.0
B	N500 E998	5	98.95-98.85	5.8	5.1	3.9	97.1

TABLE 13. (continued)

Area	Unit	Level	Elevation	Length	Width	Thickness	Weight
			GROUP 5 (continued)				
B	N500 E998	6	98.85-98.75	8.0	6.5	2.7	123.3
B	N498 E996	14	98.05-97.95	5.9	5.0	4.0	135.2
B	N498 E997	16	97.85-97.75	8.7	7.2	3.4	195.9
C	N510 E1021	8	98.85-98.80	7.6	5.4	4.2	184.7
A	N491 E1043	18	97.05-96.95	7.3	5.2	4.7	192.9
-	Surface	-	-	6.8	5.6	2.6	108.1
-	Surface	-	-	6.4	6.1	3.0	101.0
-	Surface	-	-	10.9	9.0	3.7	351.7
			GROUP 6				
A	N490 E1043	10	97.85-97.75	5.2	4.6	2.8	69.8
A	N490 E1044	10	97.85-97.75	4.1	3.6	3.3	67.1
B	N497 E998	7	98.75-98.65	5.1	3.7	2.6	45.4
B	N497 E998	10	98.45-98.35	5.3	4.3	3.5	68.8
B	N499 E996	2	99.25-99.15	3.9	3.3	1.9	20.9
B	N498 E996	13	98.15-98.05	5.3	4.9	2.6	63.3
B	N499 E998	14	98.05-97.95	6.4	5.0	3.0	90.5
B	N500 E997	13	98.15-98.05	4.9	3.8	3.1	62.2
			GROUP 9				
B	N497 E998	10	98.45-98.35	**	**	**	**
B	N498 E996	3	99.15-99.05	**	**	**	**
B	N498 E996	3	99.15-99.05	**	**	**	**
B	N498 E997	4	99.05-98.95	**	**	**	**
B	N497 E997	11	98.35-98.25	**	**	**	**
B	N498 E996	13	98.15-98.05	**	**	**	**
B	N498 E996	13	98.15-98.05	**	**	**	**
B	N498 E996	13	98.15-98.05	**	**	**	**
B	N500 E996	13	98.15-98.05	**	**	**	**
B	N500 E997	13	98.15-98.05	**	**	**	**
B	N498 E996	14	98.05-97.95	**	**	**	**
B	N498 E996	14	98.05-97.95	**	**	**	**
B	N498 E996	14	98.05-97.95	**	**	**	**
B	N500 E998	17	97.75-97.65	**	**	**	**
A	N491 E1043	17	97.15-97.05	**	**	**	**
-	Surface	-	-	**	**	**	**
-	Surface	-	-	**	**	**	**

* Measurements or weights of incomplete specimens

** Measurements or weights not taken

TABLE 14. PROVENIENCE AND METRIC DATA FOR THICK BIFACES--PHASE II

Area	Form	Unit	Level	Elevation	Length	Width	Thickness	Weight
				GROUP 2				
A	--	N491 E1044	10	97.85-97.75	7.3	3.8	1.8	45.6
				GROUP 3				
B	-	N499 E998	12	98.25-98.15	5.4*	4.0	1.6	34.0*
A	-	N491 E1043	17	97.15-97.05	6.4	4.5	2.1	61.7
				GROUP 7				
A	1	N491 E1043	2	98.65-98.55	5.4*	5.3*	2.4	76.0*
B	3	N499 E997	3	99.15-99.05	4.0*	4.0*	1.4	23.2*
B	3	N500 E997	14	98.05-97.95	5.0*	3.3	1.5	19.4*
				GROUP 8				
A	-	N498 E997	2	99.25-99.15	5.6	3.7	1.6	26.0
A	-	N498 E997	13	98.15-98.05	6.3*	5.2	2.0	65.7*
-	-	Surface †	-	-	7.2	4.9*	2.0	70.0*
				GROUP 9				
B	-	N499 E996	3	99.15-99.05	3.9*	4.8*	1.2*	17.7*
B	-	N499 E997	3	99.15-99.05	3.9*	4.3*	1.6*	21.0*
B	-	N498 E996	3	99.15-99.05	5.0*	3.5*	2.5*	24.4*
B	-	N497 E996	4	99.05-98.95	7.0*	3.5*	2.2*	50.4*

* Measurements or weights of incomplete specimens

† Surface to upper 20 cm from trench dug for water screens

TABLE 15. PROVENIENCE AND METRIC DATA FOR STEMMED THIN BIFACES--PHASE II

Area	Specimen Number	Type	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
					GROUP 1, FORM 1								
B	5	-	N498 E996	18	97.65-97.55	6.9	2.2	0.8	1.5	2.1	1.9	12.0	19
A	9	-	N490 E1044	10	98.85-98.75	8.9	2.7	0.7*	2.0	2.2	2.2	18.5*	19
					GROUP 1, FORM 2								
B	7	-	N500 E998	6	98.85-98.75	6.5	2.5	0.8	1.7	1.9	1.9	14.7	19
					GROUP 1, FORM 3								
A	21	-	N491 E1043	11	98.75-98.65	4.5*	2.1	0.7	1.2	1.6*	1.3	6.6*	19
					GROUP 1, FORM 4								
B	3	**Perdiz**	N497 E997	4	99.05-98.95	3.6	1.5	0.5	1.2	0.7	0.7	2.0	20
B	4	**Perdiz**	N498 E996	2	99.25-99.15	2.9*	1.8*	0.3	0.9	0.5	0.5	**	20
B	5	**Perdiz**	N498 E996	3	99.15-99.05	4.5	1.4	0.4	1.2	0.6	0.6	1.6	20
B	6	**Perdiz**	N498 E997	3	99.15-99.05	3.1	1.7	0.4	0.9	0.6	0.6	3.7	20
B	7	**Perdiz**	N498 E997	3	99.15-99.05	2.5	1.2	0.1	0.9	0.5	0.5	0.4	20
B	8	**Perdiz**	N498 E997	3	99.15-99.05	5.0	1.8	0.6	1.2	0.8	0.8	2.0	20
B	9	**Perdiz**	N499 E997	2	99.25-99.15	2.2*	1.5	0.3	1.2	0.6	0.6	**	20
B	10	**Perdiz**	N499 E997	3	99.15-99.05	3.0	1.5*	0.3	1.2	0.6	0.6	0.9*	20
B	11	**Perdiz**	N499 E998	3	99.15-99.05	3.4	1.8	0.5	1.0	0.8	0.8	2.4	20
B	12	**Perdiz**	N500 E997	3	99.15-99.05	3.0	1.7	0.2	0.8	0.5	0.5	0.9	20
B	13	**Perdiz**	N500 E998	3	99.15-99.05	3.0*	1.7	0.3	1.1	0.6	0.6	1.4*	20
B	14	**Perdiz**	N500 E998	3	99.15-99.05	2.5	1.5	0.2	1.1	0.6	0.6	0.8	20

TABLE 15. (continued)

Area	Specimen Number	Type	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
					GROUP 1, FORM 4 (continued)								
-	15	**Perdiz**	Surface	-	-	3.5	1.5	0.2	0.8	0.5	0.5	1.3	20
A	59	**Perdiz**	N490 E1043	5	98.35-98.25	2.2*	1.7	0.3	0.8	0.7	0.7	**	20
B	60	**Perdiz**	N500 E998	4	99.05-98.95	1.8	1.4	0.2	0.6	0.7	0.7	0.4	20
-	61	**Perdiz**	Surface	-	-	2.9	1.3	0.2	0.7	0.5	0.5	0.9	20
-	84	**Perdiz**	N499 E998	3	99.15-99.05	2.5	1.6	0.4	0.6	0.6	0.6	1.4	20
					GROUP 1, FORM 7								
B	11	-	N497 E997	3	99.15-99.05	**	**	**	**	**	**	**	20
B	12	-	N497 E998	3	99.15-99.05	**	**	**	**	**	**	**	20
B	†13	-	[N498 E997 [N500 E998	4 3	99.15-99.05] 99.05-98.95]	**	**	**	**	**	**	**	-
B	14	-	N499 E997	4	99.05-98.95	**	2.0	1.2	**	**	0.8	**	-
B	-	-	N499 E997	11	98.35-98.25	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.05-98.95	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N500 E998	3	99.15-99.05	**	**	**	**	**	**	**	-

TABLE 15. (continued)

Area	Specimen Number	Type	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
GROUP 1, FORM 7 (continued)													
B	-	-	N499 E996	3	99.15-99.05	**	**	**	**	**	**	**	-
B	-	-	N499 E998	3	99.15-99.05	**	**	**	**	**	**	**	-
C	-	-	N510 E1020	6	98.95-98.90	**	**	**	**	**	**	**	-
C	-	-	N510 E1021	2	99.15-99.10	**	**	**	**	**	**	**	-
-	-	-	Surface	-	-	**	**	**	**	**	**	**	-

* Weights or measurements of incomplete specimens.

** Weights or measurements not taken.

† This specimen is two fragments pieced together.

TABLE 16. PROVENIENCE AND METRIC DATA FOR UNSTEMMED THIN BIFACES--PHASE II

Area	Specimen No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
				GROUP 2, FORM 2					
B	19	N499 E997	3	99.15-99.05	6.2	**	0.6	**	19
A	35	N490 E1043	10	97.85-97.75	**	2.9	0.7	**	19
				GROUP 3, FORM 1					
B	6	N500 E996	19	97.55-97.45	4.9	2.3	0.7	8.2	19
				GROUP 4, FORM 1					
B	14	N500 E998	4	99.05-98.95	5.3	1.9	0.6	5.4	21
				GROUP 4, FORM 2					
A	†2	[N498 E997 [N499 E998	3 1	99.15-99.05] Surf.-99.25]	8.1	2.0	0.4	5.7	21
-	3	Surface	-	-	5.2*	4.7	0.6	**	21
				GROUP 4, FORM 3					
B	†7	[N498 E996 [N500 E996	2 3	99.25-99.15] 99.15-99.05]	4.6	2.1	0.5	4.7	21
B	8	N498 E996	3	99.15-99.05	5.7	2.3	0.6	6.8	21
B	9	N499 E996	3	99.15-99.05	3.6	2.0	0.5	3.6	21
B	10	N499 E996	5	98.95-98.85	2.7*	2.3	0.4	3.4*	21
B	†11	[N499 E997 [N499 E997	3 4	99.15-99.05] 99.05-98.95]	5.6	3.5	0.5	11.7	21
-	12	Surface	-	-	6.1	3.5	0.7	16.9	21
				GROUP 4, FORM 4					
A	25	N491 E1044	11	97.75-97.65	**	**	**	**	-
B	26	N497 E996	3	99.15-99.05	**	**	**	**	-
B	27	N499 E996	2	99.25-99.15	**	**	**	**	-
C	28	N510 E1020	3	99.10-99.05	**	**	**	**	-
-	29	Surface	-	-	**	**	**	**	-
B	103	N497 E997	2	99.25-99.15	**	**	**	**	-
C	104	N510 E1020	2	99.15-99.10	**	**	**	**	-
-	126	Surface	-	-	**	**	**	**	-
-	127	Surface	-	-	**	**	**	**	-
-	128	Surface	-	-	**	**	**	**	-
B	153	N498 E997	3	99.15-99.05	**	**	**	**	-

TABLE 16. (continued)

Area	Specimen No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
				GROUP 4, FORM 4 (continued)					
B	154	N498 E997	3	99.15-99.05	**	**	**	**	-
B	155	N499 E997	2	99.25-99.15	**	**	**	**	-
-	-	N499 E998	3	99.15-99.05	**	**	**	**	-
				GROUP 6					
-	2	Surface	-	-	7.2	6.7	1.1	63.9	21
				GROUP 9					
A	-	N490 E1043	10	97.85-97.75	**	**	**	**	-
A	-	N490 E1044	12	97.65-97.55	**	**	**	**	-
B	-	N497 E996	3	99.15-99.05	**	**	**	**	-
B	-	N497 E996	11	98.35-98.25	**	**	**	**	-
B	-	N497 E997	18	97.65-97.55	**	**	**	**	-
B	-	N499 E996	18	97.65-97.55	**	**	**	**	-
B	-	N498 E997	3	99.15-99.05	**	**	**	**	-
B	-	N498 E998	3	99.15-99.05	**	**	**	**	-
B	-	N498 E998	3	99.15-99.05	**	**	**	**	-
B	-	N498 E998	13	98.15-98.05	**	**	**	**	-
B	-	N499 E997	3	99.15-99.05	**	**	**	**	-
B	-	N499 E997	3	99.15-99.05	**	**	**	**	-
B	-	N500 E996	11	98.35-98.25	**	**	**	**	-
C	-	N510 E1020	6	98.95-98.90	**	**	**	**	-
-	-	Surface	-	-	**	**	**	**	-
				GROUP 10					
B	-	N497 E998	18	97.65-97.55	**	**	**	**	-
B	-	N498 E997	11	98.35-98.25	**	**	**	**	-
B	-	N498 E998	2	99.25-99.15	**	**	**	**	-
B	-	N499 E997	2	99.25-99.15	**	**	**	**	-
B	-	N499 E997	3	99.15-99.05	**	**	**	**	-
B	-	N499 E997	4	99.05-98.95	**	**	**	**	-
B	-	N498 E997	4	99.05-98.95	**	**	**	**	-
B	-	N499 E997	4	99.05-98.95	**	**	**	**	-
B	-	N499 E997	18	97.65-97.55	**	**	**	**	-
B	-	N500 E996	11	98.35-98.25	**	**	**	**	-

TABLE 16. (continued)

Area	Specimen No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
				GROUP 10 (continued)					
B	-	N500 E997	3	99.15-99.05	**	**	**	**	-
B	-	N500 E997	19	97.55-97.45	**	**	**	**	-
B	-	N500 E998	3	99.15-99.05	**	**	**	**	-
B	-	Surface	-	-	**	**	**	**	-
B	-	N497 E996	3	99.15-99.05	**	**	**	**	-
B	-	N500 E997	2	99.25-99.15	**	**	**	**	-
B	-	N498 E997	3	99.15-99.05	**	**	**	**	-

* Weights or measurements of incomplete specimens.

** Weights of measurements not taken.

† This specimen is two fragments pieced together.

TABLE 17. PROVENIENCE AND METRIC DATA FOR DISTALLY BEVELED TOOLS--PHASE II

Area	Specimen Number	Lot	Unit	Level	Elevation	Length	Width	Thickness	Blade Width	Blade Angle	Weight	Figure
					GROUP 3, FORM 2							
B	3	371	N500 E998	13	98.15-98.05	3.7	4.8	1.0	1.1	63°-70°	19.6	22
					GROUP 3, FORM 3							
A	1	184	N491 E1043	11	97.75-97.65	3.0	3.2	0.8	0.8	80°-86°	9.0	22
					GROUP 4							
B	4	323	N497 E997	13	98.15-98.05	6.7	3.8	1.3	1.5	63°-82°	37.3	22
B	5	331	N498 E996	11	98.35-98.25	4.4	3.7	1.1	0.9	70°-83°	17.2	22
					GROUP 7, FORM 1							
B	1	271	N499 E997	3	99.15-99.05	5.8	4.2	1.7	2.0	52°-64°	43.4	22
					GROUP 9							
B	3	227	N497 E997	10	98.45-98.35	*	3.9	1.7	1.5	79°-83°	*	22
B	4	402	N498 E998	16	97.85-97.75	*	*	*	1.0	65°-76°	*	22

* Weights or measurements not taken.

TABLE 18. PROVENIENCE AND DESCRIPTIVE DATA FOR MODIFIED AND TRIMMED FLAKES--PHASE II

Area	Lot	Unit	Level	Elevation	Description
A	390	N490 E1043	16	97.25-97.15	Modified, unilaterally
A	159	N490 E1044	2	98.65-98.55	Modified, bilaterally
A	160	N490 E1044	3	98.55-98.45	Modified, bilaterally
A	164	N490 E1044	7	98.15-98.05	Modified, bilaterally
A	168	N490 E1044	11	97.75-97.65	Trimmed, alternately bilaterally
A	481	N491 E1043	19	96.95-96.85	Trimmed, end opposite platform
B	213	N497 E996	3	99.15-99.05	Trimmed, bilaterally
B	220	N497 E997	2	99.25-99.15	Trimmed, end opposite platform*
B	220	N497 E997	2	99.25-99.15	Modified, unilaterally
B	223	N497 E997	5	98.95-98.85	Modified, unilaterally
B	395	N497 E997	16	97.85-97.75	Modified, unilaterally
B	337	N497 E998	14	98.05-97.95	Trimmed, unilaterally
B	239	N498 E996	2	99.25-99.15	Trimmed, end opposite platform
B	239	N498 E996	2	99.25-99.15	Trimmed, unilaterally
B	240	N498 E996	3	99.15-99.05	Modified, unilaterally
B	240	N498 E996	3	99.15-99.05	Trimmed, bilaterally
B	241	N498 E996	4	99.05-98.95	Trimmed, unilaterally
B	241	N498 E996	4	99.05-98.95	Modified, end opposite platform
B	243	N498 E996	6	98.85-98.75	Trimmed, end opposite platform
B	333	N498 E996	13	98.15-98.05	Modified, unilaterally
B	376	N498 E996	15	97.95-97.85	Modified, bilaterally
B	246	N498 E997	2	99.25-99.15	Modified, unilaterally
B	254	N498 E998	2	99.25-99.15	Trimmed, end opposite platform*
B	254	N498 E998	2	99.25-99.15	Trimmed, end opposite platform*
B	263	N499 E996	2	99.25-99.15	Modified, unilaterally
B	264	N499 E996	3	99.15-99.05	Trimmed, unilaterally
B	271	N499 E997	3	99.15-99.05	Trimmed, unilaterally
B	271	N499 E997	3	99.15-99.05	Trimmed, unilaterally
B	271	N499 E997	3	99.15-99.05	Modified, bilaterally
B	271	N499 E997	3	99.15-99.05	Trimmed, unilaterally
B	271	N499 E997	3	99.15-99.05	Trimmed, bilaterally
B	273	N499 E997	5	98.95-98.85	Modified, unilaterally
B	447	N499 E997	17	97.75-97.65	Trimmed, unilaterally
B	448	N499 E997	18	97.65-97.55	Trimmed, unilaterally
B	278	N499 E998	3	99.15-99.05	Trimmed, bilaterally**
B	288	N500 E996	3	99.15-99.05	Modified, end opposite platform
B	359	N500 E996	13	98.15-98.05	Modified, unilaterally
B	359	N500 E996	13	98.15-98.05	Trimmed, end opposite platform
B	359	N500 E996	13	98.15-98.05	Modified, unilaterally
B	384	N500 E996	15	97.95-97.85	Trimmed, unilaterally
B	384	N500 E996	15	97.95-97.85	Trimmed, unilaterally
B	417	N500 E996	19	98.55-97.45	Modified, unilaterally
B	294	N500 E997	3	99.15-99.05	Trimmed, bilaterally
B	295	N500 E997	4	99.05-98.95	Trimmed, bilaterally

TABLE 18. (continued)

Area	Lot	Unit	Level	Elevation	Description
B	432	N500 E997	24	97.05-96.95	Trimmed, unilaterally
B	300	N500 E998	3	99.15-99.05	Trimmed, end opposite platform*
B	300	N500 E998	3	99.15-99.05	Trimmed, end opposite platform*
B	300	N500 E998	3	99.15-99.05	Modified, end opposite platform
B	300	N500 E998	3	99.15-99.05	Modified, end opposite platform
B	300	N500 E998	3	99.15-99.05	Modified, unilaterally
B	300	N500 E998	3	99.15-99.05	Modified, unilaterally
B	301	N500 E998	4	99.05-98.95	Modified, unilaterally
B	368	N500 E998	10	98.45-98.35	Modified, unilaterally
B	371	N500 E998	13	98.45-98.35	Trimmed, end opposite platform
B	434	N500 E998	17	97.75-97.65	Trimmed, unilaterally
B	436	N500 E998	19	97.45-97.35	Trimmed, unilaterally
C	457	N510 E1020	2	99.15-99.10	Modified, unilaterally
C	458	N510 E1020	3	99.10-99.05	Trimmed, end opposite platform
C	458	N510 E1020	3	99.10-99.05	Trimmed, end opposite platform
C	460	N510 E1020	5	99.00-98.95	Trimmed, end opposite platform
-	489-0	Surface and upper 20 cm of trench dug for water screens			Modified, unilaterally
-	491-0	Water screen area		-	Modified, bilaterally
-	491-0	Water screen area		-	Modified, bilaterally
-	491-0	Water screen area		-	Modified, bilaterally
-	491-0	Water screen area		-	Modified, bilaterally
-	491-0	Water screen area		-	Modified, unilaterally
-	491-0	Water screen area		-	Modified, unilaterally
-	491-0	Water screen area		-	Modified, unilaterally
-	491-0	Water screen area		-	Trimmed, unilaterally
-	491-0	Water screen area		-	Trimmed, unilaterally
-	491-0	Water screen area		-	Trimmed, end opposite platform
-	491-0	Water screen area		-	Trimmed, end opposite platform
-	491-0	Water screen area		-	Trimmed, end opposite platform*
-	491-0	Water screen area		-	Trimmed, end opposite platform*

* End scraper

** Trimmed blade

TABLE 19. PROVENIENCE OF GROUND STONE ARTIFACTS--PHASE II

AREA	LOT	UNIT	LEVEL	ELEVATION
MODIFIED SANDSTONE--GROUP 1, FORM 2				
B	271	N499 E997	3	99.15-99.05
A	313	N490-491 E1043	13	97.55-97.45*
MODIFIED SANDSTONE--GROUP 1, FORM 3				
A	172	N491 E1042	2	98.65-98.55
B	230	N497 E998	3	99.15-99.05
B	264	N499 E996	3	99.15-99.05
B	273	N499 E997	5	98.95-98.85
B	286	N500 E996	1	Surf.-99.25
B	316	N497 E996	10	98.45-98.35
B	323	N497 E997	13	98.15-98.05
B	333	N498 E996	13	98.15-98.05
B	333	N498 E996	13	98.15-98.05
B	375	N498 E996	14	98.05-97.95
B	380	N499 E996	15	97.95-97.85
B	384	N500 E996	15	97.95-97.85
B	384	N500 E996	15	97.95-97.85
C	466	N510 E1021	3	99.10-99.05
B	507	N499 E997	15	97.95-97.85
B	507	N499 E997	15	97.95-97.85
-	491-0	Surface	-	-
-	491-0	Surface	-	-
MODIFIED SANDSTONE--GROUP 2, FORM 1				
B	252	N498 E997	10	98.45-98.35
A	313	N490-491 E1043	15	97.55-97.45*
B	347	N499 E997	10	98.45-98.35
C	460	N510 E1020	5	99.00-98.95
C	461	N510 E1020	6	98.95-98.90

AREA	LOT	UNIT	LEVEL	ELEVATION
MODIFIED SANDSTONE--GROUP 2, FORM 2				
A	198	N491 E1044	10	97.85-97.75
B	290	N500 E996	5	98.95-98.85
MODIFIED SANDSTONE--GROUP 2, FORM 3				
A	193	N491 E1044	5	98.35-98.25
B	290	N500 E996	5	98.95-98.85
B	323	N497 E997	13	98.15-98.05
B	375	N498 E996	14	98.05-97.95
MODIFIED SANDSTONE--GROUP 3				
A	204	N492 E1042	3	98.55-98.45
A	313	N490-491 E1043	13	97.55-97.45*
B	273	N499 E997	5	98.95-98.85
B	233	N497 E998	6	98.85-98.75
MODIFIED QUARTZITE				
-	491-0	Surface	-	-
SATIN SPAR GYPSUM				
A	-	N491 E1044	20	-

* Feature 5

TABLE 20. PROVENIENCE OF MARINE SHELL AND MUSSEL SHELL--PHASE II

Description	Area	Lot	Unit	Level	Elevation	Figure
MARINE SHELL						
Gastropod Bead	B	384	N500 E996	15	97.95-97.85	23,e
Perforated Bivalve	B	271	N499 E997	3	99.15-99.05	23,f
Bivalve Fragment	B	271	N499 E997	3	99.15-99.05	-
Perforated Bivalve	B	255	N498 E998	3	99.15-99.05	23,g
Bivalve Fragment	B	255	N498 E998	3	99.15-99.05	-
Coral	B	364	N500 E997	13	98.15-98.05	-
MUSSEL SHELL						
Perforated Mussel Shell	A	179	N491 E1043	6	98.25-98.15	23,h
Perforated Mussel Shell	B	305	N500 E998	6	98.85-98.75	23,i
Cut/Smoothed	B	271	N499 E997	3	99.15-99.05	23,j
Cut/Smoothed	B	237	N497 E998	10	98.45-98.35	23,k

TABLE 21. PROVENIENCE AND METRIC DATA OF BONE ARTIFACTS--PHASE II

Description	Area	Lot	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
Bead	B	222	N497 E997	4	99.05-98.95	0.6	0.6	0.6	0.2	23,l
Bead	A	155	N490 E1043	11	97.75-97.65	0.8	0.3	0.3	0.1	23,m
Awl	-	489	(Water Screen Area)	-	-	5.5	1.7	0.5	2.9	23,n
Billet	-	489	(Water Screen Area)	-	-	10.1	2.4	2.4	38.4	23,o

TABLE 22. DISTRIBUTION OF CERAMIC SHERDS--PHASE II

Number of Sherds	Type of Sherd	Area	Lot	Unit	Level	Elevation
			GROUP 2			
1	Rim	C	460	N510 E1020	5	99.00-98.95
4	Body	-	489	Surf.-20 cm*	-	-
4	Neck	-	491	*	-	-
1	Rim	-	491	*	-	-
			GROUP 3A			
2	Body	B	300	N500 E998	3	99.15-99.05
			GROUP 3B			
1	Body	C	465	N510 E1021	2	99.15-99.10
			GROUP 8			
3	Body	-	489	Surf.-20 cm*	-	-
3	Body	-	491	*	-	-
			MISCELLANEOUS			
4	Body	A	144	N490 E1042	3	98.55-98.45
1	Body	A	207	N492 E1043	3	98.55-98.45
1	Body	B	213	N497 E996	3	99.15-99.05
1	Rim	B	221	N497 E997	3	99.15-99.05
2	Body	B	222	N497 E997	4	99.05-98.95
1	Body	B	278	N499 E998	3	99.15-99.05
1	Body	B	293	N500 E997	2	99.25-99.15
1	Body	B	303	N500 E998	5	98.95-98.85
2	Body	C	458	N510 E1020	3	99.10-99.05
3	Body	-	491	*	-	-

* Water Screen Area

APPENDIX III.
ARTIFACT PROVENIENCE AND METRIC DATA, UTSA FIELD SCHOOL EXCAVATIONS

TABLE 23. PROVENIENCE AND METRIC DATA FOR CORES--UTSA FIELD SCHOOL EXCAVATIONS

Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
			GROUP 1					
707	N504 E1008	2	99.20-99.10	4.7	4.5	4.4	146	-
733	N504 E1014	2	99.20-99.10	6.3	4.1	2.7	80	-
681	N505 E1008	1	99.32-99.20	12.0	10.0	7.3	1771	-
682	N505 E1009	1	99.32-99.20	9.3	4.7	2.5	124	-
659	N506 E1008	1	99.29-99.20	4.4	4.2	2.5	62	-
697	N507 E1008	2	99.20-99.10	11.7	8.6	5.5	645	29,a
702	N509 E1013	2	99.20-99.10	9.1	7.6	3.8	358	-
702	N509-E1013	2	99.20-99.10	12.0	8.7	4.6	556	-
			GROUP 2					
692	N506 E1013	2	99.20-99.10	11.1	8.6	6.0	778	29,b
697	N507 E1008	2	99.20-99.10	10.8	5.9	5.2	479	-
			GROUP 3					
711	N505 E1009	2	99.20-99.10	6.8	6.4	2.4	133	29,c
656	N507 E1011	1	99.30-99.20	5.7	5.3	3.0	100	-
			GROUP 5					
724	N504 E1010	1	99.31-99.20	5.5	3.4	2.4	61	-
655	N506 E1011	1	99.30-99.20	10.2	5.6	4.5	244	29,d
712	N508 E1010	3	99.00-98.90	6.0	5.4	4.0	100	-
718	N509 E1008	2	99.10-99.00	6.8	6.6	2.5	107	-
702	N509 E1013	2	99.20-99.10	9.4	8.3	7.3	690	-
701	N509 E1012	2	99.20-99.10	8.0	6.0	2.8	137	-
			GROUP 6					
724	N504 E1010	1	99.31-99.20	5.2	4.7	3.4	100	-
696	N506 E1009	2	99.20-99.10	5.9	4.9	2.9	69	-
696	N506 E1009	2	99.20-99.10	3.8	3.0	2.7	43	-
656	N507 E1011	1	99.30-99.20	4.0	3.4	2.6	40	-
671	N507 E1012	1	99.31-99.20	5.7	2.9	2.2	32	-

TABLE 23. (continued)

Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
			GROUP 9					
678	N504 E1008	1	99.32-99.20	**	**	**	**	-
707	N504 E1008	2	99.20-99.10	**	**	**	**	-
680	N504 E1009	1	99.32-99.20	**	**	**	**	-
680	N504 E1009	1	99.32-99.20	**	**	**	**	-
681	N505 E1008	1	99.32-99.20	**	**	**	**	-
682	N505 E1009	1	99.32-99.20	**	**	**	**	-
654	N506 E1010	1	99.30-99.20	**	**	**	**	-
692	N506 E1013	2	99.20-99.10	**	**	**	**	-
694	N507 E1013	2	99.20-99.10	**	**	**	**	-
729	N508 E1007	1	99.20-99.10	**	**	**	**	-
675	N508 E1012	1	99.30-99.20	**	**	**	**	-
699	N508 E1012	2	99.20-99.10	**	**	**	**	-
699	N508 E1012	2	99.20-99.10	**	**	**	**	-
700	N508 E1013	2	99.20-99.10	**	**	**	**	-
700	N508 E1013	2	99.20-99.10	**	**	**	**	-
730	N509 E1007	1	99.08-99.00	**	**	**	**	-
686	N509 E1009	1	99.17-99.10	**	**	**	**	-
701	N509 E1012	2	99.20-99.10	**	**	**	**	-
701	N509 E1012	2	99.20-99.10	**	**	**	**	-

** Weights or measurements not taken.

TABLE 24. PROVENIENCE AND METRIC DATA FOR THICK BIFACES--UTSA FIELD SCHOOL EXCAVATIONS

Form	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight
				GROUP 7				
1	733	N504 E1014	2	99.20-99.10	5.6*	4.5*	1.4	**
1	655	N506 E1011	1	99.30-99.20	3.6*	5.2*	1.5*	**
				GROUP 8				
-	721	N504 E1013	2	99.10-99.00	5.0*	4.1*	1.3	**
-	653	N509 E1011	1	99.23-99.10	3.8*	4.4*	1.7	**
-	702	N509 E1013	2	99.20-99.10	9.0*	4.9*	1.5	**

* Weights or measurements of incomplete specimens.
** Weights or measurements not taken.

TABLE 25. PROVENIENCE AND METRIC DATA FOR STEMMED THIN BIFACES--UTSA FIELD SCHOOL EXCAVATIONS

Specimen Number	Type	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
					GROUP 1, FORM 4								
16	**Perdiz**	654	N506 E1010	1	99.30-99.20 m	1.7*	1.4	0.2	0.6	0.5	0.5	0.5*	30
17	**Perdiz**	657	N507 E1010	1	99.30-99.20 m	3.0	1.6	0.3	1.0	0.7	0.7	1.2	30
18	**Perdiz**	659	N506 E1008	1	99.29-99.20 m	2.5	1.4	0.2	0.6	0.5	0.5	0.6	30
19	**Perdiz**	696	N506 E1009	2	99.20-99.10 m	1.6*	1.2*	0.2	0.5	0.4	0.4	0.5*	30
20	**Perdiz**	699	N508 E1012	2	99.20-99.10 m	1.6*	1.6	0.3	0.6	0.5	0.5	0.8*	30
21	**Perdiz**	700	N508 E1013	2	99.20-99.10 m	2.1	1.6	0.2	0.7	0.6	0.6	0.6	30
22	**Perdiz**	702	N509 E1013	2	99.20-99.10 m	2.3	1.5	0.3	1.0	0.4	0.4	0.7	30
23	**Perdiz**	707	N504 E1008	2	99.20-99.10 m	2.2	1.1*	0.3	0.9	0.4	0.4	0.7*	30
24	**Perdiz**	707	N504 E1008	2	99.20-99.10 m	2.6	1.4	0.2	0.8	0.5	0.5	0.5	30
25	**Perdiz**	720	N504 E1012	2	99.20-99.10 m	1.4	1.3	0.2	0.6	0.4	0.4	0.5	30
26	**Perdiz**	720	N504 E1012	2	99.20-99.10 m	2.0*	1.3	0.3	0.7	0.5	0.5	0.8*	30
28	**Perdiz**	723	N505 E1013	2	99.20-99.10 m	**	**	**	**	**	**	**	39
†29	**Perdiz**	[722 [665	N505 E1012 N505 E1012	2 1	99.20-99.10 m] 99.28-99.20 m]	2.1*	1.6	0.2	0.9	0.5	0.5	0.8*	-
62	**Perdiz**	652	N509 E1010	1	99.23-99.10 m	1.9	1.2	0.2	0.6	0.5	0.5	0.5	30
63	**Perdiz**	669	N506 E1012	1	99.31-99.20 m	3.2*	1.3	0.2	0.7	0.5	0.5	0.9	30
64	**Perdiz**	696	N506 E1009	2	99.20-99.10 m	2.3	1.2	0.2	0.6	0.5	0.5	0.6	30
65	**Perdiz**	699	N508 E1012	2	99.20-99.10 m	2.5	1.6*	0.2	0.6	0.6	0.6	1.0	30
66	**Perdiz**	701	N509 E1012	2	99.20-99.10 m	1.0*	0.8	0.2	0.5*	0.5	0.5	0.3*	30
67	**Perdiz**	679	N504 E1008	1	99.32-99.20 m	1.8*	1.4*	0.2	0.8	0.6	0.6	0.6*	30
68	**Cliffton**	700	N508 E1013	2	99.20-99.10 m	2.1*	1.8	0.4	0.6	0.9	0.9	1.7*	30
69	**Cliffton**	701	N509 E1012	2	99.20-99.10 m	1.8*	1.5	0.3	0.4	0.6	0.6	0.9*	30
70	**Cliffton**	703	N506 E1010	2	99.20-00.10 m	3.4*	1.1*	0.2	0.6	0.5	0.5	1.1*	-

TABLE 25. (continued)

Specimen Number	Type	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
					GROUP 1, FORM 5								
3	-	680	N504 E1009	1	99.32-99.20 m	1.6*	1.2	0.2	0.4	0.4	0.4	0.4*	30
4	-	670	N506 E1013	1	99.31-99.20 m	2.3*	1.3	0.2	0.5	0.4	0.4	0.6*	30
15	-	721	N504 E1013	2	99.10-99.00 m	2.9*	1.4	0.5	1.2	0.5	0.5	1.9*	30
31	-	697	N507 E1008	2	99.20-99.10 m	**	**	**	**	**	**	**	30
					GROUP 1, FORM 6								
2	-	727	N505 E1011	1	99.31-99.20 m	4.7*	3.2*	0.6	1.3	1.6	1.6	9.4*	31
					GROUP 1, FORM 7								
15	-	653	N509 E1011	1	99.23-99.20 m	**	**	**	**	**	**	**	-
16	-	699	N508 E1012	2	99.20-99.10 m	**	**	**	**	**	**	**	30
17	-	698	N507 E1009	2	99.20-99.10 m	**	**	**	**	**	**	**	-
18	-	719	N508 E1008	2	99.10-99.00 m	**	**	**	**	**	**	**	30
19	-	719	N508 E1008	2	99.10-99.00 m	**	**	**	**	**	**	**	30
20	-	720	N504 E1012	2	99.20-99.10 m	**	**	**	**	**	**	**	-
21	-	723	N505 E1013	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	707	N504 E1008	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	730	N509 E1007	1	99.08-99.00 m	**	**	**	**	**	**	**	-
-	-	673	N507 E1013	1	99.31-99.20 m	**	**	**	**	**	**	**	-
-	-	682	N505 E1009	1	99.32-99.20 m	**	**	**	**	**	**	**	-
-	-	700	N508 E1013	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	700	N508 E1013	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	679	N504 E1008	1	99.32-99.20 m	**	**	**	**	**	**	**	-
-	-	679	N504 E1008	1	99.32-99.20 m	**	**	**	**	**	**	**	-
-	-	697	N507 E1008	2	99.20-99.10 m	**	**	**	**	**	**	**	-

TABLE 25. (continued)

Specimen Number	Type	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Stem Length	Stem Width	Neck Width	Weight	Figure
GROUP 1, FORM 7 (continued)													
-	-	729	N508 E1007	1	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	729	N508 E1007	1	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	729	N508 E1007	1	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	671	N507 E1012	1	99.31-99.20 m	**	**	**	**	**	**	**	-
-	-	722	N505 E1012	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	722	N505 E1012	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	674	N509 E1014		(Surface)	**	**	**	**	**	**	**	-
-	-	726	N505 E1010	1	99.31-99.20 m	**	**	**	**	**	**	**	-
-	-	685	N509 E1008	1	99.17-99.10 m	**	**	**	**	**	**	**	-
-	-	662	N507 E1009	1	99.29-99.20 m	**	**	**	**	**	**	**	-
-	-	662	N507 E1009	1	99.29-99.20 m	**	**	**	**	**	**	**	-
-	-	657	N507 E1010	1	99.30-99.20 m	**	**	**	**	**	**	**	-
-	-	663	N504 E1012	1	99.28-99.20 m	**	**	**	**	**	**	**	-
-	-	684	N508 E1009	1	99.17-99.10 m	**	**	**	**	**	**	**	-
-	-	709	N505 E1008	2	99.20-99.10 m	**	**	**	**	**	**	**	-
-	-	736	N505 E1011	2	99.20-99.10 m	**	**	**	**	**	**	**	-

* Weights or measurements of incomplete specimens.

** Weights or measurements not taken.

† This specimen is two fragments pieced together.

TABLE 26. PROVENIENCE AND METRIC DATA FOR UNSTEMMED THIN BIFACES--UTSA FIELD SCHOOL EXCAVATIONS

Form	Specimen No.	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
					GROUP 2					
2	9	696	N506 E1009	2	99.20-99.10 m	8.0*	3.5	0.9	**	31
					GROUP 3					
2	6	724	N504 E1010	1	99.31-99.20 m	7.8*	3.5	0.7	**	31
					GROUP 4					
2	1	653	N509 E1011	1	99.23-99.10 m	**	**	**	**	31
2	4	673	N507 E1013	1	99.31-99.20 m	5.2*	3.8*	0.9	**	31
2	5	694	N507 E1013	2	99.20-99.10 m	6.0*	3.2	0.8	**	31
2	6	651	N508 E1011	1	99.23-99.10 m	8.9	3.6	0.6	26.5	31
2	7	656	N507 E1011	1	99.30-99.20 m	4.3*	3.6	0.8	**	31
2	†8	[680 [682	N504 E1009 N505 E1009	1 1	99.32-99.20 m] 99.32-99.20 m]	7.2	3.6	0.6	15.8	32
2	9	689	N509 E1010	2	99.10-99.00 m	5.7	4.2	0.7	18.7	32
2	10	696	N506 E1009	2	99.20-99.10 m	4.1*	4.9	0.7	**	32
2	11	699	N508 E1012	2	99.20-99.10 m	8.5	4.4	0.7	25.5	32
2	12	701	N509 E1012	2	99.20-99.10 m	9.3	2.7	0.6	18.7	32
2	13	706	N507 E1011	2	99.20-99.10 m	**	**	**	**	-
2	14	729	N508 E1007	1	99.20-99.10 m	8.4	4.0	0.8	22.5	32
3	13	659	N506 E1008	1	99.29-99.20 m	1.5*	2.2	0.6	1.6*	33
3	14	692	N506 E1013	2	99.20-99.10 m	3.3	2.3	0.4	3.8	33

TABLE 26. (continued)

Form	Specimen No.	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
					GROUP 4 (continued					
3	15	700	N508 E1013	2	99.20-99.10 m	5.6	2.9	0.7	13.9	33
3	16	721	N504 E1013	2	99.10-99.00 m	2.8*	1.6	0.5	1.6*	33
3	17	734	N505 E1014	2	99.20-99.10 m	2.5	1.8	0.4	1.6	33
4	30	699	N508 E1012	2	99.20-99.10 m	**	**	**	**	33
4	31	706	N507 E1011	2	99.20-99.10 m	**	**	**	**	-
4	32	724	N504 E1010	1	99.31-99.20 m	**	**	**	**	-
4	33	733	N504 E1014	2	99.20-99.10 m	**	**	**	**	-
4	156	700	N508 E1013	2	99.20-99.10 m	2.1*	1.6	0.2	0.9*	33
4	157	707	N504 E1008	2	99.20-99.10 m	**	**	**	**	33
4	158	702	N509 E1013	2	99.20-99.10 m	1.7*	1.3	0.2	0.7*	33
4	†159	[716 [684	N509 E1009 N508 E1009	2 1	99.10-99.00 m] 99.17-99.10 m]	**	**	**	**	33
					GROUP 7					
-	1	659	N506 E1008	1	99.29-99.20 m	2.7	0.8	0.4	0.8	33
					GROUP 8					
-	1	660	N506 E1009	1	99.29-99.20 m	3.5*	1.6	0.3	0.9*	33
-	2	683	N508 E1008	1	99.17-99.10 m	5.0	2.6	0.5	3.4	33
-	3	696	N506 E1009	2	99.20-99.10 m	5.0*	2.2	0.7	4.1*	33
-	4	697	N507 E1008	2	99.20-99.10 m	5.9	1.8	0.5	4.4	33

TABLE 26. (continued)

Form	Specimen No.	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
					GROUP 9					
-	-	699	N508 E1012	2	99.20-99.10 m	**	**	**	**	-
-	-	718	N509 E1008	2	99.10-99.00 m	**	**	**	**	-
-	-	700	N508 E1013	2	99.20-99.10 m	**	**	**	**	-
-	-	700	N508 E1013	2	99.20-99.10 m	**	**	**	**	-
-	-	650	N508 E1010	1	99.23-99.10 m	**	**	**	**	-
-	-	709	N505 E1008	2	99.20-99.10 m	**	**	**	**	-
-	-	663	N504 E1012	1	99.28-99.20 m	**	**	**	**	-
					GROUP 10					
-	-	730	N509 E1007	1	99.08-99.00 m	**	**	**	**	-
-	-	730	N509 E1007	1	99.08-99.00 m	**	**	**	**	-
-	-	723	N505 E1013	2	99.20-99.10 m	**	**	**	**	-
-	-	719	N508 E1008	2	99.10-99.00 m	**	**	**	**	-
-	-	675	N508 E1012	1	99.29-99.20 m	**	**	**	**	-
-	-	701	N509 E1012	2	99.20-99.10 m	**	**	**	**	-
-	-	693	N507 E1012	2	99.20-99.10 m	**	**	**	**	-
-	-	694	N507 E1013	2	99.20-99.10 m	**	**	**	**	-
-	-	692	N506 E1013	2	99.20-99.10 m	**	**	**	**	-
-	-	656	N507 E1011	1	99.30-99.20 m	**	**	**	**	-
-	-	663	N504 E1012	1	99.28-99.20 m	**	**	**	**	-
-	-	699	N508 E1012	2	99.20-99.10 m	**	**	**	**	-

* Weights or measurements of incomplete specimens.
** Weights or measurements not taken.
† This specimen is two fragments pieced together.

TABLE 27. PROVENIENCE AND DESCRIPTIVE DATA, MODIFIED AND TRIMMED FLAKES--UTSA FIELD SCHOOL EXCAVATIONS

Lot No.	Unit	Level	Elevation	Description
650	N508 E1010	1	99.23-99.10 m	Modified, unilaterally
650	N508 E1010	1	99.23-99.10 m	Modified, unilaterally
†650	N508 E1010	1	99.23-99.10 m	*Trimmed, end opposite platform
650	N508 E1010	1	99.23-99.10 m	Modified, unilaterally
650	N508 E1010	1	99.23-99.10 m	Trimmed, bilaterally; modified unilaterally
650	N508 E1010	1	99.23-99.10 m	Trimmed, unilaterally, end opposite platform
654	N506 E1010	1	99.30-99.20 m	Trimmed, unilaterally, end opposite platform
†655	N506 E1011	1	99.30-99.20 m	*Trimmed, unilaterally, end opposite platform
660	N506 E1009	1	99.29-99.20 m	Modified, bilaterally; trimmed end opposite platform
663	N504 E1012	1	99.28-99.20 m	Trimmed, unilaterally, end opposite platform
669	N506 E1012	1	99.31-99.20 m	Trimmed, unilaterally
669	N506 E1012	1	99.31-99.20 m	Trimmed, bilaterally
669	N506 E1012	1	99.31-99.20 m	Modified, bilaterally
669	N506 E1012	1	99.31-99.20 m	Modified, unilaterally
670	N506 E1013	1	99.31-99.20 m	Modified, unilaterally
670	N506 E1013	1	99.31-99.20 m	Trimmed, unilaterally
679	N504 E1008	1	99.32-99.20 m	Trimmed, end opposite platform
†679	N504 E1008	1	99.32-99.20 m	*Trimmed, end opposite platform
680	N504 E1009	1	99.32-99.20 m	Modified, bilaterally
681	N505 E1008	1	99.32-99.20 m	Trimmed, unilaterally
681	N505 E1008	1	99.32-99.20 m	Trimmed, platform end
681	N505 E1008	1	99.32-99.20 m	Trimmed, end opposite platform
682	N505 E1009	1	99.32-99.20 m	Modified, unilaterally
683	N508 E1008	1	99.17-99.10 m	Modified, unilaterally
683	N508 E1008	1	99.17-99.10 m	Trimmed, unilaterally

TABLE 27. (continued)

Lot No.	Unit	Level	Elevation	Description
684	N508 E1009	1	99.17-99.10 m	Trimmed, unilaterally
684	N508 E1009	1	99.17-99.10 m	Modified, unilaterally, end opposite platform
684	N508 E1009	1	99.17-99.10 m	Trimmed, unilaterally
684	N508 E1009	1	99.17-99.10 m	*Trimmed, unilaterally
685	N509 E1008	1	99.17-99.10 m	Modified, unilaterally
685	N509 E1008	1	99.17-99.10 m	Modified, unilaterally
687	N508 E1010	2	99.10-99.00 m	Modified, unilaterally
688	N508 E1011	2	99.10-99.00 m	Modified, end opposite platform
688	N508 E1011	2	99.10-99.00 m	Trimmed, unilaterally
691	N506 E1012	2	99.20-99.10 m	Trimmed, unilaterally, end opposite platform
691	N506 E1012	2	99.20-99.10 m	Trimmed, unilaterally
692	N507 E1008	2	99.20-99.10 m	Modified, unilaterally
693	N507 E1012	2	99.20-99.10 m	Trimmed, unilaterally
693	N507 E1012	2	99.20-99.10 m	Modified, bilaterally
693	N507 E1012	2	99.20-99.10 m	Modified, bilaterally
693	N507 E1012	2	99.20-99.10 m	Modified, bilaterally
693	N507 E1012	2	99.20-99.10 m	Modified, unilaterally
697	N507 E1008	2	99.20-99.10 m	Modified, unilaterally
697	N507 E1008	2	99.20-99.10 m	Trimmed, unilaterally
697	N507 E1008	2	99.20-99.10 m	Trimmed, unilaterally
†698	N507 E1009	2	99.20-99.10 m	*Trimmed, end opposite platform
699	N508 E1012	2	99.20-99.10 m	Modified, unilaterally
699	N508 E1012	2	99.20-99.10 m	Trimmed, alternate lateral edges
†700	N508 E1013	2	99.20-99.10 m	*Trimmed, end opposite platform
700	N508 E1013	2	99.20-99.10 m	Modified, bilaterally, end opposite platform
700	N508 E1013	2	99.20-99.10 m	Modified, bilaterally
700	N508 E1013	2	99.20-99.10 m	Trimmed, unilaterally
700	N508 E1013	2	99.20-99.10 m	Trimmed, unilaterally
700	N508 E1013	2	99.20-99.10 m	Modified, unilaterally

TABLE 27. (continued)

Lot No.	Unit	Level	Elevation	Description
†701	N509 E1012	2	99.20-99.10 m	*Trimmed, end opposite platform
702	N509 E1013	2	99.20-99.10 m	Trimmed, bilaterally, end opposite platform
702	N509 E1013	2	99.20-99.10 m	Modified, bilaterally
703	N506 E1010	2	99.20-99.10 m	Modified, unilaterally
706	N507 E1011	2	99.20-99.10 m	Trimmed, platform end
707	N504 E1008	2	99.20-99.10 m	Trimmed, end opposite platform
707	N504 E1008	2	99.20-99.10 m	Modified, unilaterally
708	N504 E1009	2	99.20-99.10 m	*Trimmed, end opposite platform
708	N504 E1009	2	99.20-99.10 m	Modified, unilaterally
709	N505 E1008	2	99.20-99.10 m	Trimmed, unilaterally
†709	N505 E1008	2	99.20-99.10 m	*Trimmed, end opposite platform
711	N505 E1009	2	99.20-99.10 m	Modified, unilaterally
711	N505 E1009	2	99.20-99.10 m	Modified, unilaterally
715	N509 E1011	3	99.00-98.90 m	Trimmed, unilaterally
716	N509 E1009	2	99.10-99.00 m	Modified, unilaterally
716	N509 E1009	2	99.10-99.00 m	Modified, unilaterally
718	N509 E1008	2	99.10-99.00 m	Modified, unilaterally
†720	N504 E1012	2	99.20-99.10 m	*Trimmed, end opposite platform
720	N504 E1012	2	99.20-99.10 m	Trimmed, unilaterally
720	N504 E1012	2	99.20-99.10 m	Modified, unilaterally
720	N504 E1012	2	99.20-99.10 m	Modified, unilaterally
720	N504 E1012	2	99.20-99.10 m	Trimmed, unilaterally
721	N504 E1013	2	99.10-99.00 m	Trimmed, unilaterally; modified, unilaterally
721	N504 E1013	2	99.10-99.00 m	Modified, unilaterally
†723	N505 E1013	2	99.20-99.10 m	*Trimmed, end opposite platform
724	N504 E1010	1	99.31-99.20 m	Modified, unilaterally
724	N504 E1010	1	99.31-99.20 m	Trimmed, unilaterally

TABLE 27. (continued)

Lot No.	Unit	Level	Elevation	Description
724	N504 E1010	1	99.31-99.20 m	Modified, unilaterally
725	N504 E1011	1	99.33-99.20 m	Modified, bilaterally
725	N504 E1011	1	99.33-99.20 m	Modified, unilaterally
726	N505 E1010	1	99.31-99.20 m	Modified, unilaterally
†727	N505 E1011	1	99.31-99.20 m	*Trimmed, end opposite platform
727	N505 E1011	1	99.31-99.20 m	Modified, unilaterally
727	N505 E1011	1	99.31-99.20 m	Trimmed, alternate lateral edges
729	N508 E1007	1	99.20-99.10 m	Modified, unilaterally
729	N508 E1007	1	99.20-99.10 m	Modified, unilaterally
729	N508 E1007	1	99.20-99.10 m	Modified, bilaterally
730	N509 E1007	1	99.08-99.00 m	Modified, bilaterally
†730	N509 E1007	1	99.08-99.00 m	*Trimmed, end opposite platform
†730	N509 E1007	1	99.08-99.00 m	*Trimmed, end opposite platform
734	N505 E1014	2	99.20-99.10 m	Trimmed, bilaterally
734	N505 E1014	2	99.20-99.10 m	Modified, bilaterally
735	N504 E1011	2	99.20-99.10 m	Modified, unilaterally

* Late Prehistoric diagnostic end scrapers.

† Artifact illustrated in Figure 34.

TABLE 28. PROVENIENCE OF GROUND STONE ARTIFACTS--UTSA FIELD SCHOOL EXCAVATIONS

Form	Lot No.	Unit	Level	Elevation
		GROUP 1		
2	691	N506 E1012	2	99.20-99.10
2	704	N506 E1011	2	99.20-99.10
3	664	N504 E1013	1	99.28-99.20
3	698	N507 E1009	2	99.20-99.10
3	703	N506 E1010	2	99.20-99.10
3	725	N504 E1011	1	99.33-99.20
3	729	N508 E1007	1	99.20-99.10
3	730	N509 E1007	1	99.08-99.00
		GROUP 2		
3	703	N506 E1010	2	99.20-99.10
		GROUP 3		
-	700*	N508 E1013	2	99.20-99.10
-	702*	N509 E1013	2	99.20-99.10
-	718*	N509 E1008	2	99.10-99.00

* Artifact illustrated in Figure 35.

TABLE 29. PROVENIENCE AND METRIC DATA FOR MODIFIED SHELL--UTSA FIELD SCHOOL EXCAVATIONS

Description	Lot No.	Provenience			Length	Width	Thickness	Weight	Figure
		Unit	Level	Elevation					
Shell tinkler	730	N509 E1007	1	99.08-99.00 m	1.9	**	**	**	36,b
Shell tinkler	660	N506 E1009	1	99.29-99.20 m	2.1	1.0	0.9	1.2	36,a
Bivalve fragment	734	N505 E1014	2	99.20-99.10 m	1.9*	**	**	**	36,c
Mussel shell	707	N504 E1008	2	99.20-99.10 m	3.9	1.6	0.4	4.5	36,d

* Weights or measurements of incomplete specimens.

** Weights or measurements not taken.

TABLE 30. PROVENIENCE AND METRIC DATA FOR MODIFIED BONE--UTSA FIELD SCHOOL EXCAVATIONS

Description	Lot No.	Unit	Level	Elevation	Length	Width	Thickness	Weight	Figure
Bead	651	N508 E1011	1	99.23-99.10 m	1.1	0.7	0.5	0.2	36,i
Bead	651	N508 E1011	1	99.23-99.10 m	1.2	0.7	0.5	0.3	36,j
Bead	696	N506 E1009	2	99.20-99.10 m	1.2	0.6	0.5	0.2	36,k
Bead	696	N506 E1009	2	99.20-99.10 m	1.2	0.6	0.6	0.3	36,l
Bead	691	N506 E1012	2	99.20-99.10 m	4.3	0.7	0.5	1.0	36,e
Bead	705	N507 E1010	2	99.20-99.10 m	3.8	0.6	0.5	0.8	36,b
Bead	657	N507 E1010	1	99.30-99.20 m	3.6	0.6	0.5	0.9	36,g
Bead	703	N506 E1010	2	99.20-99.10 m	3.5	0.6	0.4	0.6	36,h
Bead	684	N508 E1009	1	99.17-99.10 m	6.0*	1.1	0.9	5.6*	36,m
Awl	652	N509 E1010	1	99.23-99.10 m	11.2	**	**	6.1	36,o
Bipointed tool	735	N504 E1011	2	99.20-99.10 m	5.1	0.6	0.4	0.7	36,n
Modified Bison	699	N508 E1012	2	99.20-99.10 m	11.9	2.5*	**	33.6*	36,p
Spatulate	718	N509 E1008	2	99.10-99.00 m	14.6	2.0-2.7	0.3-0.5	18.5	36,q
Spatulate	730	N509 E1007	1	99.08-99.00 m	15.1	1.9-2.9	0.3-0.4	17.9	36,r

* Weights or measurements of incomplete specimens

** Weights or measurements not taken.

TABLE 31. PROVENIENCE OF HISTORIC ARTIFACTS--UTSA FIELD SCHOOL EXCAVATIONS

Description	Lot No.	Unit	Level	Elevation
1 Button, glass	679	N504 E1008	1	99.32-99.20 m
1 Button, metal	680	N504 E1009	1	99.32-99.20 m
1 .22 Cartridge Case 1 Metal Scrap Fragment	724	N504 E1010	1	99.31-99.20 m
1 Nail, square	663	N504 E1012	1	99.28-99.20 m
1 Metal Scrap Fragment	721	N504 E1013	2	99.10-99.00 m
1 Metal Washer 6 Metal Scrap Fragments	733	N504 E1014	2	99.20-99.10 m
1 Nail, square 2 Metal Scrap Fragments	726	N505 E1010	1	99.31-99.20 m
1 Button, metal 2 .22 Cartridge Cases 17 Metal Scrap Fragments	727	N505 E1011	1	99.31-99.20 m
2 Metal Scrap Fragments	665	N505 E1012	1	99.28-99.20 m
2 Metal Scrap Fragments	732	N505 E1014	1	99.25-99.20 m
3 Nails, square 1 Nail, round	669	N506 E1012	1	99.31-99.20 m
1 Lead Bullet Fragment	670	N506 E1013	1	99.31-99.20 m
2 Nails, square	662	N507 E1009	1	99.29-99.20 m
1 Metal Scrap Fragment	671	N507 E1012	1	99.31-99.20 m
1 Metal Garment Stud	673	N507 E1013	1	99.31-99.20 m
3 Nails, square	684	N508 E1009	1	99.17-99.10 m
1 Button, glass	676	N508 E1013	1	99.29-99.20 m
1 Nail, square	730	N509 E1007	1	99.08-99.00 m
1 Lead Bullet	718	N509 E1008	2	99.10-99.00 m
1 Nail, round	689	N509 E1010	2	99.10-99.00 m
1 Button, glass 1 Metal Screw 2 Nails, round	677	N509 E1012	1	99.29-99.20 m
1 Metal Staple	737	N512 E1008	2	-

APPENDIX IV.

RADIOCARBON ASSAYS

Wood charcoal was very well preserved throughout the levels excavated at 41 LK 201. During Phase I, a single sample was submitted to the Radiocarbon Laboratory, Balcones Research Center, The University of Texas at Austin, and a radiocarbon date of 1300 B.C. (MASCA corrected) was obtained for the lower levels (Hall, Black, and Graves 1982:652). During the Phase II investigations, a total of 62 carbon samples was collected. Four were submitted to the Radiocarbon Laboratory, Balcones Research Center, The University of Texas at Austin; the results are provided in Table 32. Ten carbon samples were collected during the UTSA Field School excavations; one sample was submitted for dating purposes (see Table 32).

TABLE 32. RADIOCARBON ASSAYS, PHASE II AND UTSA FIELD SCHOOL EXCAVATIONS

Unit(s)	Level	Elevation	Feature	Tx-No.	Age (Uncorrected)	MASCA* B.P. Date	MASCA* B.C./A.D. Date	DENDRO** B.P. Date	DENDRO** B.C./A.D. Date
PHASE II									
N497-499-500 E997-998	3	99.15-99.05 m	-	4667	360 ± 50	450-480	A.D. 1470-1500	394	A.D. 1556
N491 E1043	12	97.65-99.55 m	5	4665	2450 ± 60	2430	480 B.C.	2481-2452	502-531 B.C.
N500 E996	17	97.75-97.65 m	8	4673	2520 ± 70	2610-2670	720-660 B.C.	2540	590 B.C.
N500 E996-997	16	97.85-97.75 m	8	4672	2710 ± 60	2770-2790	840-820 B.C.	2780	830 B.C.
UTSA FIELD SCHOOL									
N507-508 E1013	2	99.20-99.10 m	-	4668	320 ± 60	360-440	A.D. 1510-1590	No correction	

* MASCA corrections after Ralph, Michael, and Han 1973.

** Dendrochronologic corrections after Damon et al. 1974.

REFERENCES CITED

Damon, P. E., C. W. Ferguson, A. Long, and E. I. Wallick

1974 Dendrochronologic Calibration of the Radiocarbon Time Scale. **American Antiquity** 39(2):350-366.

Ralph, E. K., H. N. Michael, and M. C. Han

1973 Radiocarbon Dates and Reality. **MASCA Newsletter** 9(1):1-20.

APPENDIX V.

ANALYSIS OF VERTEBRATE FAUNAL REMAINS FROM 41 LK 201, LIVE OAK COUNTY, TEXAS

D. Gentry Steele

An examination of the faunal remains from 41 LK 201 provides us with a unique opportunity to examine the human utilization of animal resources during the Archaic and Late Prehistoric periods in south Texas. The large faunal sample also provides us with the opportunity to infer past environmental conditions in south Texas based upon an examination of animals present in the region at the time.

Before we can make inferences about past human utilization of available fauna, and before we can reconstruct past environmental conditions, however, we must examine the nature of the bone assemblage itself. This is necessary because a bone assemblage present at a human habitation area represents a biased sample of faunal remains. Primarily, it represents a selection of the animals in the environment which the humans chose to use. But, the assumption that this is a human selection of the fauna, however, must be tempered. We must keep in mind that humans may not have been the only hunters and gatherers occupying the site. Domesticated dogs may have co-habited the site with the human occupants, or other predators may have occupied the immediate vicinity of the site before or after the human occupants utilized the area (Hester 1975a, 1975b, 1980; Behrensmeyer and Hill 1980; Binford 1981; Brain 1981; Shipman 1981). Any of these kinds of non-human predators could add, or delete, bones from the assemblage. In addition to human and non-human predators adding or deleting bone from the site, there is also the possibility that some of the bones represent the remains of animals which lived and subsequently died at the site, but were never used by humans.

The second major point to remember in examining a bone assemblage is that what is recovered does not reflect a random sample of what was utilized by the humans, or what was present at the site. Several phenomena can alter the structure of the assemblage which is recovered. Not all food consumed is returned to the site. Some molluscs may have been consumed away from the site. Only the soft tissue of very large animals such as bison may have been brought back to the sites, thus no trace would be left of the consumption of the bison.

In a similar vein, the bones of every animal returned to the site may not have an equal chance for preservation and recovery. Certainly, the more fragile bones of animals, and the bones of smaller animals, will usually be underrepresented in the site (Payne 1975). They may be digested in the human alimentary tract (Williams-Dean 1978; Stock 1983). They may be consumed by scavengers co-habiting the site or occupying the site at a later date (Lyon 1970; Casteel 1971). Or, they may be more subject to the physical destruction and chemical dissolution upon exposure to the forces of nature. Also, the smaller animals may be underrepresented because the recovery techniques utilized by the archaeologists were too gross to have sampled all sizes of bones (DeMarcay and Steele, this volume). Finally, some bones may

be ground into meal or temper (Campbell and Campbell 1981) or used for tools (Hester 1980), and thus are not recovered in an analyzable form. Given these caveats, the first procedure followed in the examination of the bone assemblage recovered from 41 LK 201 was to examine the structure of the assemblage itself.

STRUCTURE OF THE BONE ASSEMBLAGE

The bone sample analyzed was recovered from the 1/4-inch screen and selected fine screen samples. The sample consisted of more than 9650 individual fragments which weighed in total 3163.3 grams. All bone analyzed was identified to one of 32 genera, or nine taxa above the level of genus when a generic designation could not be made. It should be noted that the fine-screened portion of the sample which was analyzed is not included in the above bone counts and weights.

Table 33 subdivides the sample by level. Column "A" lists the level; "B" the number of squares excavated at that level; "C" the cubic meters of earth excavated at that level; "D" the number of bones recovered; "E" the total weight of bones recovered at that level; "F" the mean weight of bones from that level; "G" the average number of bones recovered per cubic meter at that level; "H" the average total weight of bones per cubic meter at that level; "I" the number of taxa recognized from that level; and "J" the average number of taxa recovered per cubic meter at that level. A quick perusal of columns "D," "E," and "I" clearly documents the loss in numbers of bones, the reduction in the total weight of bones, and the reduction in the number of taxa recovered in the successively deeper and older levels.

A series of causes can be postulated to explain this decrease in the amount of bone through time. There could have been a gradual reduction in the area excavated as one digs deeper into the site. The rate of soil deposition could have varied through time with more soil having been deposited during earlier times. The site may not have been used as often through time, or by as many people. There may have been a consistent pattern of increasing utilization of vertebrated animals through time. There may have been a continual destruction and dissolution of the bone through time, so that less bone survived the longer periods of internment. Or, the earlier occupations may have been sampled in less intensively utilized areas of the site. In fact, one would suspect that a combination of these factors could have contributed to the make-up of the sample at 41 LK 201.

Certainly, less earth was excavated in the deeper levels at 41 LK 201, (Table 33, columns B and C), and this had a significant impact upon the volume of bone and number of taxa recovered (Table 33, columns E, F, and I). Part of the reason for the disproportionately larger exposure of Late Prehistoric occupation levels was that some excavations were specifically placed to uncover a Late Prehistoric bone bed. For the lower levels, however, it was usually not possible to fully expose feature areas (Kenneth Brown, personal communication 1984). The effect of this on the bone assemblage is particularly apparent when the relationship between the volume of earth excavated and the number of taxa are directly compared (Fig. 45). The relationship between number of taxa or minimum number of individuals and

TABLE 33. DESCRIPTION OF THE BONE ASSEMBLAGE BY LEVEL FROM 41 LK 201

A	B	C	D	E	F	G	H	I	J
1	66	26.4	2570(797)	(667.5)	0.8	97.3	25.3	25	0.9
2	58	23.2	2668(725)	(851.5)	1.2	115.0	36.7	26	1.1
3	30	12.0	1443(1508)	(779.7)	0.5	120.2	64.9	22	1.1
4	20	8.0	420	135.0	0.3	52.5	16.9	13	1.4
5	20	8.0	216	89.2	0.4	27.0	11.2	11	1.4
6	20	8.0	163	43.6	0.3	20.4	5.4	10	1.2
7	20	8.0	163	110.8	0.7	20.4	13.8	12	1.5
8	20	8.0	119	64.9	0.5	14.9	8.1	8	1.0
9	16	6.4	57	55.2	1.0	8.9	8.6	6	0.9
10	16	6.4	150	26.5	0.2	23.4	4.1	8	1.2
11	16	6.4	253	39.1	0.1	39.5	6.2	9	1.4
12	16	6.4	363	44.2	0.2	56.7	6.9	6	1.0
13	16	6.4	319	47.5	0.1	49.8	7.4	9	1.4
14	16	6.4	131	35.7	0.3	20.5	5.6	5	0.8
15	16	6.4	217	61.4	0.3	33.9	9.6	6	1.0
16	16	6.4	154	67.2	0.4	24.1	10.5	7	1.1
17	16	6.4	91	18.5	0.2	14.2	2.9	2	0.3
18	16	6.4	71	15.6	0.2	11.1	2.4	4	0.6
19	7	2.8	69	9.6	0.1	24.6	3.4	2	0.7
20	4	1.6	4	0.4	0.1	2.5	0.2	1	0.6
21	3	1.2	-	-	-	-	-	-	-
22	3	1.2	-	-	-	-	-	-	-
23	3	1.2	1	0.2	0.2	0.8	0.2	1	0.8
24	3	1.2	-	-	-	-	-	-	-
25	3	1.2	1	0.2	0.2	0.8	0.2	1	0.8

Column A = level number.
Column B = number of squares excavated at that level.
Column C = volume of matrix excavated at that level.
Column D = number of bones recovered from the level (number in parentheses is the number of bones for which weight was recorded).
Column E = total weight of bone sample for the level (weight in parentheses represents the total weight for those bones which were counted and weighed from the level).
Column F = the mean weight of the bone fragments from the level.
Column G = the average number of bones recovered per cubic meter from the level.
Column H = the mean total weight per cubic meter recovered from the level.
Column I = the number of taxa recognized from that level.
Column J = the mean number of taxa recovered per cubic meter from the level.

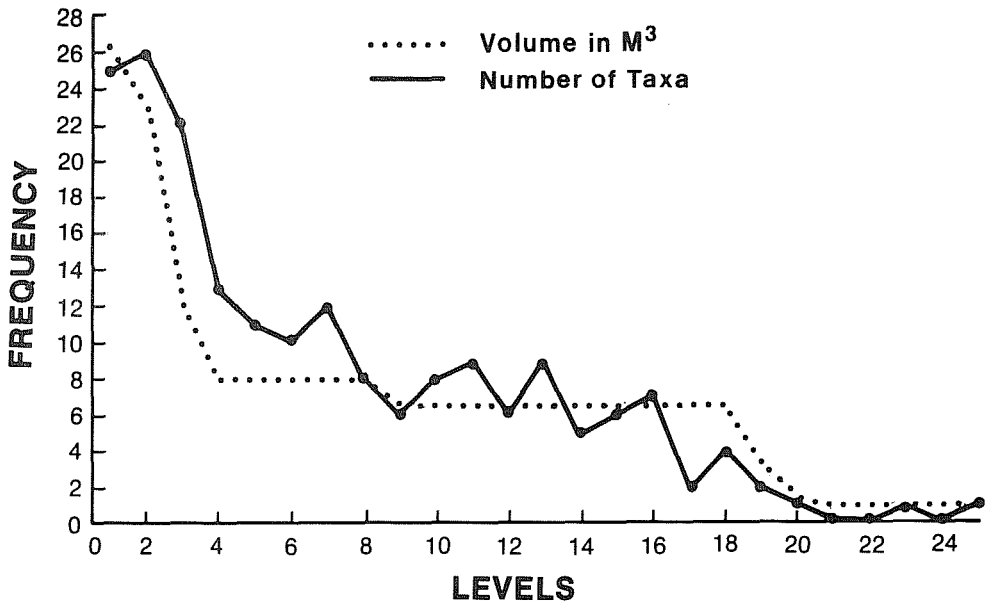

Figure 45. **Schematic Representation of the Correlation Between the Volume of Earth Excavated and the Number of Taxa Recovered.** The X axis lists the level number (the larger the number the deeper the level). The Y axis is a numerical listing for both the number of taxa and the volume of earth excavated.

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the volume of bone recovered has been examined by a variety of researchers, particularly Grayson (1973, 1979, 1981) who has cautioned about drawing conclusions based upon comparisons of faunal assemblages which are disproportionate in size. For 41 LK 201, this means that the presence of more taxa in the upper levels probably reflects a sampling bias.

To see if some other factor could have affected the number of taxa recovered through time, the relative number of taxa per cubic meter of earth excavated was analyzed (Table 33, column J). The mean number of relative taxa per cubic meter of earth excavated for the entire bone assemblage was 1.0, and the mean number of taxa per cubic meter of earth excavated per level appears to vary randomly around the mean for the entire sample. Nor could any relationship between the mean numbers and level be detected. Hall, Black, and Graves (1982:471) tentatively concluded in their preliminary analysis, based upon the examination of many sites in the Choke Canyon region, that there was a broader more diversified hunting pattern underway in the Late Prehistoric. This conclusion does not appear to be substantiated at 41 LK 201 by the more detailed analysis of the bone assemblage. While more taxa were indeed recovered from the upper levels (this can also be seen in Table 35), all classes of vertebrates (amphibians, birds, fishes, mammals, and reptiles) are represented in the deeper deposits of the Middle and Late Archaic levels as well as the deposits of the Late Prehistoric, and the reduction in number of genera can be accounted for by the sample bias.

To determine if other relationships between numbers and volume of bone recovered could be detected, the relative numbers and weights of bone per cubic meter of earth excavated were examined (Table 33, columns G and H). These relative amounts and volumes of bone in relation to level are also presented in Figure 46. If the amount of bone and earth accumulated uniformly through time at the site, the number and volume of bone would be constant from level to level. It is apparent in Figure 46, however, that this is not the case. The relative amounts and volume of bone fluctuate dramatically through time. Two particular periods, Levels 1-4 and 12-13, show very high concentrations of bone. With volume of earth being held constant then, these variations in bone concentration can be attributed to fluctuations in rates of bone destruction and dissolution, varying rates of soil accumulation, changes in intensity of site utilization, changes in intensity of area utilization within the site, or to variations in the selection of fauna represented at the site.

If destruction and dissolution of the bone were the major factors causing the fluctuations in the relative amount of recovered bone, one would expect that a relative greater number of bones would be recovered in the lower levels, as more bone was broken by soil compaction through time. Similarly, one would expect the mean weight of the individual bones to decrease through time as the pieces became smaller and were chemically dissolved. We see, however, that there is a general decrease in the number of bones (Fig. 46), while the mean weight of the individual bones per level appear to fluctuate randomly around the mean weight of individual bone based upon the total sample (0.4 grams; Table 33, column F). Therefore, geological processes do not seem to be the major factors affecting the structure of the bone assemblage through time. This view is substantiated by a subjective analysis of the surface structure of the bones. Bones recovered from 41 LK 201 appeared to be in remarkably good condition, irrespective of the level in the site from which they came.

Another possible factor which could be causing the fluctuation in relative numbers and volume of bone through time at the site are fluctuations in the rate of soil accumulation. If this were the case, however, one would expect the relationship of numbers of bone and the volume of bone to covary in a constant relationship through time. Since there is no strong correlation between numbers and volume of bone, changes in soil accumulation at the site cannot be documented (Fig. 46).

Intuitively, one would predict that fluctuations in the amount of bone at the site would reflect changes in frequency of use of the site by humans, or changes in the intensity of site utilization. Support for this hypothesis would be that the fluctuations in bone numbers and volume would have a strong positive correlation with the cultural debris at the site. While this data was not analyzed in detail, subjectively there appears to be a strong positive correlation. Assuming that the fluctuations are indeed reflecting primarily shifts in human utilization of the site, two periods of greater or more intensive utilization of the site can be documented. These are Levels 1-4 and 12-13, with the Late Prehistoric level apparently being a period of much greater utilization of the site by humans. Assuming that this difference does not reflect a spatial bias, the greater site utilization during Late Prehistoric times could indicate that the site was utilized more

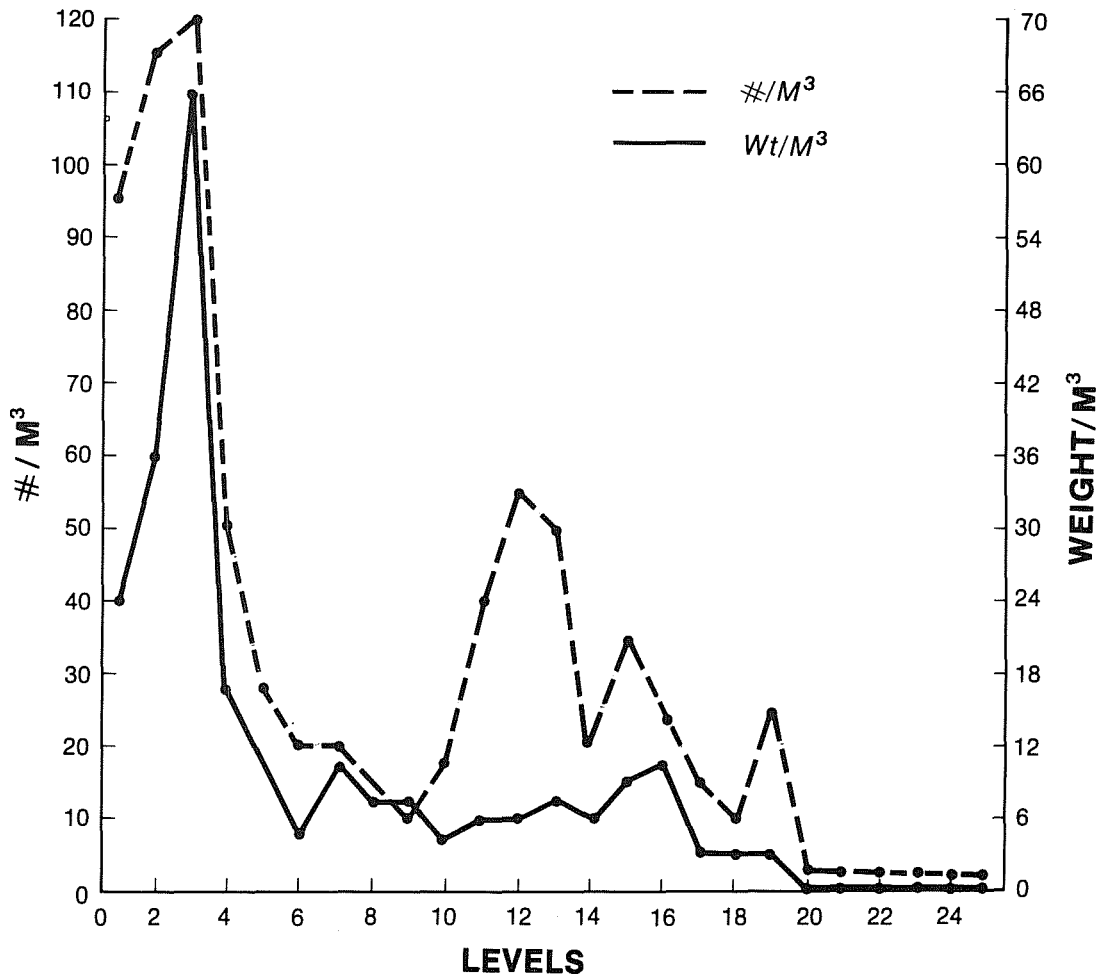

Figure 46. **Schematic Representation of the Correlation Between the Number of Bones Per Cubic Meter Recovered From Each Level and the Total Weight of the Bones Recovered From Each Level.** The X axis lists levels of excavation at site (the larger the level number the deeper the level). The left hand column of the Y axis lists the average number of bones recovered per cubic meter of excavated earth. The right hand column of the Y axis lists the average total weight of the bone recovered per cubic meter of excavated earth.

frequently, for longer periods of time, or that more people occupied the site. An examination of the bones or the bone assemblage provides us with little information to indicate which of these alternatives is correct. The only possible evidence along this line is that there appears to have been relatively more rabbits and rodents consumed during the Late Archaic, and more artiodactyls consumed during the Late Prehistoric (Table 34; Fig. 47). If these differences in relative numbers of rodents, lagomorphs, and artiodactyls reflect a real dietary shift, then it would not be untoward to propose that a larger population could have been supported at the site, at least at specific points in Late Prehistoric time. This does not necessarily mean that there was a greater population in south Texas in the Late Prehistoric as opposed to the Late Archaic; only that a greater population could have been maintained at the times the site was occupied. If these relationships of amounts of bones, and kinds of species represented are seen at other sites within the Choke Canyon area, and at other sites within south Texas, then, it may be that population trends can be detected.

The fourth type of phenomena which could be causing the fluctuations in the bone assemblage through time is either that vertebrated animals varied in their importance in the human diet, or that different species of vertebrated animals, and therefore different kinds of bone assemblages, are represented through time. Documenting relative importances of vertebrated animals through time on the basis of the size of the bone assemblage is most difficult. To be able to do so would require detailed knowledge of the relative size of the population through time, the frequency of site utilization through time, and the rate of soil accumulation. Because this information is not known for 41 LK 201 we cannot examine this possibility; we can only be aware that it may affect the structure of the assemblage.

There does, however, appear to be a shift in the kinds of animals recovered at the site at different points in time, and this appears to affect the structure of the assemblage itself. Table 34 lists the number of identified skeletal elements assignable to the Artiodactyla, Rodentia, and Lagomorpha. In addition to listing the number of identified elements for each of these orders, the table lists the number of identified elements of the most commonly recovered genera in each of these orders (bison, pronghorn, white-tailed deer, collared peccary, pack rat, cotton rat, jackrabbit, and cottontail rabbit). Figure 47 illustrates the relative numbers of identified elements for these three orders through time. Additionally, Table 35 provides a presence/absence listing of all of the fauna recovered from the site. By examining Table 35, it is apparent that there is a definite loss of reptiles from the earlier strata compared to the levels of the Late Prehistoric times. This loss accounts for at least some of the relative decrease in numbers of bones and weight since the fragments of turtle shells are common and relatively heavy in the layers in which they occur.

Another factor concerning the relative importance of the animals recovered which could be affecting the nature of the bone assemblage is that elements of large species occur more frequently in the later periods, and elements of smaller fauna are relatively more frequent in the earlier periods. This affects the structure of the bone assemblage because bigger animals have bigger, heavier bones that splinter into far more pieces than bones from the

TABLE 34. LISTING OF THE NUMBER OF IDENTIFIED ELEMENTS (NISP) RECOVERED FROM EACH LEVEL FOR THE ARTIODACTYLS, LAGOMORPHS, AND RODENTS

Level	Artiodactyla	Indeterminate	Bison	Antilocapra	Odocoileus	Dicotyles	Rodentia	Indeterminate	Neotoma	Sigmodon	Lagomorpha	Lepus	Sylvilagus
1	64	12	12	4	35	1	36	-	29	7	37	5	32
2	89	4	2	9	73	1	27	-	27	-	46	3	43
3	36	22	1	-	13	-	7	3	4	-	10	4	6
4	5	-	-	-	4	1	5	1	4	-	8	5	3
5	3	1	-	-	2	-	2	-	-	-	3	1	2
6	1	-	-	-	1	-	-	-	-	-	5	3	2
7	5	2	-	-	3	-	-	-	-	-	3	-	3
8	9	-	-	-	9	-	1	1	-	-	1	-	1
9	4	-	-	-	4	-	-	-	-	-	1	-	1
10	2	2	-	-	-	-	1	-	1	-	14	6	8
11	-	-	-	-	-	-	4	3	1	-	12	6	6
12	-	-	-	-	-	-	2	1	1	-	8	-	8
13	-	-	-	-	-	-	3	3	-	-	8	3	5
14	-	-	-	-	-	-	-	-	-	-	2	1	1
15	4	-	-	-	4	-	-	-	-	-	-	-	-
16	3	1	1	-	1	-	-	-	-	-	1	1	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	4	-	4
19	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: The number of elements listed for the artiodactyls, rodents, and lagomorphs consists of all elements identified for all of the taxa for that order. In addition to the listing for these three orders, the table lists the number of identified elements for the most commonly recovered genera within each of these orders.

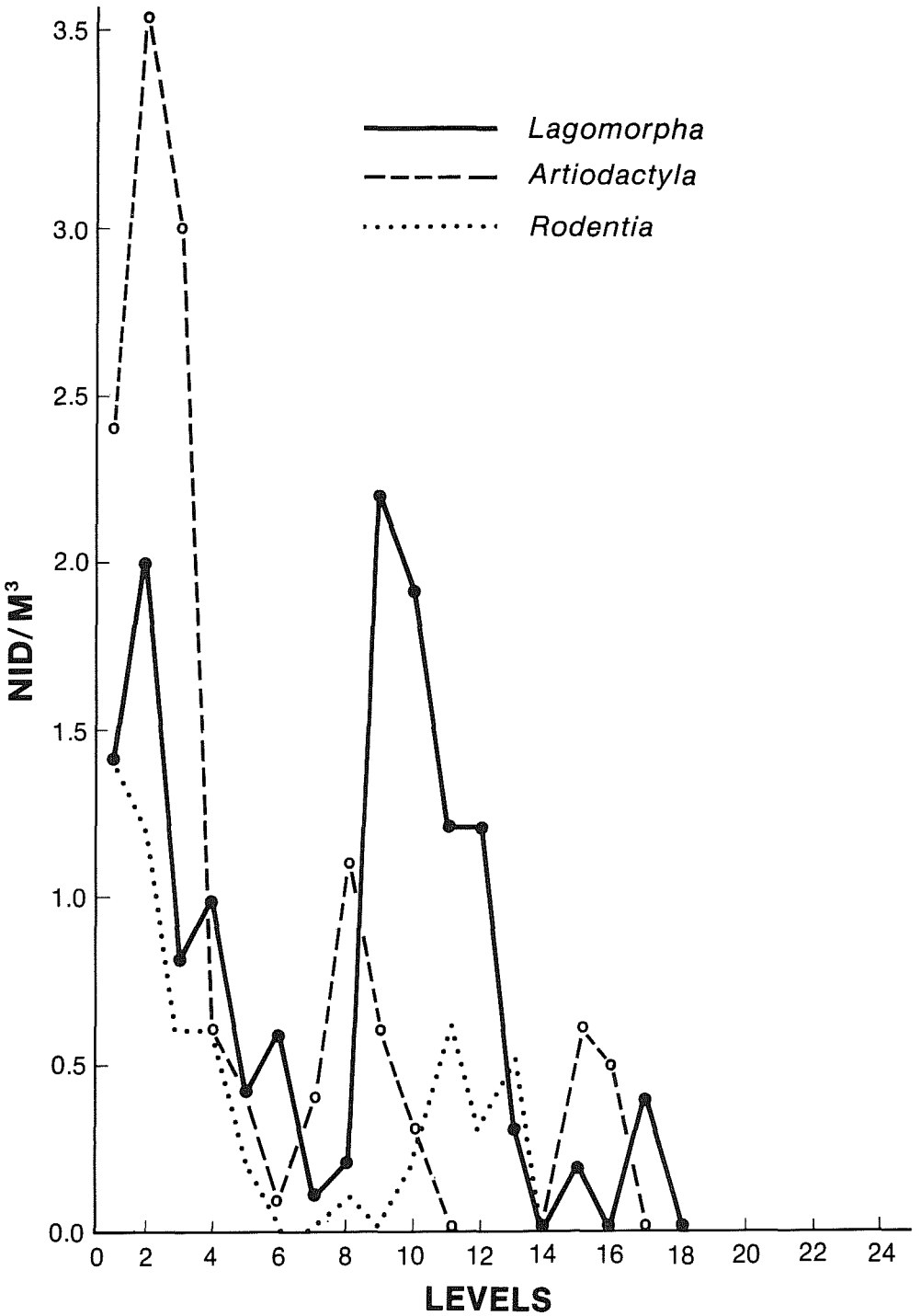

Figure 47. **Schematic Representation of the Number of Identified Elements Per Cubic Meter of Excavated Earth Per Level for Lagomorphs, Artiodactyls, and Rodents.** The X axis lists the levels of excavation at 41 LK 201. The Y axis lists the number of identified elements per cubic meter. The number of identified elements for the lagomorphs, artiodactyls, and rodents are represented separately.

smaller species. This variation in the relative frequencies of the bones of large versus smaller species is presented in Table 34 and Figure 47.

A final topic to consider concerning the boney assemblage concerns the forces which have reduced the bone to its recovered condition. Under ideal conditions if an animal dies, is immediately covered, and then is recovered before it has been removed by erosion from its death position we can recover a complete skeleton with all long bones intact, and in articulated condition. The boney assemblage of 41 LK 201 is a far cry from the aforementioned idealized condition. Virtually no complete bones were recovered from 41 LK 201, much less complete skeletons. An examination of the spirally fractured bones of the small animals indicated most of these were broken while they were fresh. In this respect they strikingly resemble the bones recovered from human coprolites (Stock 1983), which suggests that most of these were broken as the animals were being consumed, or while the bones were being passed through digestive tracts.

The long bones of the megafauna suggest a wider variety of conditions resulted in the reduction and dispersal of the bones. From the partially recovered remains of the bison, it is apparent for this species at least, not all of the bones were returned to the habitation area, or if they were they were dismembered and scattered beyond the excavated area. Many of the long bones of the larger fauna, particularly the deer remains, evidence cut marks resulting from the process of butchering. This process would also certainly have resulted in the dismemberment and dispersal of the bones. The bones of the large species also appear to have been intentionally reduced, possibly during marrow processing. This, too, is evidenced by the small average fragment size of the long bones of the large species, and the fact that most of the fractures appear to have occurred while the bones were fresh. Some of the bones are charred and burned, whether unintentionally or otherwise, and this too reduced their size and weight, and increased their susceptibility to fracturing. Additionally, there is evidence on some of the bones that they had been exposed to air drying while exposed on the surface, for their surfaces are marked by the fine line weathering cracks, and generally eroded and reduced.

In summary, it is apparent that while the bone assemblage is quite large and well preserved at 41 LK 201, it is necessary to be judicious as to which sorts of questions we attempt to answer through the analysis of the bone assemblage as well as in drawing conclusions to the questions we do raise. Presented below are some of the tentative conclusions which can be made on the basis of the analysis of the faunal remains.

DIETARY PATTERNS

What is immediately apparent about the faunal assemblage is the great diversity of taxa represented. As stated above, 32 genera are represented as well as nine taxa above the level of genus for which generic distinction could not be made. Assuming that the majority of these taxa were consumed by the human inhabitants of the site, then the inhabitants did indeed harvest a wide spectrum of fauna. When the list is examined by class we see that approximately 20 genera of mammals were utilized, one genus of amphibian;

eight genera of snakes, lizards, and turtles; at least three genera of fish; and at least one genus of birds. Even this list is conservative because some of the smaller fish and bird remains could not be assignable to genus, and are indicated in Table 35 only under the column of class indeterminate. This wide variety of animal fare has been noted consistently for hunting and gathering societies wherever they have been studied, including south Texas (Hester and Hill 1972, 1975; Hester 1975a, 1975b, 1980; Steele and Mokry n.d.).

In addition to summarizing the range of diet the human inhabitants consumed while at 41 LK 201, it is also possible to determine certain emphases. In numbers of taxa represented, mammals are by far the most common. This heavy reliance on mammals was also substantiated by the relative numbers of mammal bones compared with the bones of the species from other classes. While numbers of identified elements, or minimum numbers of individuals, have not been tabulated for all taxa because of the author's concern of the limitations of quantifying diverse assemblages (see Grayson 1973, 1978, 1979, and 1981 for an introduction to the critical reviews of these techniques), it was apparent that bones from mammals far outnumbered the bones of species from other classes. In fact, the difference was so great that it left little doubt as to the preponderance of mammals in the assemblage, and therefore the consistent utilization of mammals in the human diet.

When the mammalian portion of the assemblage is scrutinized in greater detail it is apparent that some taxa of mammals occur more consistently through time, and some taxa seem to occur more frequently in the assemblage within each level than others. At the ordinal level, artiodactyls, rodents, and lagomorphs occur throughout the assemblage, in all units, and in most layers. Carnivores, edentates (see the discussion below concerning this problematic taxon), and marsupials, on the other hand, occur less frequently. Within the artiodactyls, deer remains were the more frequently recovered; and this species probably represented the staple large mammal for the humans. Elements of bison, pronghorn, and collared peccary appear far less frequently in the sample. Bones of rabbits, both of the jackrabbit and the cottontail rabbit, were commonly represented in the site and at all levels. Pack rats and cotton rats were the most commonly recovered rodents.

As Grayson (1973, 1979, 1981) has aptly emphasized, the examination of the relative numbers of elements or the minimum numbers of individuals of taxa can often be misleading. However, if we compare the number of identified elements of the most frequent orders of mammal (the artiodactyls, rodents, and lagomorphs) we can at least get a reasonably accurate assessment of their relative numbers to one another, if not the actual number of animals harvested or consumed. This information is presented in Table 34 and Figure 47. By examining this data, we can state in the most general terms that larger mammals appear more frequently in the assemblage in Late Prehistoric times (Levels 1-3), and smaller mammals appear more frequently in the earlier times (particularly Levels 10-14). As stated above, this sort of data must be treated with utmost caution, but in this particular instance the differences between earlier and later times seems to be of a great enough magnitude, that the assemblage may indeed be reflecting a dietary shift among the human occupants of the site through time. Of course, what probably cannot be ascertained from the boney assemblage is whether this shift was

necessitated by the varying availability of the prey, or if the shift to larger game during the Late Prehistoric was made possible by the acquisition of more effective hunting techniques.

One note of caution should be made. Based on a review of ethnographic sources of historic coastal Indians, Campbell and Campbell (1981:17-18) stated that the Mariame Indians of south Texas obtained deer only now and then, rather than consistently. They also stated that deer were occasionally mass killed, as many as 200 to 500 at a time. Such feast or famine conditions as far as deer are concerned could be difficult to infer from the faunal assemblage, and it is conceivable that the increase in megafauna during Late Prehistoric times could be a result of sporadically taking larger numbers of deer than were taken previously. If this were the case, then the increased deer bones may reflect more deer taken, but the deer may not necessarily play a more important role in the overall diet of the people.

Excluding the mammals, it is difficult to determine the relative importance the other classes played in the diet of the humans. Reptiles, particularly turtles, were relatively commonly identified in the assemblage, but this could easily be a reflection of the relative ease of identifying turtle remains, or the relative durability of turtle shell fragments. Another problem with assuming the relative importance of turtles in human diet concerns the wide variety of uses for turtle shells. Therefore, it is quite possible that some of the identified turtle shells in the assemblage represent material objects rather than food refuse. The spiny softshell turtle, however, undoubtedly represents a food resource since its shell is too flat, irregular, and prone to fragmentation to have been of much use as a tool or ornament.

Fish remains were also consistently found in the site and from a variety of layers. The presence of the freshwater drum is particularly interesting because it is known to spawn in the spring, and be more easily caught during this season. The sectioned otolith from the freshwater drum recovered at the site indicates that the fish was taken in the spring, therefore suggesting that at least this species of fish may have been seasonally important. A more thorough analysis of all of the fish remains for all of the species may determine if this class of vertebrates was consistently a spring staple, or if they were harvested during several seasons.

Little can be said about the dietary significance of amphibia or birds. One frog element was recovered from Late Prehistoric times, but such a meager representation does not even indicate its utilization by humans. The only bird remains identified to genus were those of turkey. This is one of the largest birds in south Texas, and would certainly have been sought as a meal if there were no social mores protecting it.

A final topic to be considered while discussing human diets concerns the preparation of bone meal, or the rendering of marrow and bone grease. Campbell and Campbell (1981:17) documented the rendering of fish bone into meal by south Texas Indians, and marrow processing is a well-documented phenomena among a variety of peoples throughout the world. Documenting the preparation of bone meal from the boney assemblage remaining is impossible, so little can be said about this practice. On the other hand, marrow and/or

TABLE 35. LIST OF THE VERTEBRATE TAXA RECOVERED FROM 41 LK 201

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PHYLUM: CHORDATA																				
CLASS: INDETERMINATE	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CLASS: OSTEICHTHYES																				
Order: Lepisosteiformes																				
Lepisosteidae																				
Lepisosteus	x	x	-	x	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
Order: Cypriniformes																				
Ictaluridae																				
Genus indeterminate	x	x	x	-	-	-	-	-	x	-	-	x	x	x	-	-	-	-	-	-
Order: Perciformes																				
Sciaenidae																				
Aplodinotus	x	x	x	x	x	-	-	-	-	-	-	-	x	-	-	-	-	-	x	-
CLASS: AVES																				
Order: Indeterminate	x	x	x	-	x	-	x	-	x	-	x	-	-	x	x	-	-	-	-	-
Order: Galliformes																				
Meleagridae																				
Meleagris	-	x	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-
CLASS: AMPHIBIA																				
Order: Anura																				
Family: Indeterminate	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CLASS: REPTILIA																				
Order: Crocodylia																				
Alligatoridae																				
Alligator	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order: Squamata																				
Suborder: Lacertilia																				
Iguanidae																				
Sceloporus	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suborder: Serpentes																				
Family: Indeterminate	x	x	x	x	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-
Family: Crotalidae																				
Crotalus	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order: Testudines																				
Family: Indeterminate	x	x	x	x	-	-	x	-	-	-	x	-	x	-	-	x	-	-	-	-
Emydidae																				
Chrysemys	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terrapene	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kinosternidae																				
Kinosternon	-	-	x	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Testudinidae																				
Gopherus	x	x	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Trionychidae																				
Trionyx	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 35. (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CLASS: MAMMALIA																				
Order: Marsupialia																				
Didelphidae																				
Didelphis	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order: Artiodactyla																				
Family: Indeterminate	x	x	x	-	x	-	x	-	-	x	-	-	-	-	-	x	-	-	-	-
Antilocapridae																				
Antilocapra	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bovidae																				
Bison	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Cervidae																				
Odocoileus	x	x	x	x	x	x	x	x	x	x	-	-	-	-	x	x	-	-	-	-
Tayassuidae																				
Dicotyles	x	x	-	x	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-
Order: Carnivora																				
Canidae																				
Canis	x	-	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Felidae																				
Felis	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mustelidae																				
Taxidea	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Procyonidae																				
Procyon	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order: Edentata																				
Dasypodidae																				
Dasypus	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order: Lagomorpha																				
Leporidae																				
Lepus	x	x	x	x	x	x	-	-	-	x	x	-	x	x	-	x	-	x	-	-
Sylvilagus	x	x	x	x	-	x	x	x	-	x	x	x	x	-	-	-	-	x	-	-
Order: Rodentia																				
Heteromyidae																				
Liomys	-	x	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-
Perognathus	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Muridae																				
Baiomys	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microtus	-	-	-	-	-	-	-	x	-	-	x	-	-	-	-	-	-	-	-	-
Neotoma	x	x	x	x	x	-	-	-	-	x	x	x	x	-	x	-	-	-	-	-
Ondatra	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peromyscus	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reithrodontomys	-	-	-	-	-	-	x	-	-	-	-	x	-	-	-	-	-	-	-	-
Sigmodon	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	x	x	x	-	-
Sciuridae																				
Sciurus	-	-	x	x	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-

bone grease rendering does seem to be documentable. Many of the long bones of the artiodactyls are fragmented into small pieces, the breaks appearing to be green bone breaks, and this may be evidence of marrow processing.

HUNTING AND HARVESTING PATTERNS

When we examine the faunal assemblage it is possible to infer some of the hunting and foraging behaviors of the human occupants of 41 LK 201. One of the most obvious points to make is that the humans hunted and foraged in a very wide variety of habitats. The presence of pronghorn, bison, badger, collared peccary, Mexican spiny pocket mouse, and hispid pocket mouse suggests that the humans were hunting and foraging in a grassland or non-riverine scrubland. The presence of squirrels, raccoon, opossum, and white-tailed deer suggests hunting and foraging in a woodland, possibly a riverine woodland environment. The presence of fish, water turtles, and possibly the frog remains, attests to the humans harvesting water resources.

Another possible inference about human hunting patterns can be based upon animals which do not appear to be represented in the assemblage. While we must treat negative evidence with utmost caution, it does appear that there is a definite absence, or scarcity, of nocturnal, burrowing, or of arboreal animals represented in the assemblage. The only nocturnal animals represented are the raccoon (four identifiable elements) and the opossum (one identifiable element). All other animals represented in the assemblage could easily have been harvested during daylight hours. The badger (two identified elements) is the only unequivocal burrower in the assemblage. What appears to be conspicuously absent are other burrowing mammals, such as the ground squirrels and possibly the prairie dog, if the species occurred in the region. The only arboreal animals represented are the opossum, raccoon, and possibly a tree squirrel, and these are relatively scarce in the assemblage. If these underrepresentations reflect a real bias in hunting patterns, then it suggests that the humans most commonly utilized daylight hunting patterns in the grassland/scrubland habitat.

The fish remains are particularly illustrative of harvesting patterns. Small vertebral elements and scales of minnow-sized fish were recovered from the microscreened portion of the sample which was analyzed. These were far too small to have either been speared or caught on a hook. This would suggest then that at least these small fish were harvested by netting, driving them into shallows, or by poisoning.

A hunting pattern previously mentioned, which may be reflected in the assemblage, is suggested by the shift from hunting predominately small game to hunting predominately larger game. Table 34 and Figure 47 document a shift from smaller game utilization, particularly rabbits, in the Late Archaic to a greater utilization of big game, particularly white-tailed deer (**Odocoileus virginianus**) in the Late Prehistoric. Such a shift could have been precipitated in a variety of ways. It is possible that during the Late Archaic the larger fauna, particularly deer, were not as prevalent as in Late Prehistoric times. For example, if there was less woodland or edge environment earlier, then deer may have been less prevalent. An alternate hypothesis would be that a shift in hunting strategies or behavior may have

made the hunting of larger species more efficient. Three such conceivable hunting behavioral shifts could have been: (1) more time spent hunting woodlands or edge environments; (2) more frequent mass kills; or (3) greater killing efficiency by hunters equipped with the bow and arrow. It is difficult, if not impossible, at the present time to determine which of these alternative hypotheses is more likely. It is an interesting problem to consider though, and one which may be answerable when more stratified sites are analyzed.

SEASONAL UTILIZATION OF 41 LK 201

One of the most frequently asked questions about a site is during which seasons was it occupied; and the analysis of faunal remains usually provides us with the most reliable evidence to answer this question.

Table 36 lists by level the evidence for determining seasonal occupation for 41 LK 201, and the inferred seasons of occupation. The site appears to have been frequently occupied in the spring (Levels 1, 2, 5, and 8) and possibly in the latter part of the year as well (Levels 1, 3, and 9). Additionally, the terrestrial amphibians and reptiles taken in Levels 1-4 and 6-8 are suggestive of warm weather occupation.

TABLE 36. LISTING OF THE FAUNAL EVIDENCE SUGGESTIVE OF SEASONAL OCCUPATION AT 41 LK 201

LEVEL	SEASON	FAUNAL EVIDENCE
1	spring	Foetal deer remains Foetal Cervid remains Fish otolith in initial stage of spring growth
	summer-winter	Young deer remains
2	spring	Foetal or newborn pronghorn remains
3	summer	Deer antler possibly in velvet
5	spring-summer	Subadult bird remains
8	spring-summer	Subadult rabbit remains
9	summer-winter	Young deer remains

NOTE: The left hand column lists the level from which the remains were recovered. The center column lists the inferred season of occupation based upon the remains (for those cases where more than one season is listed, such as summer-winter, the evidence indicates the animal could have been harvested at any time during the indicated period). The right hand column lists the faunal evidence used to infer the season of occupation.

Before this data is accepted in total, a series of comments are in order. The identification of springtime occupation is usually the easiest since the remains of foetal, newborn, or very young animals are usually associated with spring. At 41 LK 201, foetal or young remains of deer, pronghorn, rabbit, and birds all document occupation of the site during this season. There was less positive evidence of summer, fall, or winter occupation. No migratory bird remains were recovered which are positive indications of occupation during these seasons. The evidence that did indicate occupation during the latter part of the year was the presence of an antler fragment which appeared to have been incompletely hardened at the time of death. Since deer antlers are growing during the summer and hardened by fall, this fragment would suggest the animal probably was taken during the summer. In addition to this fragment, two dental fragments were recovered which contained moderately worn deciduous premolars. These teeth are erupted and in occlusion at birth, or shortly thereafter, and are replaced by their permanent counterparts by 18 months (Gilbert 1980). This would suggest that the deciduous premolars, which were moderately worn, were from an animal older than a fawn, but still relatively young. I have interpreted this to suggest that the animals were possibly taken sometime between the summer and the winter. While this is not a very accurate age assessment, it does document that the site was occupied more than just in the spring.

ENVIRONMENTAL RECONSTRUCTION

When we attempt to reconstruct the environment around the site at the time of human occupation there are two basic questions we are asking. The first is what kinds of habitats were available for the people to exploit. The second question is what were the general environmental conditions around the site.

For some animals their habitat preferences are specific enough so that if the animal remains are present within a faunal assemblage we can assume that their preferred habitat was also present in the area. Table 37,a lists those animals which have reasonable specific habitat preferences and the types of habitats which they prefer. From the list we can infer that grasslands were available as well as forested or treed areas, and permanent water. These areas were to be expected since they are present around the site today, or were around the site during historical times.

Reconstructing the general environmental conditions around the site is, however, more difficult. Today the area south of the Balcones Escarpment, and between the Nueces River and the Rio Grande is identified as the Tamaulipan Biotic Province (Blair 1950, 1952). Blair (1952) has characterized the area as the meeting ground of the Plains, Eastern Woodlands, and Mexican biotic communities. Consequently, the fauna of the region is quite heterogeneous, containing elements from all three of these biotic communities. It would be interesting to know how long the communities have existed in this region. Certainly, the region has developed its unique faunal assemblage since the end of the Pleistocene, approximately 10,000 years ago, but we would like to be more precise than that. Did these three biotic communities come to meet in this region during the early Holocene, or is their meeting here a quite recent phenomenon?

TABLE 37. TAXA RECOVERED FROM 41 LK 201 INDICATING HABITAT AND BIOTIC COMMUNITIES

a, listing of the inferred habitats surrounding the site with the taxa recovered from the site which suggests the presence of the habitat.

Grassland/Scrubland	Forest/Forest Edge	Aquatic Environment
Antilocapra	**Odocoileus**	Testudines
Bison	**Procyon**	Osteichthyes
Dicotyles	**Didelphis**	**Ondatra**
Taxidea	**Microtus**	
Sigmodon		
Neotoma		

b, taxa associated with a specific biotic community.

Plains Mammals	Mexican/Southwestern Mammals	Eastern Woodland Mammals
Antilocapra	**Dicotyles**	**Sylvilagus floridanus**
Bison	**Dasypus**	**Microtus pinetorum**
Taxidea	**Sylvilagus audubonii**	**Ondatra**
	Liomys	
	Baiomys	

Certainly, we have seen dramatic changes in the floral and faunal communities of the region within the last hundred years. Florally, we have seen the reduction and loss of grasslands in south Texas, and their replacement with a mesquite dominated scrubwood floral community (Johnston 1963). Faunally, we have seen the loss of bison, pronghorn, wolf, and bear from the region; and possibly the recent intrusion of the armadillo. The question is were the changes the result of recent climatic changes? Or, did they result from changes in land use following the replacement of the indigenous American Indian population by Europeans? If these changes were the result of recent climatic changes in the region one would infer that prehistorically the area would have been wetter, and that the apparent invasion of the mesquite, and possibly the armadillo, were the result of a drying trend. Therefore, one would predict few Mexican faunal elements would be found prehistorically, and that there would be more Eastern Woodland species found. In other words, the Tamaulipan Biotic Province as we know it today would be a very recent phenomenon. On the other hand, if the changes noted were principally the result of changes in the human population, then the changes could not be used to infer past prehistoric conditions, and the Tamaulipan Biotic Province could be of greater antiquity.

Using the presence of specific animal species it is possible to test these hypotheses. Table 37,b lists mammals which can be reasonably correlated with specific Plains, Mexican/Southwestern, or Eastern Woodland biotic communities. Clearly, all three communities were present in the region in the past. Of particular note are the species which are generally associated with biological communities to the south. **Dicotyles** has been recovered from Level 4 and probably Level 10; **Baiomys** has been recovered from Level 6; and **Lyomys** has been recovered from Levels 2, 3, and 11. A date of 480 B.C. has been established for Level 12 which would suggest then, that these Mexican faunal elements have been in the region for at least 2000 years. This evidence suggests that the Tamaulipan Biotic Province, or a facsimile thereof, has been established in the region at least that long.

It is also important to note that two species which no longer occur in the region have been found prehistorically, and both of these species are associated with an Eastern Woodland biotic community. These two species are **Microtus pinetorum**, the pine vole, and **Ondatra**, the muskrat. Today, the pine vole is restricted to the northeastern portion of the state and penetrates southwestward as far as the central Texas portion of the Edwards Plateau. It has not been recovered recently south of the Balcones Escarpment. The muskrat, today, is found in three disjunct regions: along the Pecos River, in northern Texas, and in the upper Texas coastal region east of the Colorado River (Schmidly 1983). The presence of both of these species within the vicinity of the site prehistorically would suggest that conditions were more conducive to the survival of these Eastern Woodland species than they are today. Whatever these conditions were though, they did not seem to limit the northern distribution of the southern species present in the vicinity.

This increased diversity of faunal remains in prehistoric times has been noted previously (Hibbard 1960; Dalquest 1965a; Lundelius 1974), particularly for the Pleistocene. The commonly posited explanation for this greater diversity of faunal remains than today, is that more equable climates would have permitted greater faunal mixing. During the Pleistocene, local climates

presumably were milder both in the winter and in the summer than today. Consequently, northern animals, limited by hot summers could have penetrated farther south, at the same time that southern animals limited by cold winters could have penetrated farther northward. The result would be large areas of the continent which would contain faunal assemblages consisting of both northern and southern species. During Holocene times, however, the presumed loss of the climatic equability caused the retreat northward and eastward of the species tolerant of moist conditions and intolerant of hot summers. If this model is correct, then the heterogenous faunal assemblage from 41 LK 201 may suggest that these climatic conditions creating heterogenous assemblages existed well into the Holocene in southern Texas; indeed existed more recently than was previously anticipated.

The greater diversity of fauna can also be explained by proposing that a greater mosaic of microhabitats existed in the past. Such a condition would exist if a predominantly xeric upland habitat existed, but that more surface water existed along the streams and in poorly drained wetlands. The aquatic and wetland habitats would be suitable for **Ondatra** and **Microtus**, while the uplands would have supported the more xeric adapted species as they do today. The loss of the wetlands could have been brought about by changes in the terrain and stream conditions without associated changes having occurred in the climate. For example, we know within the 20th century there has been a loss of surface water as overgrazing, plowing, and clearing has changed the nature of the riparian habitats which protect the streams, and the water table has dropped.

Gunn **et al.** (1982) has also attempted to reconstruct past climatic conditions in southern Texas but has taken a different approach. By projecting current climatic trends backwards into antiquity, Gunn has hypothesized that there were alternating periods of wet and dry conditions during the past 5000 years. These fluctuations could be permutations of a predominantly dry climate as today, or a climate which was predominantly wetter and more seasonably equitable than today. Based upon Gunn's model, times during which Levels 1-3 were deposited at 41 LK 201 would have been wet, as would have been the times during which Levels 12-17 were deposited. Sometime during the period when Levels 4-11 were deposited, south Texas was drier. It is difficult to predict how faunal assemblages would have reacted under these proposed alterations of wet and dry periods. Would there actually have been significant changes in the kinds of species present in the region, or would the faunal community essentially have retained its character throughout these changes, but reacted by increasing and decreasing the relative numbers of individuals within each species? Unfortunately, the faunal assemblage from 41 LK 201 is not adequate to resolve this question. The reason is that the assemblage is composed mainly of animals which lived during the wet periods associated with Levels 1-3 and 12-17. Remains of species that would have been harvested during the dry period between these two wet periods are too limited in number to represent adequately the general faunal community of the time. Therefore, it is difficult to say that there were significant changes in the species present in the region. We can say, however, that the faunal assemblages during the wet periods appear to be essentially the same as each other, and as the faunal assemblage is today. This would seem to suggest that if there was much of a change during the dry period, it was a loss in

numbers of indigenous species that was not accompanied by an associated influx of more heat tolerant southern species.

In summary, the vertebrate remains recovered from the site suggest that the fauna typical of the Tamaulipan biotic community has existed in the region for the last 2000 years. The only difference which has been noted is that two species of vertebrates, typical of more northern and eastern faunas also occurred in the region prehistorically. This data, in general, supports previous findings that prehistoric faunal communities were more diversified than present-day faunal communities. The data cannot, however, resolve the conflict of alternative climatic models for the Holocene.

DESCRIPTION OF TAXA

Presented below is the description by taxon of the faunal remains recovered from 41 LK 201. Classification of the fishes follows Blair **et al.** (1968). Classification of the amphibians and reptiles follows Conant (1975). Classification of the birds follows Robbins, Brunn, and Zim (1966). Classification of the mammals follows Davis (1974), Hall (1981), and Schmidly (1977, 1983). Where these authors differ in their classification of the mammals, I have indicated which authority has been followed. Each taxonomic description includes a list of the material assigned to that taxon identified to the unit and level from which it came. Following the list of referred materials for the taxon are remarks pertinent to the systematics of the taxon, discussions of the ecological inferences based upon the taxon, and/or information concerning human behavior as inferred from an analysis of the remains of the taxon.

PHYLUM: CHORDATA

SUBPHYLUM: VERTEBRATA

CLASS: Indeterminate (vertebrates)

Referred Material: Material from virtually all levels and squares of the site. Material consists of bone fragments unidentifiable other than as bone.

Remarks: This category includes bone from all sizes of species, but the highly comminuted long bone fragments of large mammals make up the bulk of the material. The significance of this fragmented material is that the large percentage of green bone breaks, highly comminuted nature, and surficial alterations by burning and scouring during butchering are indicative of an assemblage resulting largely from human activity.

CLASS: OSTEICHTHYES

ORDER: Lepisosteiformes

FAMILY: Lepisosteidae

GENUS: **Lepisosteus**

SPECIES: Indeterminate (gar)

Referred Material: N497 E996, Level 4; N497 E997, Level 4; N497 E998, Levels 4-5; N498 E998, Level 4; N504 E1012, Levels 1-2; N504 E1013, Level 1; N505 E1013, Level 2; N504 E1010, Level 1; N504 E1011, Levels 1-2; N505 E1010, Level 1; N504 E1008, Levels 1-2; N504 E1009, Levels 1-2; N505 E1008, Levels 1-2; N505 E1009, Levels 1-2; N505 E1014, Level 2; N506 E1009, Levels 1-2; N507 E1008, Levels 1-2; N507 E1009, Levels 1-2; N506 E1011, Level 1; N507 E1010, Levels 1-2; N507 E1011, Levels 1-2; N508 E1012, Level 1; N508 E1010, Level 1; N508 E1011, Level 1; N509 E1010, Level 1; N510 E1020, Levels 5, 8; N509 E1011, Level 1; N508 E1009, Levels 1-2; N509 E1008, Level 2; N509 E1009, Levels 1-2; N506 E1012, Levels 1-2; N507 E1012, Level 2; N507 E1013, Level 2; N508 E1007, Level 1; N509 E1007, Level 1; N508 E1013, Level 1; N509 E1012, Level 2; N509 E1013, Level 2. Material consists of predominately scales and occasionally cranial fragments.

Remarks: One of the most commonly recovered and most easily recognized structures of the fish material were the ganoid scales of the gar fish. Consequently, they give the probable false impression that these were the most commonly harvested fish. There is but one genus recognized in the family Lepisosteidae, but within Texas there are at least three species recognized: **L. spatula, L. platostomus,** and **L. productus.** Distinguishing these on the basis of the fragmentary remains recovered was not possible.

ORDER: Cypriniformes

FAMILY: Ictaluridae

GENUS: Indeterminate (catfish)

Referred Material: N490 E1043, Levels 12-14; N500 E997, Levels 3, 13; N500 E998, Level 9; N504 E1011, Level 2; N505 E1011, Level 2; N504 E1008, Levels 1-2; N504 E1009, Level 2; N505 E1014, Level 1; N507 E1009, Level 1; N508 E1012, Level 1; N509 E1010, Level 1; N509 E1009, Level 2; N506 E1013, Level 2; N507 E1013, Level 2; N508 E1007, Level 1; N509 E1012, Level 2; N509 E1013, Level 2; N510 E1020, Levels 1-3. Material

consists predominantly of vertebrae, three cranial fragments, and one otolith.

Remarks: Catfish are ubiquitous throughout the southern half of the United States, the region containing six genera and 24 species. Distinguishing the taxa on the basis of the fragmentary material recovered from 41 LK 201 was not possible. One of the few things which can be said of the material is that it appears to be all from relatively small catfish with the exception of the specimen represented by the otolith. Based upon comparative specimens available, this fish would have probably been over 30 cm long.

ORDER: Perciformes

FAMILY: Sciaenidae

GENUS-SPECIES: **Aplodinotus grunniens** (freshwater drum)

Referred Material: N505 E1008, Level 1; N506 E1012, Level 1; N508 E1013, Level 2; N509 E1012, Level 2; N510 E1020, Levels 2-4; N500 E997, Levels 5, 13; N500 E998, Level 19. Material consists of nine otoliths, three isolated teeth, and one maxilla.

Remarks: Among the Sciaenidae, the black drum (**Pogonias cromis**) and the freshwater drum (**Aplodinotus grunniens**) have remarkably similar otoliths and teeth, and both species can be found in the bays and in the mouths of the rivers emptying into the Gulf of Mexico. As far inland as 41 LK 201, only the freshwater drum is found in the waters. Therefore, identification as to species is made on the assumption that the fish were collected near the site.

Five otoliths were collected at the site, and the maximum length measured for each are as follows: 14.1 mm, 16.3 mm, 18.5 mm, 18.9 mm, and 20.1 mm. To get some perspective on the size of the fish represented by the archaeological specimens, they can be compared to two specimens collected from southern Texas and housed in the Comparative Faunal Collections, Department of Anthropology, Texas A&M University. A small otolith 14.5 mm in length was recovered from a fish 325 mm in total length (includes tail length) and 500 g in fresh weight. A large otolith 22.75 mm in total length was recovered from a fish 480 mm in total length and 1700 g in fresh weight. The fish represented in the archaeological assemblage then, would have been large enough to have been speared or caught by hook, as well as poisoned, netted, or driven.

Additionally, one of the specimens (N506 E1012, Level 1) was sectioned, and an examination of the growth rings indicated

that the fish was taken at the beginning of a growth cycle (presumably early spring).

CLASS: AVES

Order: Indeterminate (birds)

Referred Material: N490 E1042, Level 3; N490 E1043, Level 3; N504 E1012, Level 2; N505 E1013, Level 2; N504 E1011, Level 1; N509 E1010, Level 2; N506 E1012, Levels 1-2; N507 E1012, Level 1; N507 E1013, Levels 1-2; N508 E1007, Level 1; N508 E1013, Level 1, N490 E1043, Level 5; N490 E1044, Level 7; N497 E998, Level 15; N499 E996, Level 14; N499 E998, Level 9; N500 E998, Level 11. Material consists of long bone and pelvic fragments.

Remarks: While this material could not be identified beyond the level of order, there were a variety of species present based upon the size range of the bones. Most of the unidentified bird material, however, consisted of bones from small birds within the size range of the song birds, quail, etc. One bone (N490 E1043, Level 5) was from a subadult bird which would suggest a probable spring or summer period of occupation of the site at this level.

ORDER: Galliformes

FAMILY: Meleagridae

GENUS-SPECIES: **Meleagris gallopavo** (wild turkey)

Referred Material: N509 E1008, Level 2; N491 E1043, Level 9. Material consists of a humerus fragment and a left femur fragment.

Remarks: There is but one species of turkey recognized within the United States, and only one genus within the family. While it can be difficult to distinguish wild from domestic turkeys skeletally, it is assumed that these remains represent the wild form since the species is indigenous to the immediate area of the site, and there is no evidence that hunting and gathering bands of the region had access to domesticated forms during the Late Prehistoric.

CLASS: AMPHIBIA

ORDER: Anura

FAMILY: Indeterminate (frogs and toads)

Referred Material: N507 E1008, Level 2. Material is one humerus.

Remarks: The size of the humerus falls within the range of the large species of **Rana**, however, no diagnostic features indicative of the genus could be recognized.

Amphibians are probably consistently underrepresented in sites because the bones are so fragile, therefore subject to destruction. The other difficulty is that because the bones lack clear diagnostic features, fragments rarely can be recognized even if they are recovered.

CLASS: Reptilia

ORDER: Crocodylia

FAMILY: Alligatoridae cf. **Alligator** (alligators)

Referred Material: N500 E997, Level 3. Material consists of fragments of a scute.

Remarks: The material recovered represents fragments of small boney material which compares favorably with alligator scutes. Unfortunately, the material is too limited to be positively identified. Today, alligators are present in the Nueces River drainage, therefore their presence at the site would not be untoward.

ORDER: Squamata

SUBORDER: Lacertilia

FAMILY: Iguanidae

GENUS: **Sceloporus**

SPECIES: Indeterminate (spiny lizards)

Referred Material: N491 E1043, Level 3. Material is a mandible.

Remarks: **Sceloperus** is a common genus to the area today, and is in fact a genus ubiquitous throughout most of the state and the greater Southwest. Identification to species is difficult because six of the 10 species of spiny lizards listed by Conant (1975) as present in Texas occur within or near the region of the site.

SUBORDER: Serpentes

FAMILY: Indeterminate (snakes)

Referred Material: N490 E1043, Levels 3-4; N491 E1042, Level 3; N491 E1043, Level 3; N491 E1044, Levels 2-3; N497 E997, Level 3; N504 E1013, Level 2; N504 E1010, Level 1; N504 E1011, Level 2; N509 E1010, Level 2; N507 E1013, Level 1; N508 E1013, Level 1, N510 E1020, Level 8; N490 E1044, Level 6; N491 E1043, Levels 6-8; N491 E1044, Levels 6-7. Material consists of individual vertebrae.

Remarks: While identifying the larger vertebrae of snakes to this suborder is relatively easy, identification below this level is relatively difficult. Based on the size range of the vertebrae recovered, it is apparent that different sized snakes and probably different species were collected by the humans.

FAMILY: Crotalidae cf. **Crotalus** (rattlesnakes)

Referred Material: N505 E1014, Levels 1-2. Material consists of vertebrae.

Remarks: These vertebrae were identified to this genus on the basis of structure. The vertebrae are also quite large and beyond the range of most of the other genera of snakes found within or near the region today.

ORDER: Testudines

FAMILY: Indeterminate (turtles)

Referred Material: N490 E1043, Level 4; N498 E996, Level 3; N499 E997, Levels 2-3; N500 E996, Level 3; N500 E998, Level 4; N504 E1012, Level 2; N505 E1013, Level 2; N504 E1011, Level 1; N504 E1008, Level 2; N504 E1009, Levels 1-2; N505 E1008, Level 2; N505 E1009, Level 2; N505 E1014, Level 2; N506 E1009, Level 2; N507 E1008, Level 2; N507 E1009, Level 1; N506 E1010, Level 1; N506 E1011, Level 1; N507 E1010, Levels 1-2; N507 E1011, Level 2; N508 E1012, Level 2; N508 E1010, Level 1; N508 E1011, Levels 1-3; N509 E1010, Levels 1-2; N509 E1011, Levels 1, 3; N508 E1009, Levels 1-2; N509 E1008, Levels 1-2; N509 E1009, Levels 1-2; N506 E1012, Level 2; N506 E1013, Level 2; N507 E1012, Levels 1-2; N507 E1013, Levels 1-2; N508 E1007, Level 1; N509 E1007, Level 1; N508 E1013, Level 2; N509 E1013, Levels 1-2; N510 E1020, Level 5; N491 E1043, Levels 11, 16; N491 E1044, Level 7; N497 E998, Levels 7, 13. Material consists of fragments of turtle carapace and plastron scutes.

Remarks: Fragments of turtle shell are scattered throughout the site, and in many levels. While these fragments have not been identified, most of this material probably is assignable to the species which has been identified from the assemblage.

FAMILY: Emydidae

GENUS: **Chrysemys**

SPECIES: Indeterminate (water turtle)

Referred Material: N506 E1010, Level 1. Material is a carapace fragment.

Remarks: Only one single fragment of the carapace could be identified to this genus. Today there are two species of the genus which occurs in the general range of the site. Of these, the pond slider, **C. scripta**, is the most common today, and is more commonly found in stagnant or slow moving waters similar to those near the site.

GENUS: **Terrapene**

SPECIES: Indeterminate (box turtle)

Referred Material: N491 E1043, Level 4; N497 E997, Level 3; N504 E1010, Level 1; N504 E1011, Level 2; N505 E1011, Levels 1-2; N506 E1009, Level 2; N506 E1011, Level 2; N508 E1012, Level 2; N509 E1011, Level 3; N508 E1013, Level 2; N490 E1043, Level 6; N491 E1044, Level 5. Material consists of carapace and plastron scutes and two right humeri.

Remarks: While most of the material was assigned only to the genus, one scute (N490 E1043, Level 6) was tentatively assigned to **T. ornata**. Two species of box turtle, **T. ornata** and **T. carolina**, are found in Texas and, of these, **T. ornata** is a resident of the locality today. Conant (1975) lists this species as a resident of the prairies and more tolerant of arid conditions than **T. carolina**.

FAMILY: Kinosternidae

GENUS: **Kinosternon**

SPECIES: Indeterminate (mud turtle)

Referred Material: N491 E1044, Level 3; N491 E1043, Levels 5-7. Material consists of turtle plastron scutes.

Remarks: There are two species of the aquatic mud turtles in the Texas coastal area, **K. flavescens** and **K. subrubrum**. The former is resident in the locality of the site today, and is tolerant of a wide variety of water conditions. Unfortunately the material could not be identified to species.

FAMILY: Testudinidae

GENUS-SPECIES: **Gopherus** cf. **G. berlandieri** (Texas tortoise)

Referred Material: N506 E1008, Level 1; N507 E1009, Level 1; N508 E1012, Level 2; N506 E1013, Level 2; N507 E1013, Level 2; N509 E1012, Level 2; N500 E998, Level 13. Material consists of carapace and plastron scutes and two right scapulae.

Remarks: Most of the carapace and plastron fragments could only be identified to the level of genus. The right scapulae, one plastron fragment, and three carapace fragments have been tentatively identified as **G. berlandieri**. One of these carapace fragments is from Level 13. Of the two species of gopher tortoise which occur in the United States today, **G. berlandieri** prefers hotter and drier conditions than more eastern species.

FAMILY: Trionychidae

GENUS-SPECIES: **Trionyx** cf. **T. spiniferus** (spiny softshell turtle)

Referred Material: N504 E1012, Level 2; N504 E1013, Level 2; N505 E1012, Level 2; N505 E1013, Level 2; N504 E1011, Level 2; N505 E1010, Level 1; N505 E1011, Level 1; N504 E1008, Level 2; N504 E1009, Levels 1-2; N505 E1009, Levels 1-2; N504 E1014, Level 2; N506 E1009, Level 2; N507 E1008, Level 2; N507 E1009, Level 2; N506 E1011, Level 1; N507 E1011, Level 2; N508 E1008, Level 1; N508 E1009, Level 1; N506 E1013, Level 2; N508 E1013, Level 2; N509 E1012, Level 2; N509 E1013, Level 2. Material consists of carapace and plastron scutes, right femur, and left innominate.

Remarks: The spiny softshell turtle has the most easily identifiable shell scutes of any species of turtle, so even small fragments of shell can be identified. This may lead to a false impression that this species was found more frequently in the assemblage, when in fact it may only be that more fragments were identified. **Trionyx spiniferus** is found in the vicinity of the site today, so its recovery in Levels 1 and 2 is not particularly surprising considering the other aquatic species which have been recovered. What is surprising is that no fragments of this species were recovered below Level 2. Considering the

recognizability of the species this most likely is not a sampling error, nor that the species was overlooked. It does indicate that either the inhabitants were not taking the species, or that the species was not in the drainage system prior to the Late Prehistoric, or that the water source was not permanent enough to support the species. Since the fish remains have been recovered from Level 19, this last possibility does not seem feasible.

CLASS: MAMMALIA

ORDER: Marsupialia

FAMILY: Didelphidae

GENUS-SPECIES: **Didelphis** cf. **D. virginiana** (virginia opossum)

Referred Material: N504 E1008, Level 2. Material is the proximal end of the right ulna.

Remarks: Only one species of opossum occurs north of central Mexico so identification to species is reasonably certain, even though other species of **Didelphis** were not examined. It is interesting to note that arboreal, burrowing, and nocturnal species are markedly underrepresented in the faunal assemblage. This probably reflects human hunting preferences and abilities more than sampling error.

ORDER: Artiodactyla

FAMILY: Indeterminate (cloven-hooved ungulates)

Referred Material: N497 E997, Level 3; N499 E998, Level 3; N504 E1011, Level 1; N505 E1009, Level 1; N504 E1014, Level 2; N508 E1012, Level 1; N509 E1010, Level 1; N507 E1012, Level 1; N508 E1013, Levels 1-2; N509 E1013, Level 1; N510 E1020, Level 7; N490 E1043, Level 5; N491 E1043, Level 16; N499 E998, Level 10. Material consists of cranial, postcranial, and dental fragments, which could be deer, pronghorn, or collared peccary. These taxa are represented in the assemblage by more complete and identifiable remains.

Remarks: Of particular note is one vertebral element (N505 E1009, Level 1) which is from either a foetal or newborn animal. Since the preponderance of deer, pronghorn, and peccary young are born in the spring, the presence of this element in the assemblage suggests the site was probably occupied in the spring.

FAMILY: Antilocapridae

GENUS-SPECIES: **Antilocapra americana** (pronghorn)

Referred Material: N505 E1012, Level 1; N505 E1011, Level 1; N504 E1009, Level 2; N504 E1014, Level 2; N507 E1013, Levels 1-2. Material consists of a left maxillary fragment, isolated teeth, and a left humerus fragment.

Remarks: The pronghorn, though no longer found in the region today, was recorded in the area during historic times and has been recovered from other sites in south Texas. One deciduous fourth lower premolar with minimal wear was recovered (N505 E1014, Level 2). Since this tooth is erupted and in occlusion in most artiodactyls by the end of the first month (Gilbert 1980) its presence in the assemblage suggests a spring occupation of the site.

FAMILY: Bovidae

GENUS-SPECIES: **Bison bison** (bison)

Referred Material: N498 E996, Level 2; N498 E998, Level 3; N500 E997, Level 2; N505 E1008, Level 1; N506 E1009, Level 2; N507 E1008, Level 2; N507 E1011, Level 1; N508 E1008, Level 1; N507 E1013, Level 1; N508 E1007, Level 1; N509 E1007, Level 1; N491 E1044, Level 16. Material consists of isolated teeth, vertebrae, long bones, and bones of the feet. Material was recovered from Levels 1, 2, and 3 of the Late Prehistoric and Level 16 of the Middle Archaic.

Remarks: The difficulty in distinguishing fragmentary bison remains from domestic cow is a well-known osteological problem and is one that is not necessary to review here. It is sufficient to say that the identification to the taxon **Bison** is made on the basis of its prehistoric provenience.

The skeletal material present represents a rather heterogenous assortment of bones and teeth. Three isolated teeth were recovered as well as portions of long bones, vertebral fragments, and phalanges. Apparently these were but remnant bones which for reasons unknown were carried back to the site. There were, however, two collections of bone which represented several bones from two different individuals. A vertebra and several rib fragments were recovered from N507 E1013, Level 1, and these could represent the remains of a single animal. Another collection consisting of a proximal portion of the left ulna, a proximal portion of a left radius, and the distal portion of the left humerus all appeared to be from the elbow region of one animal (N508 E1007, Level 1). The animal was mature, based upon the complete fusion of the epiphyses, and appeared to be a female, based upon the small size of the

bones. These bones had also been burned. Another tibial fragment (N508 E1008, Level 1) had cut marks diagonal to the length of the diaphysis. Certainly, on the basis of the remains recovered it appears that bison did not represent a steady and reliable source of meat for the people at 41 LK 201. Even if all animals had been butchered away from the site one would expect a larger number of long bone fragments to be present in the bone assemblage.

One other point can be made about the bison remains recovered from the site, and this is whether the presence and absence of the bison remains fit Dillehay's (1974) model of population changes in bison during the late Quaternary. In an analysis of faunal remains from 160 archaeological and paleontological sites in the Southern Plains, Dillehay proposed that there were three periods during which bison were present on the Southern Plains and two periods during which they were absent, or scarce. Dillehay's proposed sequence is: Presence Period I (10,000 to 6000-5000 B.C.), Absence Period I (6000-5000 B.C. to 2500 B.C.), Presence Period II (2500 B.C. to A.D. 1-500), Absence Period II (A.D. 500 to 1200-1300), and Presence Period III (A.D. 1200-1300 to 1550). More recently, Lynott (1979) critiqued Dillehay's model and suggested that a more thorough review of data from more restricted areas might provide a clearer picture of bison populations through time.

As an example, Lynott reviewed the literature for north-central Texas and concluded that in general, bison remains were relatively rare in the region. On the basis of the remains which were present, however, he postulated that bison were most common during the Late Prehistoric from A.D. 1200 to 1600, and that prior to the Late Prehistoric time bison probably appeared as small scattered herds in the region. Unfortunately the paltry remains of bison at 41 LK 201 do not permit a clear resolution of the problem for south Texas. The bison remains were recovered from Level 16 dated at 840 to 820 B.C. and from Levels 1-3 which are dated as being deposited from A.D. 1470 to 1590 (dates are from Levels 2 and 3). The bison remains then, would fall within Dillehay's Presence Periods II and III which does not contradict his model. On the other hand, the presence of a sample of one distal phalanx from Level 16 does not contradict Lynott's model either. What is apparent is that it will take an unusually good sample of bison remains recovered (or not recovered) over a long period of time to resolve the issue.

FAMILY: Cervidae

GENUS-SPECIES: **Odocoileus virginianus** (white-tailed deer)

Referred Material: N491 E1042, Level 3; N491 E1044, Levels 2-4; N497 E997, Level 3; N497 E998, Levels 3-4; N499 E997,

Level 2; N499 E998, Level 4; N500 E996, Level 3; N500 E997, Level 4; N500 E998, Level 3; N505 E1013, Level 2; N504 E1010, Level 1; N504 E1011, Level 2; N505 E1011, Level 1; N504 E1008, Level 1; N504 E1009, Level 1; N505 E1009, Level 1; N505 E1014, Level 2; N507 E1009, Level 1; N508 E1011, Level 1; N509 E1011, Level 1; N508 E1009, Level 1; N509 E1008, Level 2; N509 E1009, Level 2; N506 E1013, Levels 1-2; N507 E1013, Level 1; N508 E1013, Levels 1-2; N509 E1013, Levels 1-2; N491 E1043, Levels 8-9, 15-16; N491 E1044, Levels 5-10; N497 E996, Level 5. Material consists of cranial, dental, antler, and postcranial fragments.

Remarks: All material assigned to this taxa could be identified to the level of genus (**Odocoileus**) on the basis of structural characteristics alone. The identification to the species **O. virginianus** is presumed since the only other species of deer within the state, **O. hemionus**, is restricted today to the Big Bend and High Plains region of the state.

Of the large sized identifiable animals represented at the site, the white-tailed deer is by far the most frequently recovered. This species also afforded the largest meat yield of any species represented. What cannot be determined is whether deer were harvested frequently enough to have provided a consistently reliable resource, or whether deer represented culinary highpoints in an otherwise meager existence.

The presence of butcher marks on two metapodial fragments (N504 E1011, Level 1 and N491 E1044, Level 4) provide direct evidence of human butchering of this species. The presence of cranial as well as a wide variety of postcranial elements indicates that the carcasses were brought back to the site whole for complete butchering and dismemberment.

A comment can also be made about the apparent random selection of age cohorts of the deer by the human hunters. Of the elements which were structurally indicative of age, one specimen was foetal (an unerupted deciduous premolar from N508 E1009, Level 1), two deer were under one year (a right maxillary fragment with deciduous premolars 1 through 3 from N491 E1044, Level 9; and an upper deciduous premolar fragment from N507 E1013, Level 1), one deer was subadult (a tibia epiphysis from N505 E1009, Level 1), and one deer was an old adult (a very worn third lower molar from N504 E1011, Level 2). Although this sample is too limited to provide irrefutable evidence, it does suggest that humans were taking deer irrespective of age, and that they were probably taking deer on an opportunistic basis.

Finally, the deer remains provide evidence as to when 41 LK 201 was occupied. The foetal remains and the remains of the deer less than one year old document at least a springtime

occupation, if not also summer. In addition to these remains, an unhardened antler fragment was found (N491 E1042, Level 3). If the fragment was crumbly because the deer was in velvet when it was collected (as I suspect), rather than being crumbly because of postmortem leaching and chemical erosion, then this specimen was most likely taken in the late summer.

FAMILY: Tayassuidae

GENUS-SPECIES: **Dicotyles tajacu** (collared peccary)

Referred Material: N497 E996, Level 4; N504 E1014, Level 2; N507 E1009, Level 1; N497 E997, Level 10. Material consists of left upper first incisor from Level 1, a humerus fragment from Level 2, a left calcaneus from Level 4, and two tooth fragments from Level 10.

Remarks: Davis (1974) lists the collared peccary as **Pecari tajacu**, but more recent systematic reviews list the collared peccary as **Dicotyles tajacu**, and this is the precedent followed here. Skeletal material of this species is quite distinctive, the postcranial material being possibly confused only with deer and pronghorn remains. The teeth, however, are easily distinguished from other artiodactyls. For the material reported here from Levels 1, 2, and 4, identification is positive. The material from Level 10 is based on tooth enamel fragments alone, however, and should remain tentative until additional materials are recovered from early deposits of this age.

The recognition that the collared peccary was part of the fauna of southern Texas during Late Prehistoric times is a relatively recent discovery. The first recovered faunal remains from southern Texas to be carefully examined did not include any identified remains of the collared peccary (Hester and Hill 1972, 1975; Hester 1975a, 1977). The sites examined were six from Zavala County (41 ZV 155, 41 ZV 60, 41 ZV H-11, 41 ZV 123, 41 ZV 14, and 41 ZV 152), one from Jim Wells County (41 JW 8), one from Dimmit County (41 DM 28), one from Medina County (41 ME 7), and one from Nueces County (41 NU 11).

Peccary remains have been recorded from Aransas County at the Johnson site, a predominantly Late Archaic occupation (Campbell 1947), but the specimen's provenience within the site was not recorded. A tooth of a peccary was also recovered at the Floyd Morris site (41 CF 2), but its provenience was suspect because of the disturbed nature of much of the site, and because a personal communication from Ernest Lundelius stated that peccary had ranged into the area only in very recent times (Collins, Hester, and Weir 1969). Based upon the lack of peccary remains from the sites examined

in the 1970s, Hester and Hill (1975) suggested that peccary was a relatively recent invader into southern Texas.

Recently, however, collared peccary remains have been identified from 41 LK 201, from new material recovered from 41 JW 8 (Steele n.d.), 41 MC 222 (Hall, Black, and Graves 1982; Steele and Hunter 1986), 41 NU 102 and 41 NU 103 (Steele and Mokry n.d.), and 41 LK 13 (Herman Smith, personal communication 1983). The tooth enamel fragments recovered from N497 E997, Level 10 at 41 LK 201 represent the first tentatively identified remains from known Late Archaic deposits. These more recent discoveries raise the questions whether the recently identified remains represent intrusive elements into the prehistoric deposits, or whether the spotty distribution of the remains in sites in southern Texas indicates that they were present in the past, but that the animals and their preferred habitat were more scarce than today.

For the remains identified by this author from 41 JW 8, 41 LK 201, 41 NU 102, 41 NU 103, and 41 MC 222 there was no indication that they should be considered intrusive. The remains were the typically broken remains associated with midden material, as were the rest of the faunal remains at these sites. Nor, did the bones show any differences in the pattern of staining, or the extent of leaching of the organic material present in the bone.

Similarly, there is nothing in the size of the animal or its habits that would suggest it to be a likely animal to be intrusive in the sites. The animal itself is not a burrower, and it is too large for most burrowing carnivores to drag its remains into a den dug into a site. Some of the canids could be large enough to drag remains of a peccary into a large burrow, but there was no evidence of gnawing on these remains to suggest that as a possibility. Another possibility for intrusion into the upper layers of the sites would be by plow disturbance. While this possibility cannot be ruled out, there have been no other faunal indications to suggest that plowing has added any amount of historical remains into the prehistoric levels. In summary, the author feels that the various lines of evidence support the conclusion that the remains of collared peccary at this site, as well as the remains at the other sites where the author has examined the remains, are in archaeological provenience.

If this conclusion is correct, the second issue raised is why are the remains not found in all sites? The data from Table 34 may help clarify this issue. Of the 181 elements of artiodactyls which could be identified to genus, only three were identified as **Dicotyles**. This represents less than 2% of the identified artiodactyl elements. If the same relative abundance of peccary remains occurred at other sites, then at least 100 artiodactyl elements identifiable to genus would

have to be recovered for any recognizable peccary remains to be found. Comparing the artiodactyl remains (181) to all of the remains recovered at the site (9650) illustrates how large a total faunal sample may be necessary to recover the remains of peccary.

Finally, the question can be raised as to why the peccary appears so infrequently within any one site, such as 41 LK 201. Schmidly (1977) noted that in the Trans-Pecos region of Texas the peccary is associated with a good growth of catclaw, mesquite, sotol, creosote bush, persimmon, and prickly pear. He further noted that their number has dwindled in the region as heavy grazing by domestic livestock reduced their forage and cover. Davis (1974) reported similar habitat preferences for the species. Based upon these observations, the definite presence of peccary in the Late Prehistoric and possibly Archaic would suggest patches of brush may have been present, but that this preferred habitat of the peccary was probably not as abundant as it is today. Hall, Black, and Graves (1982) have previously suggested that peccary remains at 41 MC 222 indicate the presence of thorny brush in the area, and the view of prairie broken by patches of woods is supported by early accounts for the region (summarized in Hester 1978).

ORDER: Carnivora

FAMILY: Canidae

GENUS: **Canis**

Species: Indeterminate (coyotes, dogs, and wolves)

Referred Material: N491 E1042, Level 1; N491 E1043, Level 3; N490 E1044, Level 7. Material consists of a scaphoid and tympanic bulla recovered from Level 1, a fourth premolar from Level 3, and a right tibia from Level 7.

Remarks: This genus includes the domestic dog, as well as coyotes and wolves. Distinguishing these species on skeletal or dental material can be extremely difficult, and usually tentative at best. For the material from this site the permanent fourth lower premolar (N491 E1043, Level 3) is the size of coyote or large dog, while the tibia fragment (N490 E1044, Level 7) is smaller than a coyote and possibly reflects evidence of domestic dog at this site during Late Prehistoric and possibly Late Archaic times. The evidence, however, is too tenuous to warrant allocating the fragment to that species.

FAMILY: Felidae

GENUS-SPECIES: **Felis** cf. **F. rufus** (bobcat)

Referred Material: N490 E1044, Level 6. Material is a left humerus fragment.

Remarks: Based upon the size, this humerus can be tentatively identified as the remains of a bobcat. The species is present throughout Texas today. This may represent the first record for this species during Late Prehistoric times, but it has been reported from near here during late Pleistocene times (Lundelius 1972).

FAMILY: Mustelidae

GENUS-SPECIES: **Taxidea taxus** (badger)

Referred Material: N504 E1012, Level 2; N491 E1043, Level 16. Material consists of a metacarpal and a right mandibular fragment recovered from Levels 2 and 16, respectively.

Remarks: The badger is a burrowing carnivore of the drier prairies and desert regions of Texas, occurring where their principal food, the ground squirrels and prairie dogs live (Davis 1974). They are present in the region today, and the material from Level 16 represents the oldest known record for this species in south Texas. Like the remains of the collared peccary, this species would lead one to presume a xeric condition existed at the site since the Middle Archaic. The presence of the pine vole and the muskrat, however, argue for a more mesic environment. It seems that this very mixture of southern, and presumably drier adapted species, and the northern, and presumably moister adapted species, has persisted during most of the Holocene in Texas.

FAMILY: Procyonidae

GENUS-SPECIES: **Procyon lotor** (raccoon)

Referred Material: N499 E996, Level 3; N500 E997, Level 3; N509 E1010, Level 3; N508 E1013, Level 1. Material consists of a right lower first molar, a complete hemimandible, a right lower canine, and a left lower canine.

Remarks: There are two genera of procyonids in Texas, the raccoon and the ringtail (**Bassariscus**). The former is distinguishable by its larger teeth and the distinctive fourth premolars. Like other nocturnal and arboreal species, the raccoon seems underrepresented in the sample.

ORDER: Edentata

FAMILY: Dasypodidae

GENUS-SPECIES: **Dasypus novemcinctus** (nine-banded armadillo)

Referred Material: N500 E998, Level 2. Material is a dermal scute.

Remarks: While the dermal scutes of armadillos are distinctive enough to provide a positive identification for the family, the assessment of the recovered material being the nine-banded armadillo is based on the fact that this is the only species known to have expanded northward from central Mexico. Because only a single scute has been recovered, it is highly possible that this represents an intrusive element from the surface or Level 1. The probability that the element is intrusive is supported by the assumption that if armadillos were present prehistorically their remains should be recovered more frequently since each armadillo dorsal shield is composed of several hundred readily identifiable scutes. The animal's burrowing habits also create conditions which enhance the possibility that its skeletal remains can represent intrusive elements in a site. On the other hand, if the provenience is valid, then this specimen represents one of the first records of armadillos having existed north of the Rio Grande during prehistoric times.

The first historical records of the nine-banded armadillo existing in the region are summarized by Humphrey (1974), Klippel and Parmalee (1984), and Smith and Doughty (1984). Benjamin Lundy described a captive animal seen in Matamoros in 1834 which fits the description of the armadillo. Viktor Bracht recorded the existence of armadillos east of the Rio Grande, close to Mexico in the late 1840s. And, James Audubon and John Bachman reported an informant's statements made in the 1850s that armadillos existed in the brush along the northern border of the Rio Grande and that their shells could be found eastward on the prairie. By the turn of the century, they were reported as far eastward as the Colorado River, and by the 1920s they were east of the Sabine River. South of the Rio Grande, Hall (1981) reported taxonomic records for the species in northern Mexico taken in the 1800s; the type specimen for **Dasypus novimcinctus mexicanus** reported in 1864 was taken from Matamoros.

The historical record then clearly documents the nine-banded armadillo's colonization of most of the state, and its existence along the Rio Grande and the northern Gulf coastal region of Mexico since the earliest naturalists' record of the region. The present archaeological record supports the historical record's documentation that the invasion north and east of the Rio Grande Valley is a recent phenomenon. The

proximity of the region between the Rio Grande and the Nueces River to the nine-banded armadillo's known northern range prior to the 19th century, however, makes the region particularly important for helping to establish the northern distribution of the species during prehistoric Holocene times. Consequently, archaeological records of the species from the region should be carefully examined rather than presume the elements are intrusive.

ORDER: Lagomorpha

FAMILY: Leporidae

GENUS-SPECIES: **Lepus** cf. **L. californicus** (black-tailed jackrabbit)

Referred Material: N490 E1043, Levels 4, 18; N491 E1043, Level 3; N492 E1042, Level 1; N492 E1043, Level 3; N497 E997, Level 4; N499 E996, Levels 4, 16; N499 E997, Levels 2, 4; N505 E1012, Level 1; N505 E1011, Level 2; N506 E1008, Level 1; N508 E1011, Level 3; N507 E1012, Level 2; N508 E1013, Level 2; N510 E1020, Level 6; N490 E1043, Levels 11, 13; N490 E1044, Level 10; N491 E1044, Levels 6, 10; N497 E997, Levels 10, 13-14; N498 E996, Level 11; N498 E998, Level 10; N499 E996, Level 16; N499 E997, Level 11; N500 E996, Level 11; N500 E997, Level 5. Material consists of cranial, dental, and post-cranial remains.

Remarks: While there are currently six species of jackrabbits recognized (Hall 1981), only the black-tailed jackrabbit has been recorded in Texas. When the material recovered from this site was compared with **Lepus townsendii**, a more northern and larger species of the jackrabbit, as well as the black-tailed jackrabbit, the recovered material was found to consistently compare favorably in size with the latter.

The black-tailed jackrabbit, a common inhabitant of the larger part of the southwest and southern Plains, appears to be limited to the north by intense winters and to the east by loss of prairie and scrubland. Like the badger and pronghorn, the presence of this species in the faunal assemblage documents the proximity of grassland to the site.

GENUS: **Sylvilagus**

SPECIES: cf. **S. audubonii** (desert cottontail rabbit)

SPECIES: cf. **S. floridanus** (eastern cottontail rabbit)

Referred Material: N497 E997, Level 4; N499 E997, Level 2; N500 E998, Levels 3-4; N505 E1013, Level 2; N505 E1010,

Level 1; N505 E1011, Levels 1-2; N505 E1008, Level 2; N505 E1009, Levels 1-2; N505 E1014, Levels 1-2; N506 E1009, Levels 1-2; N507 E1008, Level 2; N507 E1009, Level 2; N506 E1010, Level 1; N506 E1011, Level 1; N507 E1010, Level 2; N507 E1011, Level 2; N508 E1012, Levels 1-2; N508 E1011, Levels 1, 3; N509 E1010, Level 1; N509 E1011, Level 3; N508 E1009, Level 1; N509 E1009, Level 2; N506 E1012, Levels 1-2; N507 E1012, Level 1; N507 E1013, Level 2; N508 E1007, Level 1; N508 E1013, Level 2; N509 E1012, Level 2; N509 E1013, Level 2; N510 E1020, Levels 2-4; N490 E1043, Levels 3, 10-13, 18; N490 E1044, Levels 10, 12; N491 E1043, Levels 6, 8, 11-12; N491 E1044, Levels 7, 10, 12, 18; N497 E996, Level 11; N497 E998, Levels 10-11. Material consists of cranial, dental, and postcranial remains.

Remarks: Systematic reviews covering the mammals found in Texas differ as to their classification of cottontail rabbits. Davis (1974) recognizes four species in Texas: **Sylvilagus aquaticus, S. audubonii, S. floridanus,** and **S. robustus.** Hall (1981) recognizes **S. aquaticus, S. audobonii, S. floridanus,** and **S. palustris.** The differences are that Hall (1981) considers **S. robustus** as a subspecies within **S. floridanus,** separates **S. palustris** from **S. aquaticus,** and alters the spelling of the desert cottontail rabbit to **S. audobonii.** Schmidly (1977) follows Hall (1981) for the western species within the state but retains the previous spelling of **S. audubonii,** and this is the classification followed in this report.

In most cases, the material was assigned to the genus with no specific identification being made. Some remains could, however, be tentatively identified to species. **Sylvilagus audubonii** was identified on the basis of a right humerus (N505 E1011, Level 1), a left calcaneus (N506 E1012, Level 1), a left mandible (N490 E1043, Level 10), and a right tibia fragment (N497 E996, Level 11). **Sylvilagus floridanus** was tentatively identified on the basis of a left mandibular fragment (N505 E1011, Level 1) and an axis vertebra (N505 E1009, Level 1). Of the four species of cottontail rabbits recognized by Hall (1981) as existing in the state, they grade in size from **S. audubonii,** to **S. floridanus,** to **S. palustris,** to the largest, **S. aquaticus.** All of the species overlap in size, however, so distinguishing them on this criteria can only be tentative. Given these qualifications it is interesting to note that the two species currently indigenous to the region were recovered from Stratum 1 and that at least one of these species, **S. audubonii,** has also been recovered from a Late Archaic stratum.

Sylvilagus floridanus is a species typical of the eastern half of North America extending westward to the eastern slopes of the Rocky Mountains. **Sylvilagus audubonii,** on

the other hand, is a western species distributed from the Pacific Ocean to the western half of the Great Plains and Texas. The two largely allopatric species overlap in their ranges only along the western portion of the Plains and Texas. While both species prefer brushy habitats, Davis (1974) lists **S. audubonii** as also occupying grassland habitats. The tentative presence of **S. audubonii** in Levels 10 and 11 marks the earliest evidence of this western species in Texas, and may be a part of the grassland fauna also represented by the pronghorn, badger, and black-tailed jackrabbit.

One of the fragmentary remains of a left humerus (N491 E1043, Level 8) was from an immature specimen. While this documents the humans taking subadults as well as adults, it does not indicate a particular season of occupation, since Davis (1974) states that **S. floridanus** has a year-long breeding season in south Texas today.

ORDER: Rodentia

FAMILY: Heteromyidae

GENUS-SPECIES: **Liomys** cf. **L. irroratus** (Mexican spiny pocket mouse)

Referred Material: N500 E998, Levels 2-3, 11. Material is three mandibular molars.

Remarks: **Liomys** is a Middle American genus with only **L. irroratus** occurring as far north as south Texas in recent times. Like the nine-banded armadillo and the collared peccary, this species is thought to have only recently expanded northward. The material recovered from Level 11 represents the oldest identified material for the genus in North America.

GENUS-SPECIES: **Perognathus** cf. **P. hispidus** (hispid pocket mouse)

Referred Material: N500 E998, Level 2. Material is left maxillary fragment containing first through the third molars.

Remarks: Davis (1974) lists eight species of pocket mice in Texas, while Hall (1981) recognizes only six species. Of these, **Perognathus hispidus** and **P. pencillatus** are the two largest and most comparable in size to the recovered specimen. **P. pencillatus** is known only from the Trans-Pecos region of Texas, while **P. hispidus** occurs throughout Texas and extends northward through most of the Great Plains of the United States. Davis (1974) states that this species prefers sandy

soils with scattered to moderate grass cover, which again suggests the humans were hunting grassland habitats near the site.

FAMILY: Muridae

GENUS-SPECIES: **Baiomys** cf. **B. taylori** (pygmy mouse)

Referred Material: N500 E998, Level 6. Material is left upper first molar.

Remarks: **Baiomys taylori** is the smallest mouse in Texas and is easily distinguished by the structure and size of the teeth. It is found in Live Oak County today, although this appears to be the westward extent of its range. Based on the species current distribution in the central third of the state, the species appears to be limited in its distribution by very dry and very moist conditions.

GENUS-SPECIES: **Microtus** cf. **M. pinetorum** (pine vole)

Referred Material: N500 E998, Levels 8, 11. Material consists of isolated molars.

Remarks: The pine vole can be distinguished from most of the other voles by its smaller size, and the smaller size of the anterior loop on the molars. It is possible, however, that the recovered specimens could be **M. ochrogaster**, the other species of **Microtus** which has been found in Texas during historic times. The pine vole, predominately found in the northeastern portion of the United States extends southwestward into the Texas Hill Country. The prairie vole (**M. ochrogaster**) is also a predominately northeastern species, but southern populations have been recorded for Louisiana and east Texas (Schmidly 1983). The pine vole has been recovered from Pleistocene and Holocene deposits in Goliad County (Brown 1983), Kerr County (Roth 1972), Hill County (Jelks 1962), Montague County (Dalquest 1965b), and Travis County (Lundelius 1974). The prairie vole has been recorded from archaeological deposits in San Patricio County (Raun and Laughlin 1972), although this identification was based upon the proximity of the recorded range of **M. ochrogaster** rather than structural features present in the specimen. The material recovered at 41 LK 201 would represent the southernmost record for either species in Texas. Lundelius (1974), in discussing the retreat northward of some of the rodents in the face of the climatic changes of the Holocene, points out that for some species this reduction in their distribution has not been an even process. Both the central Texas population of the pine vole and the Louisiana, and possibly east Texas, population of the prairie vole are examples of such relict populations surviving in

locally favorable habitats. What is most interesting is that the retreat northward of these species may have been a much more recent phenomenon than has been previously suspected.

GENUS: **Neotoma**

SPECIES: Indeterminate (wood rat)

Referred Material: N490 E1043, Level 13; N491 E1043, Levels 11-12; N491 E1044, Level 10; N498 E998, Level 4; N499 E996, Level 4; N500 E998, Levels 5, 15; N504 E1009, Level 2; N505 E1008, Level 1; N506 E1009, Level 2; N507 E1008, Level 2; N507 E1009, Level 1; N507 E1011, Level 2: N508 E1012, Level 2; N508 E1010, Level 1; N509 E1010, Level 1; N509 E1011, Level 1; N508 E1008, Level 1; N508 E1009, Level 1; N507 E1012, Level 1; N509 E1012, Level 1; N509 E1013, Levels 1-2; N510 E1020, Levels 2-3; N506 E1013, Level 1; N508 E1013, Level 1. Identified material consists of representation of all of the long bones, pelvic and scapular fragments, and isolated teeth.

Remarks: Both Davis (1974) and Hall (1981) recognize four species of wood rat as currently indigenous to the state. Two of these are medium size, **Neotoma albigula** and **N. mexicana;** and two of these are large, **N. floridana** and **N. micropus.** Size is the only apparent feature distinguishing these species skeletally. Therefore, most of the referred material could only be identified to the genus. However, two mandibular fragments (N491 E1043, Level 11 and N506 E1013, Level 1) were tentatively identified as belonging to one of the two larger species, **N. micropus** or **N. floridana.** Additionally, one mandibular fragment (N508 E1013, Level 1) was tentatively identified as one of the smaller species, either **N. albigula** or **N. mexicana.** Today only **N. micropus** is indigenous to Live Oak County, but **N. micropus** and **N. albigula** are sympatric over much of the western portion of the state, and occur sympatrically as far south as Bandera County. On the other hand, **N. floridana** and **N. albigula** may be sympatric only limitedly today (Davis [1974] lists both species as occurring in Edwards County alone). Unfortunately, the **Neotoma** species distribution only tantalizingly suggest different environmental conditions in the past until we are better able to distinguish them skeletally.

GENUS-SPECIES: **Ondatra zibethicus** (muskrat)

Referred Material: N492 E1042, Level 3. Material is the left femur.

Remarks: The specimen recovered is that of an immature individual of less than one year. **Ondatra zibethicus** has an incredibly wide distribution in North America extending from

the Arctic Circle southward into north and west Texas. Additionally, an isolated population is found along the upper Gulf coast of Texas which extends eastward through to western Florida. Within Texas, the species is not found at present in the Hill Country nor in south Texas (Hall 1981). Therefore, the specimen found in Live Oak County represents a southern record for the species in south Texas. What cannot be determined is whether this represents a southern extension of the muskrat population of the Great Plains, or whether it represents a western extension of the Gulf coast population. In either situation, the presence of muskrat at the site suggests the proximity of stable riverine or lacustrine environments.

GENUS: **Peromyscus**

SPECIES: Indeterminate (white-footed mice)

Referred Material: N508 E1012, Level 2. Material recovered is a left mandible.

Remarks: Of the wild mice **Peromyscus** is one of the most diversified and abundant genera in Texas with as many as nine species represented (Davis 1974). Within the general vicinity of the site at least three species exist today: **P. maniculatus, P. attwateri,** and **P. pectoralis.** The mandibular fragment recovered could not be assigned positively to any of these species. Because of the ubiquity of the genus, this taxon provides little information for reconstructing past environments or documenting past human hunting patterns.

GENUS: **Reithrodontomys**

SPECIES: Indeterminate (harvest mice)

Referred Material: N490 E1043, Level 12; N500 E998, Level 7. Material consists of a left maxillary fragment with the first and second molar from Level 12, and a worn right first maxillary molar from Level 7.

Remarks: Hall (1981) recognizes four species of harvest mice currently in Texas: **R. fulvescens,** which occurs in the site area; **R. megalotis,** which occurs only in west Texas; **R. humulis,** which occurs only in east Texas, and **R. montanus,** which occurs over much of the state today but not in the immediate area of the site. These mice, however, are all similar in size, so it was impossible to make a positive identification of the recovered material.

GENUS-SPECIES: **Sigmodon** cf. **S. hispidus** (hispid cotton rat)

Referred Material: N505 E1009, Level 1; N507 E1008, Level 1; N507 E1009, Level 1; N508 E1010, Level 1; N506 E1012, Level 1; N509 E1012, Level 2; N500 E998, Levels 2-10, 12-13, 15, 17; N490 E1043, Levels 8, 11-13, 18; N490 E1043-1044, Level 16. Material consists of mandibular fragments, isolated teeth, and two innominate fragments.

Remarks: The teeth of the genus **Sigmodon** are very distinctive, facilitating identification to this level. Only two species are found within Texas, **S. hispidus** which is ubiquitous throughout the state and **S. ochrognathus** which is restricted to the higher elevations of the Chisos Mountains in the Big Bend region. Since the hispid cotton rat can tolerate such a diversified range of habitats the species is not particularly valuable as an indicator of past environments. It is noteworthy, however, that the species prefers heavily grassed and well-drained areas, which suggests the inhabitants of 41 LK 201 were actively harvesting the prairies as well as the riverine and lacustrine environments. It should also be noted that this species is one of the best represented in the assemblage, being found in virtually all stratigraphic levels.

FAMILY: Sciuridae

GENUS: **Sciurus**

SPECIES: Indeterminate (squirrels)

Referred Material: N491 E1043, Level 4; N500 E998, Levels 3, 7-8; N491 E1044, Level 8. Material consists of isolated teeth, right innominate, and an axis vertebra.

Remarks: Davis (1974) recognizes 10 species of squirrels resident in Texas, including ground squirrels, tree squirrels, chipmunks, and prairie dogs. Of these, two species of ground squirrel (**Spermophilus mexicanus** and **S. spilosoma**) and one species of tree squirrel (**Sciurus niger**) are reported from Live Oak County. Additionally, the rock squirrel (**Spermophilus variegatus**) and the black-tailed prairie dog (**Cynomys ludovicianus**) exist today just north of the county. Given the availability, or the potential availability of this family of rodents, it was surprising that so few squirrel remains were found. Certainly the inhabitants of 41 LK 201 were hunting rodents in both the grass prairies and the riverine environments where squirrel species live, and, because of the relatively large size of these rodents, one would expect that they would have been sought. If the low prevalence of squirrel remains at the site indeed reflects their meager importance in the diet of the humans, it may be that the arboreal and burrowing

habits of these species made them difficult prey to capture.

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APPENDIX VI.

THE VALUE OF FINE SCREENING ON INLAND BASED HUNTER-GATHERER HABITATION SITES

Gary B. DeMarcay and D. Gentry Steele

INTRODUCTION

One of the main concerns of a zooarchaeologist is to determine the quality of the sample being analyzed. Are the samples fair reflections of what was present in the site? Do we know how the recovered samples were deposited: i.e., which forces arranged the samples and which forces shaped the samples after they were assembled?

Prior to the 1960s emphasis was placed on the recovery of lithic and ceramic artifacts. This was partially due to the archaeologist's preoccupation with establishing regional chronologies (Willey and Sabloff 1980) and partially the lack of qualified personnel to analyze other aspects of the material culture (Robison 1978). At this time faunal assemblages were given second class status, and little effort was made to understand the forces which developed them (Daly 1969:146). One particular problem area concerned how the sample was recovered. Prior to the 1960s faunal samples were often collected by hand sorting, with only items large enough to be easily separated from the surrounding matrix collected. This resulted in both badly biased samples and incomplete information on diet and seasonality (Casteel 1972). As an example, at Suberde, Turkey, hand sorting led to a collection biased towards the large parts of the skeleton, resulting in inaccurate interpretation of butchering techniques (Payne 1975). More dramatically, Casteel (1972:383) found that hand sorting led to the loss of 100% of all fish remains at a site along the northwest coast of North America.

The apparent answer to this problem is to screen the excavated materials. In Florida, screening the matrix through a series of coarse and fine screens produced an increase in the number of marine species recovered at a coastal site (Wing and Quitmyer n.d.:5). Another study, on a Louisiana coastal site, showed that fine screening produced an increase in the number of individuals recovered (de France n.d.).

There is a problem, however, with screening. While fine screening increases the amount of material collected and is generally recommended (Hester, Heizer, and Graham 1975; Fladmark 1978; Hester 1980), it also increases the cost of a project. Payne (1975:16) found that water screening quadrupled the cost of excavating a trench at Suberde, Turkey. With the increase in artifacts recovered, the amount of time allocated to analysis also has to be increased, which further raises the cost of the project. This has led researchers to consider microscreened samples to be of secondary importance and to either delete the analysis of fine-screened fauna altogether, or to eliminate the fine screening of matrix for faunal remains.

During the course of analysis of the faunal remains at 41 LK 201, it was decided to use this site to test the need for fine screening inland based hunting and gathering habitation sites. Casteel (1972) and Wing and Quitmyer

(n.d.) have documented the value of fine screening at coastal sites, and Payne (1975) documented the value of fine screening at Old World village sites containing domestic fauna. Few researchers, however, have documented the value of fine-screening matrix from inland based hunting and gathering societies in North America. In addition to determining if fine screening increased the quality and quantity of the sample, the authors attempted to evaluate the costs of analyzing fauna recovered from fine screening, and to provide guidelines for effectively collecting microsamples and analyzing these samples from inland hunting and gathering sites.

METHOD AND SAMPLE

Site 41 LK 201 is located along the west bank of an unnamed wash, in Choke Canyon in south-central Texas. Choke Canyon is located on the gently rolling Rio Grande Plain, a subdivision of the West Gulf Coastal Plain. The climate is described as semiarid, with short mild winters and long hot summers (Hall, Black, and Graves 1982:3). Site 41 LK 201 is a habitation site reoccupied intermittently by hunters and gatherers during the Middle and Late Archaic through Late Prehistoric times. The inhabitants lifeways resembled those of the historic Indians occupying the Texas coast which have been described by Newcomb (1961), Campbell (1975), and Campbell and Campbell (1981).

In recovering artifactual material from 41 LK 201 a procedure utilizing screens of two different mesh sizes was used. These screens were of 1/4-inch mesh (coarse screen) and 1/8-inch mesh (fine screen). Both categories of material were identified using the comparative collection available in the Anthropology Department, Texas A&M University. A binocular microscope was used to sort and identify the fine-screened material.

Sixty-four 2-m^2 units were excavated to varying depths. From these test pits two excavation units were chosen for comparison. Both of these units (N490 E1043 and N500 E998) contained fine- and coarse-screened materials. A total of 13,671 bones was recovered from these two test pits. These consist of 2120 bones recovered from the macroscreen and 11,551 bones from the microscreen. The coarse-screened material consisted of faunal remains found only in the 1/4-inch mesh screen. The fine-screened material was found in both the 1/4-inch and 1/8-inch mesh screens. The reason for combining the coarse and fine screen material under the fine-screened category was that if only a single 1/8-inch screen had been used the same amount of material would have been recovered.

The samples were analyzed in several different ways. First, they were compared on the basis of identified to unidentified bones. Second, the nature of the identified bones for mammals was determined. This was done by comparing the different body parts recovered. Next, the number of genera recovered from the two screens was compared. The fourth phase of analysis was to determine the frequency of small mammals to larger mammals.

One commonly used comparison of faunal remains was not used in this paper. This is the Minimum Number of Individuals (MNI) method. Several other studies have demonstrated that in samples showing such a wide disparity in

the size of elements, MNI is considered to be inadequate (Casteel 1977; Grayson 1978).

ANALYSIS

The two samples were first compared on the basis of unidentified to identified bones (Table 38). This was done to see whether use of the 1/8-inch mesh screen only increased the number of unidentified bones recovered. If this were the case, then the value of using the fine screen would decrease.

In Unit N500 E998, a total of 9039 bones was recovered, 1215 bones from the coarse screen and an additional 7824 bones from the fine screen. The coarse screen materials consist of 97% unidentified remains. When the fine screen sample is added to the coarse screen materials, the percentage of unidentified bone decreases to 96%.

When both units are considered together, 96% of the coarse-screened material was unidentified. For the combined fine-screened material the percentage of unidentified bone drops to 95%.

It can be seen that the percentage of identified bone increases with fine screening. This indicates that a significant portion of the identifiable assemblage would have been lost if only a 1/4-inch screen had been used. It is also clear that for both samples the amount of identified to unidentified bone is still low. This high percentage of unidentified bones and the corresponding low percentage of identified bones is indicative of a non-biased sample, according to Payne (1975:14).

The second phase of analysis was to determine the nature of the identified material. In the comparison of body parts recovered (Table 39), only mammals were considered. This was done, primarily, because mammal bones represented the majority of the identified faunal remains.

Table 39 is broken down into three types of body elements, cranial, dental, and postcranial. Only those elements which could be identified at least to order are included in this table. The cranial elements consisted mostly of mandibles and maxillary fragments. These were not included under the dental category on Table 39.

A total of eight cranial elements was recovered from both units. These represent 3% of the recovered, identified mammalian material. Only three cranial elements were recovered from the coarse-screened material. This represents 12% of the recovered, identified, mammalian, coarse-screened material. When the fine-screened material is added, the frequency of cranial parts decreases to 3%. A possible reason for the low frequency of identifiable cranial elements relates to their fragile nature. It is also possible that the screening process further reduced some elements into unidentifiable fragments.

A total of 173 identifiable teeth was recovered in both screens from the combined units. Teeth represent 25% of the coarse-screened mammalian material. The overall frequency of dental elements rises dramatically,

TABLE 38. FREQUENCY AND AMOUNTS OF IDENTIFIED AND UNIDENTIFIED BONES

	Count of Unidentified Bone	Percentage of Unidentified Bone	Count of Identified Bone	Percentage of Identified Bone
Unit 490 E1043				
Coarse screen	861	95	44	5
Coarse screen + fine screen	4280	92	352	8
Unit N500 E998				
Coarse screen	1183	97	32	3
Coarse screen + fine screen	8651	96	388	4
Combined Units				
Coarse screen	2044	96	76	4
Coarse screen + fine screen	12,931	95	740	5

TABLE 39. OCCURRENCE OF CRANIAL, DENTAL, AND POSTCRANIAL ELEMENTS

	Cranial		Dental		Postcranial	
	Count	Percentage	Count	Percentage	Count	Percentage
N490 E1043						
Coarse screen	3	15	1	5	15	79
Coarse screen + fine screen	5	5	52	51	44	44
Unit N500 E998						
Coarse screen	0	0	5	42	7	58
Coarse screen + fine screen	3	2	121	77	33	21
Combined Units						
Coarse screen	3	12	6	25	15	79
Coarse screen + fine screen	8	3	173	67	77	30

however, when material from both screens are considered. Of the total recovered mammalian sample, 67% consist of teeth. The majority of these were classified within the order Rodentia.

Seventy-seven of the identified postcranial elements were recovered from fine screens from both units. This represents 30% of the recovered mammalian material. In the coarse-screened material, postcranial elements represent 62% of the mammalian material recovered. Though the number of postcranial bones increases in the fine-screened sample, their frequency in the overall sample drops to 30%.

Several conclusions can be drawn from the data presented in Table 39. The first is that a coarse-screened sample at the site misses a disproportionate number of cranial and dental elements. The second is that these missed elements represent the remains of smaller animals. This biased sample could underestimate the abundance of microfauna at the site. The higher frequency of cranial and dental elements helps to confirm that different sized fauna were butchered and consumed differently. For example, the absence of bison teeth indicates that bison were butchered and the heads removed off site. The presence of deer (**Odocoileus** sp.) teeth and antler indicates that at least some deer were brought back to the site with the head intact. The high percentage of rodent teeth recovered in the 1/8-inch mesh screen indicates that they were generally brought back to the site with only minimal butchering. It is not known whether the rodents were consumed whole or were decapitated prior to eating. Evidence presented by Stahl (1982:824) indicates two methods of rodent consumption: eating the animal whole or pulverizing the animal, then eating the bone separately, or with muscle tissue attached.

The next phase of analysis was to determine if more genera were recovered in the fine-screened sample. This would indicate small but identifiable taxa are recovered using the 1/8-inch screen. For this test, once again, the mammal taxa were examined because of their greater frequency.

As can be seen in Figure 48, the use of 1/8-inch mesh screen increases the number of genera recovered of the class Mammalia. The genera found only in the fine screen are all rodents: **Perognathus, Baiomys, Microtus,** and **Reithrodontomys.** Genus **Sigmodon** occurs infrequently in the coarse screen sample, but frequently in the fine screen sample.

Of the four genera limited to the fine-screened sample, **Perognathus, Reithrodontomys,** and **Baiomys** are found in the area today. The remaining genus **Microtus** is not. This rodent has been identified as **Microtus** cf. **M. pinetorum** (pine vole). Its habitat according to Davis (1974:224) is in woodland areas, where they can burrow just beneath the leaf litter. Today they are rarely, if ever, recovered further south than localized habitats in the central Texas Hill Country. **Microtus** was identified on the basis of several teeth found in the Late Archaic levels at 41 LK 201. Its presence may indicate that the climate may have been less arid during the Archaic period or that a wetland habitat suitable for **Microtus** was available.

It can be concluded then that the fine-screened sample provides a larger inventory of small mammals, particularly rodents. This increased number of

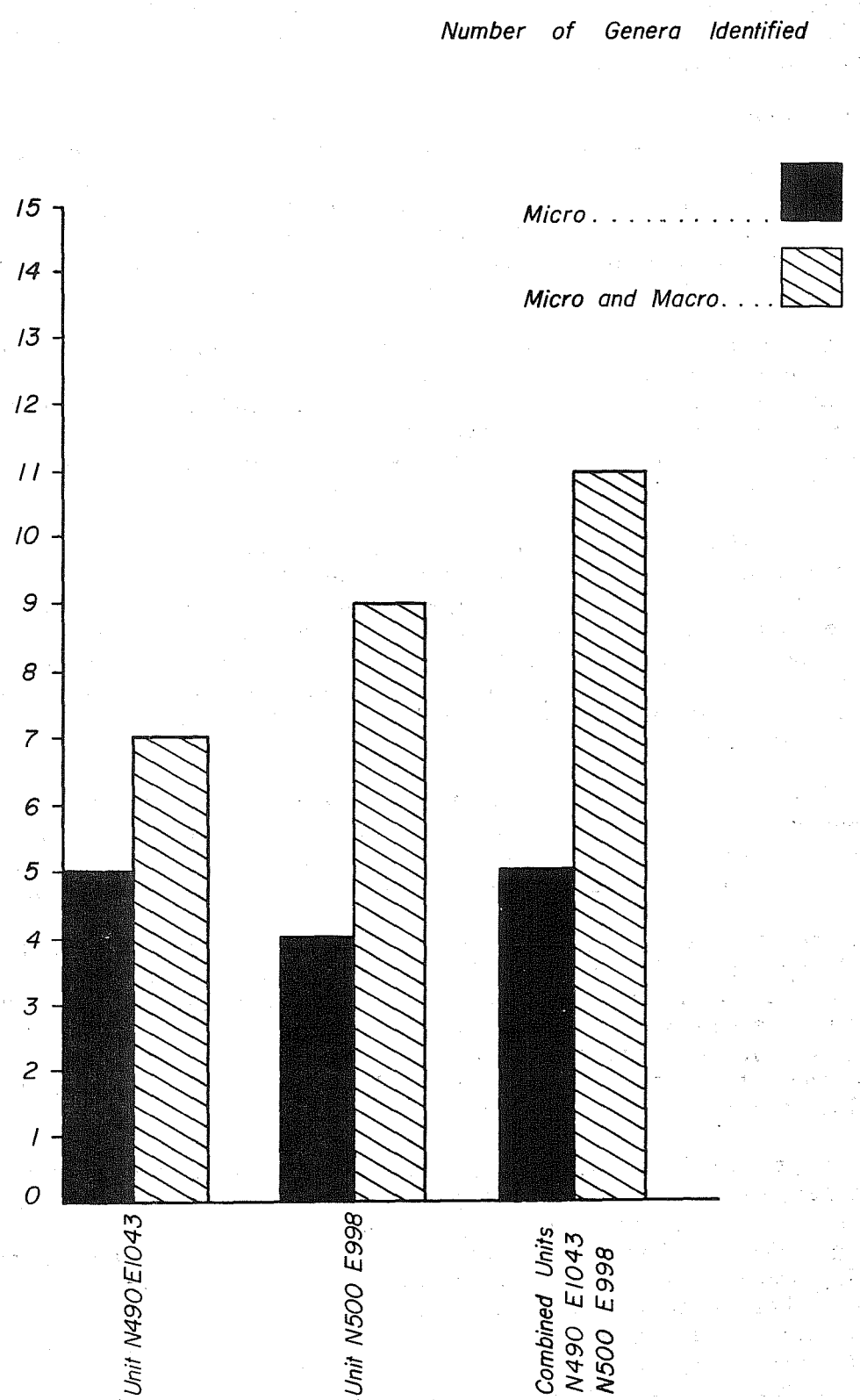

Figure 48. **Number of Genera Identified.**

genera helps expand our understanding of the prehistoric subsistence economy, and is also helpful in providing additional information about environmental change in south-central Texas.

The next phase of analysis was to see if there was a difference in the frequency of classes recovered between the coarse and fine screens. As can be seen in Figure 49 remains of the class Aves represent a higher portion of the coarse screen sample. As with the cranial elements, it is possible that the bones of this class did not survive in a recognizable form in the 1/8-inch screen sample because of their fragile nature. It is also possible that humans exploiting this resource concentrated on the larger species of birds.

Class Reptilia is also found more frequently in the coarse-screened material. It is possible that as with class Aves, utilization concentrated on the larger members, such as those of turtles (Testudines) and larger snakes (Serpentes). Additionally, in respect to the order Serpentes, it is possible that the bones of some species are too small to be recovered consistently using screens of 1/4-inch and 1/8-inch mesh size.

The frequency of class Osteichthyes (fish) increases when the fine screen sample is added to the coarse-screened material. This was anticipated by Casteel's (1972) and Wing and Quitmyer's (n.d.) studies. The remains found in the 1/8-inch screen consist of scales and vertebrae of minnow-sized fish. Their presence at Choke Canyon indicates the use of nondiscriminatory fish killing techniques, such as poisoning or the use of nets. Again, reliance on the coarse-screened sample alone would result in an incomplete view of subsistence practices.

As with class Osteichthyes, class Mammalia also shows an increase when the fine-screened material is considered. As previously mentioned, most of the additional genera found in the fine-screened sample were classified as rodents. This will be discussed at greater length later in this section.

The next step in analysis was to compare the frequency of small mammals to that of larger mammals (Figure 50). We were particularly interested in answering the following question. Does recognition of the relative importance of small mammals increase with the addition of the fine screen? This is particularly important in south-central Texas, since it has been suggested that there was a shift from small mammals to larger mammals through time (Hall, Black, and Graves 1982:471).

Order Artiodactyla's highest frequency of occurrence was in the coarse-screened sample. This is to be expected when the size of the individual members is taken into consideration. The presence of the order Edentata, recovered only in the fine-screened sample, is somewhat surprising, considering its possibly recent migration into the American Southwest (Davis 1974:267). Its presence in Level 2 and its low occurrence (one scut) may indicate that it is intrusive and is not associated with the prehistoric component. Order Lagomorpha occurs most frequently in the material recovered from the coarse screen. The element most often identified was the teeth of the genera **Sylvilagus** and **Lepus**. It should be noted that teeth from small mammals occur infrequently in hand-sorted samples. The high percentage of

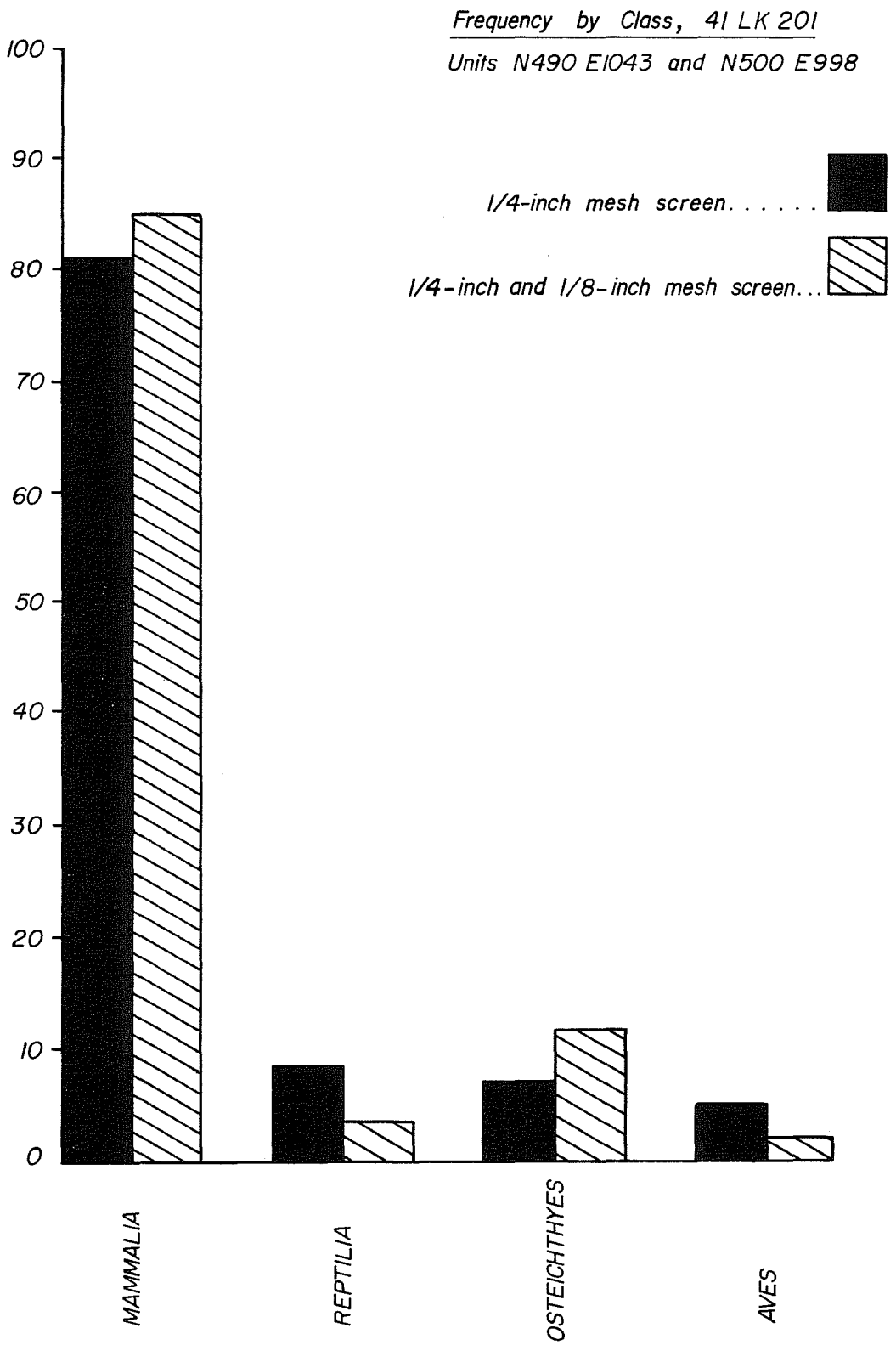

Figure 49. **Frequency of Occurrence By Class.**

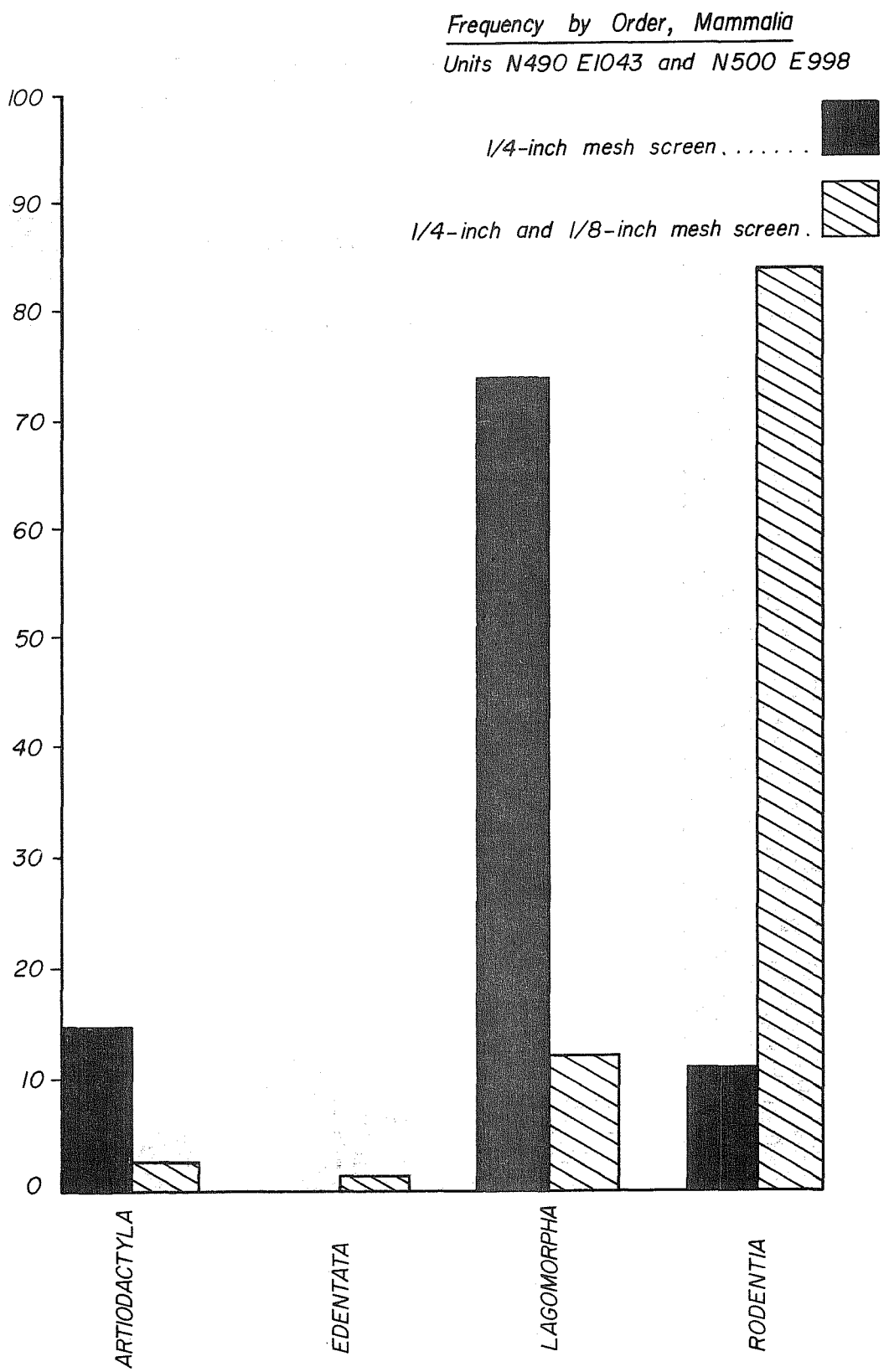

Figure 50. **Frequency of Occurrence by Order of Mammalia.**

Lagomorphs indicates that they may have been a common food source, certainly more common than the larger Artiodactyla.

The order Rodentia is the most frequently occurring animal at 41 LK 201. But the importance of this potentially important food source would have probably been missed entirely if the recovered material had been hand sorted. If a single coarse screen of 1/4-inch mesh had been used, the frequency of rodents would have declined from 89% to 10%. Several points can be made about the relative importance of larger mammals to small mammals. The use of the coarse screen only, would have shown that small mammals were more common than larger mammals, but would have suggested a greater reliance on large mammals. Additionally, use of only the coarse screen would have led to the misconception that rabbits were the most frequently utilized small mammal resource. Use of the fine screen demonstrates that rodents were at least equally important as rabbits, and the combined high frequency of rabbits and rodents may have played a much more important role in the prehistoric subsistence economy than the larger mammals.

The evidence of the use of small mammals in the aboriginal diet is well documented in the ethnographic literature (Stahl 1982:826). According to Stahl (1982:823) small mammals have a high ratio of edible meat to live weight, and their availability make them potentially important elements in the subsistence strategy. Direct evidence of their use as a food item, prehistorically, in Texas comes from Caldwell cave, Culberson County (Holloway 1984) and Hinds cave, Val Verde County (Williams-Dean 1978; Stock 1983), where rodent bones were found in human coprolites. It is only with fine screening that you can consistently document the importance of these small animals in human diets at other sites.

DISCUSSION AND SUMMARY

Prior to the present analysis it had been recognized that the types of information gained from fine screening generally related to questions concerning subsistence and environmental change (Guilday 1967; Lundelius 1967; Parmalee 1968). An example of a subsistence study enhanced by the analysis of the fine-screened sample was Wing and Quitmyer's (n.d.) study, where they found that on coastal sites in Florida screening through a single coarse screen suggested an economy based on the gathering of shellfish and hook and line fishing. When the materials were also sieved through a fine screen, the emphasis changed to fishing with small gauge nets.

The present research has documented that for inland hunting and gathering sites, fine screening also increases our understanding of these inhabitant's economy. At 41 LK 201, analysis of material recovered from the fine screen has clearly documented the importance of small game, both mammals and fish. Additionally, the recognition of small fish remains indicated a different harvesting pattern for these vertebrates (i.e., poisoning, netting, or driving) than was indicated when only the coarse screen sample was considered.

Recovery of remains of **Microtus** from the fine-screened sample provided a different picture of the faunal community than was previously supposed. The

presence of **Microtus**, no longer found in the area, suggested that the region surrounding the site during the period in which it was occupied contained a more varied fauna than today. This fact in turn, may have implications for paleoenvironmental reconstructions (Steele 1986).

While we have documented the definite improved quality and quantity of the sample when microscreening is undertaken at sites similar to 41 LK 201, the major problem with the recovery of faunal remains from fine screen is that it increases the time (and therefore the cost) of excavation and analysis. For instance, for the sample from 41 LK 201, it required approximately 288 person hours to analyze the microfauna from two of the 64 units. An additional undetermined number of person hours was required to recover the fine-screened sample at the site. The problem then becomes, determining when it is necessary to fine screen, how much material should be fine screened, and how much should be analyzed.

The answers to these cost benefit problems can be solved in several ways. All sites may not need to be screened. Clason and Prummel (1977:173) found that screening did not change information about subsistence from a village site in Yugoslavia where domesticated animals provided the major meat portion of the diet. Similarly, sites where data indicates that neither fish nor small mammals represent a significant part of the assemblage may not need to be extensively fine screened. For example, specialized sites, where the only activity taking place was the killing or butchering of large animals, may not require extensive screening. Other factors can lead to a determination not to use screens. Some soils are so acidic that bone recovery is minimal under any circumstances. Clayey soils, where water for screening is not available, may be too compacted to fine screen. Dry screening these soils can lead to the destruction, during the screening process, of the very bone that is being sought.

On the other hand, some sites should always be microscreened. Sites occupied by hunters and gatherers, whether they are found along waterways or inland, should be suspected of containing small fauna, and therefore should be fine screened. Sites where paleoenvironmental reconstruction is a major problem orientation of the project should also be fine screened. For these types of sites, since the analysis of a fine-screened faunal assemblage will be an integral part of the project, adequate funding should be anticipated.

For sites where microscreening is necessary, there are some general guidelines which can be followed. The first would be to use the mesh size most practical at the site. If water screening at the site is practical, or if the solid matrix is unconsolidated, then a mesh of 1/8-inch (3 mm) may be used for all matrix moved at the site. For sites where these conditions may not make it possible or feasible to screen all matrix through such a fine screen, then a plan should be developed to fine screen selected portions of the matrix moved at the site. Depending upon the size of the area exposed, the project director may choose to randomly select portions of the site to be microscreened, or the project director may choose to microscreen a specific fraction of each square excavated. Often consultation with the zooarchaeologist can help to determine the most advantageous and effective sampling procedure.

In addition to microscreening all, or selected portions of a site, it may prove fruitful to collect smaller unscreened column samples of matrix to be later screened under laboratory conditions. Casteel (1972) advocated this method when he found it particularly useful for recovering small fish remains from a northwest coastal site. For inland sites, particularly in Texas, such a sampling technique may prove necessary for collecting the smaller gastropods.

In conclusion, the analysis of fine-screened faunal remains has been shown to provide significantly more data about the lifeways of people at 41 LK 201, and the environment in which they lived. Extrapolating from this example, it is suggested that matrix from other similar sites should also be fine screened so that the analysis of faunal remains can be based upon material more representative of what was preserved at the site.

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APPENDIX VII.

GENERAL DATA TABLES

MATERIAL ANALYSIS RECORDS

KEY TO COLUMN ENTRIES FOR PARTS I AND II.

SITE - The site number, 41 LK 201.

NORTH/EAST - Grid coordinates for southwest corner of excavation unit.

LEV - Vertical level in excavation unit starting with surface level (1) and proceeding downward. Most levels are 10-cm thick; Units N510 E1020-1022 were excavated in 5-cm levels.

A - Tuff weight, in grams

B - Sandstone weight, in grams

C - Fire-fractured rock weight, in grams

D - Mussel shell umbo count

E - Mussel shell weight (umbos and fragments), in grams

F - **Rabdotus** count

G - Bone weight, in grams

H - Marine shell count

I - Aboriginal ceramic count

J - Biface count

K - Grinding slab fragment count

L - Mano count

M - Grooved abrader count

N - Gypsum rod count

O - Core count

P - Primary flake total

Q - Secondary flake total

R - Tertiary flake total

SITE	NORTH	EAST	LEV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
LK201	490	1044	19	64	0	23	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
LK201	491	1042	1	4	0	0	1	1	14	1	0	0	0	0	0	0	0	0	0	0	0
LK201	491	1042	2	0	47	19	3	26	90	12	0	0	0	0	1	0	0	0	0	0	5
LK201	491	1042	3	5	32	9	5	25	95	126	0	0	0	0	0	0	0	0	0	4	2
LK201	491	1043	1	3	0	1	2	3	2	0	0	0	0	0	0	0	0	0	0	0	1
LK201	491	1043	2	2	0	25	9	28	69	5	0	0	1	0	0	0	0	0	0	2	1
LK201	491	1043	3	4	0	9	7	40	80	0	0	0	0	0	0	0	0	0	0	2	5
LK201	491	1043	4	69	0	101	8	52	0	19	0	0	0	0	0	0	0	0	1	5	2
LK201	491	1043	5	4	0	75	1	12	0	13	0	0	0	0	0	0	0	0	0	5	2
LK201	491	1043	6	223	0	8	2	28	0	6	0	0	0	0	0	0	0	0	1	0	1
LK201	491	1043	7	156	0	24	3	16	21	2	0	0	0	0	0	0	0	0	1	1	1
LK201	491	1043	8	1	0	1	3	14	30	33	0	0	0	0	0	0	0	0	0	1	1
LK201	491	1043	9	8	0	3	2	5	21	9	0	0	0	0	0	0	0	0	1	0	3
LK201	491	1043	10	5	0	6	2	4	8	1	0	0	0	0	0	0	0	0	1	3	9
LK201	491	1043	11	30	0	88	2	15	15	4	0	0	2	0	0	0	0	0	2	15	39
LK201	491	1043	12	396	0	287	25	61	8	4	0	0	0	0	0	0	0	0	3	14	19
LK201	491	1043	13	18	0	2	0	4	5	1	0	0	0	0	0	0	0	0	0	1	1
LK201	491	1043	14	0	0	117	1	3	12	17	0	0	0	0	0	0	0	0	0	1	1
LK201	491	1043	15	114	1	36	2	14	9	67	0	0	0	0	0	0	0	2	0	1	1
LK201	491	1043	16	30	0	66	0	1	12	20	0	0	0	0	0	0	0	0	0	1	0
LK201	491	1043	17	774	71	537	12	88	1	6	0	0	1	0	0	0	0	0	0	1	1
LK201	491	1043	18	900	0	69	0	1	3	0	0	0	0	0	0	0	0	1	0	1	0
LK201	491	1043	19	1	0	20	3	17	13	0	0	0	0	0	0	0	0	0	0	1	3
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LK201	491	1044	11	192	21	23	1	4	8	5	0	0	1	0	0	0	0	0	0	4	3
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LK201	497	996	13	454	232	294	4	12	30	1	0	0	0	0	0	0	0	0	0	2	3
LK201	497	996	14	229	124	366	5	6	35	0	0	0	0	0	0	0	0	0	0	2	7
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LK201	497	996	17	533	33	56	4	2	92	0	0	0	0	0	0	0	0	0	0	0	0
LK201	497	996	18	224	57	16	0	1	143	0	0	0	0	0	1	0	0	0	0	1	0
LK201	497	997	1	0	0	41	0	3	3	0	0	0	0	0	0	0	0	0	0	0	1
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LK201	497	997	3	5	2	183	14	70	242	47	0	1	1	0	0	0	0	0	1	0	25
LK201	497	997	4	4	0	34	11	68	97	3	0	2	1	0	0	0	0	0	1	2	53
LK201	497	997	5	5	54	62	14	76	50	1	0	0	0	0	0	0	0	0	0	1	22
LK201	497	997	6	4	0	13	1	26	31	0	0	0	0	0	0	0	0	0	0	2	6
LK201	497	997	7	6	0	173	5	26	4	0	0	0	0	0	0	0	0	0	0	4	2
																				0	1

Part I: Phase II Excavations (continued)

SITE	NORTH	EAST	LEV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
LK201	497	997	8	1	0	210	2	7	1	0	0	0	0	0	0	0	0	0	0	0	2
LK201	497	997	10	181	10	32	26	44	23	9	0	0	1	0	0	0	0	0	1	5	7
LK201	497	997	11	200	4	5	24	29	12	1	0	0	0	0	0	0	0	1	0	7	9
LK201	497	997	12	19	0	3	7	10	5	0	0	0	0	0	0	0	0	0	0	0	1
LK201	497	997	13	279	27	154	6	22	36	1	0	0	1	0	0	2	0	1	1	6	6
LK201	497	997	14	900	248	157	10	23	41	1	0	0	0	0	0	0	0	1	1	7	12
LK201	497	997	15	367	0	844	7	16	40	1	0	0	0	0	0	0	0	0	0	2	2
LK201	497	997	16	230	0	49	1	4	34	1	0	0	0	0	0	0	0	0	0	1	0
LK201	497	997	17	503	0	19	0	1	90	0	0	0	0	0	0	0	0	0	0	0	2
LK201	497	997	18	702	136	152	2	2	420	0	0	0	1	0	0	0	0	0	0	0	0
LK201	497	998	1	0	0	5	0	2	3	0	0	0	0	0	0	0	0	0	0	0	1
LK201	497	998	2	0	0	43	1	7	19	3	0	0	0	0	0	1	0	0	1	5	21
LK201	497	998	3	17	0	238	13	42	109	45	0	0	0	0	1	1	0	0	1	20	0
LK201	497	998	4	25	0	33	14	62	131	13	0	0	0	0	0	0	0	1	1	5	17
LK201	497	998	5	2	0	3	12	86	55	10	0	0	0	0	0	0	0	0	1	1	4
LK201	497	998	6	8	0	33	16	142	267	0	0	0	0	1	0	0	0	0	0	4	4
LK201	497	998	7	11	0	2	4	20	27	1	0	0	0	0	0	0	0	1	0	2	1
LK201	497	998	8	3	0	14	5	12	5	0	0	0	0	0	0	0	0	0	0	1	0
LK201	497	998	9	238	0	11	9	17	15	1	0	0	0	0	0	0	0	0	0	4	2
LK201	497	998	10	531	0	26	52	170	132	2	0	0	0	0	0	0	0	2	0	9	15
LK201	497	998	11	320	64	14	35	85	48	1	0	0	0	0	0	0	0	0	0	2	3
LK201	497	998	12	14	0	1	5	14	16	1	0	0	0	0	0	0	0	0	0	0	1
LK201	497	998	13	95	2	24	4	11	36	12	0	0	0	0	0	0	0	0	1	4	2
LK201	497	998	14	798	154	78	3	6	39	2	0	0	0	0	0	0	0	0	0	4	9
LK201	497	998	15	833	154	424	9	33	33	1	0	0	0	0	0	0	0	0	0	3	1
LK201	497	998	16	128	154	55	0	1	29	0	0	0	0	0	0	0	0	0	0	1	1
LK201	497	998	17	128	0	0	2	9	63	0	0	0	0	0	0	0	0	0	0	1	1
LK201	497	998	18	682	452	375	1	1	312	0	0	0	1	0	0	0	0	0	1	0	5
LK201	498	996	1	1	0	1	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0
LK201	498	996	2	0	16	110	17	106	55	7	0	0	0	2	0	0	0	1	0	9	22
LK201	498	996	3	2	1	133	19	109	396	12	0	0	0	4	0	0	0	2	1	18	28
LK201	498	996	4	0	21	21	25	67	75	1	0	0	0	0	0	0	0	0	0	4	10
LK201	498	996	6	56	0	78	2	24	17	0	0	0	0	0	0	0	0	0	0	1	0
LK201	498	996	7	0	102	5	5	45	6	1	0	0	0	0	0	0	0	0	0	3	1
LK201	498	996	10	259	0	1	4	15	16	0	0	0	0	0	0	0	0	0	0	3	0
LK201	498	996	11	7	14	27	10	29	6	3	0	0	0	0	0	0	0	0	0	1	7
LK201	498	996	12	145	8	38	0	1	19	0	0	0	0	0	0	0	0	0	0	2	1
LK201	498	996	13	434	89	300	12	20	80	0	0	0	0	0	0	0	0	0	1	10	14
LK201	498	996	14	399	165	240	10	18	24	1	0	0	0	0	0	2	0	4	1	21	12
LK201	498	996	15	214	0	239	0	3	18	0	0	0	0	0	0	0	0	0	0	0	1
LK201	498	996	16	483	0	33	0	1	44	1	0	0	0	0	0	0	0	0	0	0	1
LK201	498	996	17	460	0	49	0	1	98	0	0	0	0	0	0	0	0	0	0	0	1
LK201	498	996	18	445	119	153	0	3	177	1	0	0	1	0	0	0	0	0	0	3	20
LK201	498	997	1	11	0	81	0	2	5	0	0	0	0	0	0	0	0	0	0	2	1
LK201	498	997	2	2	0	11	6	15	45	96	0	0	0	0	0	0	0	0	1	7	13
LK201	498	997	3	95	0	338	34	329	1333	51	0	0	0	7	0	0	0	0	2	34	64
LK201	498	997	4	7	169	47	19	125	194	8	0	0	0	2	0	0	0	0	0	23	31
LK201	498	997	5	0	17	66	9	62	44	0	0	0	0	0	0	0	0	0	0	2	1
LK201	498	997	6	31	0	3	8	47	15	0	0	0	0	0	0	0	0	0	0	0	0
LK201	498	997	7	142	0	131	5	39	0	0	0	0	0	0	0	0	0	0	0	1	0
LK201	498	997	10	20	14	3	9	22	13	0	0	0	0	0	0	1	0	1	0	3	0
LK201	498	997	11	677	96	7	164	278	39	2	0	0	0	0	0	1	0	1	0	1	5
LK201	498	997	12	51	0	3	1	2	0	0	0	0	0	0	0	0	0	0	0	3	1
LK201	498	997	13	186	168	105	3	4	44	0	0	0	1	0	0	0	0	0	0	0	0
LK201	498	997	14	418	197	188	9	20	0	2	0	0	0	0	0	0	0	0	1	12	3
LK201	498	997	15	708	17	45	3	25	59	2	0	0	0	0	0	0	0	1	1	2	0
LK201	498	997	16	140	11	73	2	4	42	1	0	0	0	0	0	0	0	0	0	1	1
LK201	498	997	17	335	25	191	0	4	142	1	0	0	0	0	0	0	0	0	0	2	1
LK201	498	997	18	529	98	194	2	5	272	3	0	0	0	0	0	0	0	1	0	2	0
LK201	498	998	1	0	0	13	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5
LK201	498	998	2	0	0	87	3	32	70	64	0	0	0	1	0	0	0	0	0	5	11
LK201	498	998	3	0	0	140	21	168	429	118	2	0	0	2	0	0	0	0	0	27	48
LK201	498	998	4	32	0	136	17	83	134	5	0	0	0	0	0	0	0	0	0	10	34
LK201	498	998	5	42	10	89	12	85	67	1	0	0	0	0	0	0	0	0	0	1	2
LK201	498	998	6	104	0	9	6	40	37	0	0	0	0	0	0	0	0	0	0	4	1
LK201	498	998	7	212	21	1	6	30	3	0	0	0	0	0	0	0	0	0	0	1	3
LK201	498	998	8	102	12	2	10	63	4	0	0	0	0	0	0	0	0	0	1	1	2
LK201	498	998	9	217	0	11	8	9	20	3	0	0	0	0	0	0	0	0	0	0	1
LK201	498	998	10	306	15	62	52	127	65	2	0	0	0	0	0	0	0	1	0	5	2
LK201	498	998	11	16	29	36	66	96	24	1	0	0	0	0	0	0	0	0	0	0	0
LK201	498	998	12	100	0	10	2	3	7	0	0	0	0	0	0	0	0	0	0	1	0
LK201	498	998	13	193	16	34	4	7	62	1	0	0	0	1	0	0	0	0	0	4	0
LK201	498	998	14	612	222	167	13	18	62	1	0	0	0	0	0	0	0	0	0	3	5
LK201	498	998	15	597	19	117	7	17	29	1	0	0	0	0	0	0	0	0	1	13	11
LK201	498	998	16	155	3	22	1	7	33	1	0	0	0	0	0	0	0	0	0	2	4
LK201	498	998	17	314	77	139	3	17	93	1	0	0	0	0	0	0	0	0	0	0	3

Part I: Phase II Excavations (continued)

SITE	NORTH	EAST	LEV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
LK201	498	998	18	665	311	69	0	1	125	1	0	0	0	0	0	0	0	0	0	3	2
LK201	499	996	2	30	0	153	12	102	51	2	0	0	1	0	0	0	0	0	1	7	4
LK201	499	996	3	4	5	151	17	183	263	24	0	0	3	0	1	0	0	0	1	21	17
LK201	499	996	4	84	0	18	35	188	109	3	0	0	0	0	0	0	0	0	0	4	6
LK201	499	996	5	191	0	74	40	205	146	1	0	0	1	0	0	0	0	0	2	4	9
LK201	499	996	6	30	41	3002	1	10	9	1	0	0	0	0	0	0	0	0	0	0	2
LK201	499	996	7	98	0	74	11	71	13	1	0	0	0	0	0	0	0	0	0	0	0
LK201	499	996	10	26	51	1	9	10	15	1	0	0	0	0	0	0	0	0	0	2	0
LK201	499	996	11	301	9	12	64	79	24	3	0	0	0	0	0	0	0	0	1	2	1
LK201	499	996	12	130	3	20	1	4	14	0	0	0	0	0	0	0	0	0	0	1	0
LK201	499	996	13	162	68	176	9	11	112	1	0	0	0	0	0	0	0	0	0	2	1
LK201	499	996	14	42	53	192	4	13	46	1	0	0	0	0	0	0	0	0	0	1	1
LK201	499	996	15	768	13	583	2	14	35	3	0	0	0	0	0	0	0	0	0	1	1
LK201	499	996	16	858	9	73	5	4	31	2	0	0	0	0	1	0	0	0	0	2	0
LK201	499	996	17	302	8	2	2	6	134	2	0	0	0	0	0	0	0	0	0	1	0
LK201	499	996	18	444	99	257	2	5	87	1	0	0	0	0	0	0	0	0	0	1	0
LK201	499	997	1	0	1	0	2	5	1	0	0	0	0	0	0	0	0	0	0	2	0
LK201	499	997	2	0	0	7	10	38	69	5	0	0	3	0	0	0	0	0	0	9	1
LK201	499	997	3	36	15	47	17	154	1342	77	2	0	10	0	1	0	0	0	1	36	9
LK201	499	997	4	3	0	178	30	242	206	15	0	0	4	0	0	0	0	0	0	6	3
LK201	499	997	5	639	0	118	8	68	48	1	0	0	0	0	2	0	0	0	0	3	1
LK201	499	997	6	76	0	0	11	51	9	0	0	0	0	0	0	0	0	0	0	1	0
LK201	499	997	7	25	23	10	4	13	1	0	0	0	0	0	0	0	0	0	0	1	0
LK201	499	997	10	423	34	1	36	72	7	0	0	0	1	0	0	0	0	0	0	1	0
LK201	499	997	11	371	0	6	103	184	18	2	0	0	0	0	0	1	0	0	0	3	1
LK201	499	997	12	33	0	1	1	3	3	0	0	0	0	0	0	0	0	0	0	3	1
LK201	499	997	13	117	0	45	6	13	30	1	0	0	0	0	0	0	0	0	0	2	1
LK201	499	997	14	223	94	276	5	14	32	1	0	0	0	0	0	0	0	0	0	2	0
LK201	499	997	15	892	9	516	7	28	19	1	0	0	0	0	2	0	0	0	0	1	0
LK201	499	997	16	504	2	124	2	7	40	1	0	0	0	0	0	0	0	0	0	0	0
LK201	499	997	17	240	0	2	2	10	150	0	0	0	0	0	0	0	0	0	0	0	1
LK201	499	997	18	553	27	108	0	2	133	0	0	0	1	0	0	0	0	0	0	1	0
LK201	499	998	1	0	0	1	0	2	1	3	0	0	0	0	0	0	0	0	0	3	0
LK201	499	998	2	0	0	52	7	23	12	2	0	0	1	0	0	0	0	0	0	3	0
LK201	499	998	3	44	0	66	17	187	1112	61	0	1	4	0	0	0	0	0	0	9	5
LK201	499	998	4	334	14	215	31	178	178	22	0	0	0	0	0	0	0	0	0	5	2
LK201	499	998	5	99	0	96	25	184	49	0	0	0	0	0	0	0	0	0	0	0	4
LK201	499	998	6	16	0	1	10	102	28	0	0	0	0	0	0	0	0	0	0	1	1
LK201	499	998	7	82	92	45	6	18	5	0	0	0	0	0	0	0	0	0	0	1	1
LK201	499	998	8	42	25	26	4	32	6	1	0	0	0	0	0	0	0	0	0	0	0
LK201	499	998	9	29	0	0	3	22	5	1	0	0	0	0	0	0	0	0	0	1	0
LK201	499	998	10	133	0	0	5	16	6	3	0	0	0	0	0	0	0	0	0	1	0
LK201	499	998	11	381	0	0	61	96	20	1	0	0	0	0	0	0	0	0	0	1	0
LK201	499	998	12	19	0	1	3	4	16	0	0	0	1	0	0	0	0	0	0	1	0
LK201	499	998	13	71	0	8	2	12	19	2	0	0	0	0	0	0	0	0	0	4	0
LK201	499	998	14	243	0	64	0	0	22	8	1	0	0	0	0	0	0	0	0	5	2
LK201	499	998	15	404	0	76	6	20	17	1	0	0	0	0	0	0	0	1	0	2	2
LK201	499	998	16	492	0	93	0	1	18	1	0	0	0	0	0	0	0	0	0	2	0
LK201	499	998	17	316	0	10	2	12	143	0	0	0	0	0	0	0	0	0	0	0	0
LK201	499	998	18	653	200	283	5	23	156	0	0	0	0	0	0	0	0	0	0	0	0
LK201	500	996	1	0	0	2	0	1	1	0	0	0	0	0	0	1	0	0	0	0	2
LK201	500	996	2	14	100	32	1	29	10	2	0	0	0	0	0	0	0	0	0	0	0
LK201	500	996	3	0	0	245	6	69	85	7	0	0	1	0	0	0	0	0	1	3	1
LK201	500	996	4	84	5	126	25	133	41	0	1	0	0	0	0	0	0	0	0	3	4
LK201	500	996	5	145	4	286	13	73	38	1	0	0	0	0	0	2	0	0	0	2	5
LK201	500	996	6	15	1	42	7	22	14	0	0	0	0	0	0	0	0	0	0	1	0
LK201	500	996	10	0	0	6	10	19	8	0	1	0	0	0	0	0	0	0	0	0	0
LK201	500	996	11	74	76	2	41	90	25	1	0	0	2	0	0	0	0	0	0	16	39
LK201	500	996	12	97	49	8	1	3	9	0	0	0	0	0	0	0	0	0	0	2	0
LK201	500	996	13	111	16	109	12	14	30	1	0	0	0	0	0	0	0	1	0	16	8
LK201	500	996	14	52	3	14	3	5	43	0	0	0	0	0	0	0	0	0	0	4	2
LK201	500	996	15	695	0	322	4	12	17	0	1	0	0	0	2	0	0	0	0	2	5
LK201	500	996	16	1297	0	1	0	2	157	1	0	0	0	0	0	0	0	0	1	3	5
LK201	500	996	17	1271	0	1	0	2	157	1	0	0	0	0	0	0	0	0	1	3	5
LK201	500	996	18	768	39	62	0	1	90	0	1	0	0	0	0	0	0	0	0	1	2
LK201	500	996	19	47	0	6	1	1	41	0	0	0	0	0	1	0	0	0	1	0	5
LK201	500	996	20	3	0	6	0	1	17	0	0	0	0	0	0	0	0	0	0	0	1
LK201	500	996	21	4	15	4	0	1	13	0	0	0	0	0	0	0	0	0	1	0	7
LK201	500	996	22	13	0	33	0	1	8	0	0	0	0	0	0	0	0	0	0	0	1
LK201	500	996	23	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
LK201	500	996	24	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1
LK201	500	996	25	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
LK201	500	997	1	13	3	1	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0
LK201	500	997	2	31	0	15	2	23	5	0	0	0	0	0	0	0	0	0	0	5	0
LK201	500	997	3	32	0	73	9	97	112	4	1	0	0	0	2	0	0	0	0	5	9
LK201	500	997	4	214	0	182	36	175	138	1	0	0	0	0	0	0	0	0	1	7	11

Part I: Phase II Excavation (continued)

SITE	NORTH	EAST	LEV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
LK201	500	997	5	174	318	6	18	121	41	1	0	0	0	0	0	1	0	0	1	3	5
LK201	500	997	6	6	0	1	9	26	22	1	0	0	0	0	0	0	0	0	0	4	1
LK201	500	997	10	26	0	0	12	20	9	0	0	0	0	0	0	0	0	0	0	3	4
LK201	500	997	11	86	0	0	85	112	16	0	0	0	0	0	0	0	0	0	0	3	6
LK201	500	997	12	118	0	24	1	1	41	0	0	0	0	0	0	0	0	0	1	0	6
LK201	500	997	13	167	0	40	11	13	14	1	0	0	0	0	0	0	0	2	1	17	6
LK201	500	997	14	33	0	0	1	4	16	1	0	0	0	0	0	0	0	0	0	3	5
LK201	500	997	15	416	0	99	2	4	37	0	0	0	0	0	0	0	0	0	1	3	5
LK201	500	997	16	1093	330	373	4	15	61	7	0	0	0	0	0	0	0	1	0	0	4
LK201	500	997	17	454	29	62	1	2	144	1	0	0	0	0	0	0	0	0	0	1	9
LK201	500	997	18	685	89	37	1	1	112	1	0	0	0	0	0	0	0	0	0	2	1
LK201	500	997	19	131	0	57	0	0	37	0	0	0	1	0	0	0	0	0	0	4	27
LK201	500	997	20	8	0	1	0	0	25	0	0	0	0	0	0	0	0	0	0	1	3
LK201	500	997	21	8	0	2	0	0	35	0	0	0	0	0	0	0	0	0	0	1	0
LK201	500	997	22	1	0	1	0	0	8	0	0	0	0	0	0	0	0	0	0	0	1
LK201	500	997	23	1	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0
LK201	500	997	24	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
LK201	500	997	25	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
LK201	500	998	3	17	31	378	23	134	1003	51	0	2	13	0	1	0	0	1	7	169	957
LK201	500	998	4	105	0	119	23	141	302	8	0	0	2	0	0	0	0	0	0	37	587
LK201	500	998	5	48	0	104	16	137	97	2	0	1	0	0	0	0	0	1	1	0	11
LK201	500	998	6	14	89	12	16	90	88	1	0	0	1	0	0	0	0	1	0	1	5
LK201	500	998	7	17	8	3	5	24	46	2	0	0	0	0	0	0	0	1	2	2	6
LK201	500	998	8	21	20	20	3	17	16	1	0	0	0	0	0	0	0	0	2	3	11
LK201	500	998	9	4	0	15	4	36	13	1	0	0	0	0	0	0	0	0	1	1	3
LK201	500	998	10	153	0	3	5	6	17	1	0	0	0	0	0	0	0	0	1	2	4
LK201	500	998	11	231	0	1	14	15	32	1	0	0	0	0	0	0	0	0	0	1	5
LK201	500	998	12	34	0	1	2	12	55	1	0	0	0	0	0	0	0	0	0	2	9
LK201	500	998	13	93	97	32	37	53	109	7	0	0	1	0	0	0	0	0	1	9	32
LK201	500	998	14	165	17	3	5	17	46	1	0	0	0	0	0	0	0	0	0	4	17
LK201	500	998	15	200	14	23	10	24	118	1	0	0	0	0	0	0	0	0	0	1	2
LK201	500	998	16	1037	0	150	1	12	289	11	0	0	0	0	0	0	0	0	0	0	5
LK201	500	998	17	306	21	24	2	2	258	0	0	0	0	0	0	0	0	0	0	2	4
LK201	500	998	18	125	42	0	1	19	231	1	0	0	0	0	0	0	0	1	0	1	4
LK201	500	998	19	81	0	0	0	1	94	1	0	0	0	0	0	0	0	0	0	6	8
LK201	500	998	20	11	0	1	0	1	71	1	0	0	0	0	0	0	0	0	0	2	7
LK201	500	998	21	1	0	86	0	0	36	0	0	0	0	0	0	0	0	0	1	3	4
LK201	500	998	22	4	2	2	1	1	18	0	0	0	0	0	0	0	0	0	0	1	0
LK201	500	998	23	1	0	0	0	1	5	1	0	0	0	0	0	0	0	0	0	0	1
LK201	500	998	24	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	2
LK201	500	998	25	1	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0
LK201	510	1020	1	0	2	1	1	1	6	1	0	0	0	0	0	0	0	0	0	0	1
LK201	510	1020	2	2	0	1	2	1	9	4	0	0	1	0	0	0	0	0	0	1	3
LK201	510	1020	3	2	0	23	6	12	39	0	0	2	1	0	0	0	0	0	0	9	14
LK201	510	1020	4	14	2	17	10	39	17	5	0	0	0	0	0	0	0	0	0	3	17
LK201	510	1020	5	0	0	11	20	77	17	18	0	1	0	2	0	1	0	0	0	7	4
LK201	510	1020	6	4	1	32	21	59	23	9	0	0	0	0	0	0	0	0	0	3	12
LK201	510	1020	7	0	182	33	13	52	19	0	0	0	0	0	0	0	0	0	1	1	4
LK201	510	1020	8	2	86	20	18	90	12	2	0	0	0	0	0	0	0	0	0	2	17
LK201	510	1021	1	0	0	1	0	1	10	1	0	0	0	0	0	0	0	0	0	0	1
LK201	510	1021	2	1	0	0	0	1	1	19	0	1	1	0	0	0	0	0	0	0	0
LK201	510	1021	3	2	0	16	6	47	11	96	0	0	0	0	2	0	0	0	0	1	8
LK201	510	1021	5	2	0	69	23	129	26	1	0	0	0	0	0	0	0	0	0	5	3
LK201	510	1021	6	4	0	7	10	48	12	0	0	0	0	0	0	0	0	0	0	2	4
LK201	510	1021	7	1	0	6	5	21	7	2	0	0	0	0	0	0	0	0	1	2	5
LK201	510	1021	8	105	63	24	22	108	12	1	0	0	0	0	0	0	0	0	1	6	6
LK201	510	1022	1	0	0	0	0	1	8	1	0	0	0	0	0	0	0	0	0	0	0

PART II: UTSA FIELD SCHOOL EXCAVATIONS

SITE	NORTH	EAST	LEV	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
LK201	490	1042	1	0	0	1	2	2	10	0	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1042	2	5	0	1	3	18	87	2	0	0	0	0	0	0	0	0	0	0	2
LK201	490	1042	3	0	0	3	3	21	78	2	0	1	0	0	0	0	0	0	0	2	3
LK201	490	1043	1	0	0	2	0	3	1	1	0	0	0	0	0	0	0	0	0	1	0
LK201	490	1043	2	18	0	1	2	17	34	1	0	0	0	0	0	0	0	0	0	1	2
LK201	490	1043	3	17	1	23	8	43	285	4	0	0	0	0	0	0	0	0	0	1	5
LK201	490	1043	4	33	83	74	9	76	0	7	0	0	0	0	0	0	0	1	0	5	1
LK201	490	1043	5	43	0	1	4	39	1	16	0	0	1	0	0	0	0	0	0	1	5
LK201	490	1043	6	14	0	39	5	41	0	4	0	0	0	0	0	0	0	0	0	1	2
LK201	490	1043	7	29	0	1	4	39	0	1	0	0	0	0	0	0	0	0	0	1	2
LK201	490	1043	8	0	0	2	2	9	0	6	0	0	0	0	0	0	0	0	0	1	1
LK201	490	1043	9	27	0	4	4	30	13	2	0	0	0	0	0	0	0	1	0	1	2
LK201	490	1043	10	12	0	17	2	9	15	4	0	0	2	0	0	0	0	1	0	2	1
LK201	490	1043	11	0	0	12	29	151	18	17	0	0	0	0	0	0	0	2	0	10	5
LK201	490	1043	12	379	0	108	17	58	29	35	0	0	0	0	0	0	0	2	0	15	0
LK201	490	1043	13	64	0	46	6	7	20	12	0	0	0	0	0	0	0	0	0	3	4
LK201	490	1043	14	45	0	5	0	5	10	2	0	0	0	0	0	0	0	0	0	2	4
LK201	490	1043	15	161	0	109	3	6	29	3	0	0	0	0	0	0	0	0	0	1	1
LK201	490	1043	16	25	58	72	4	32	8	3	0	0	0	0	0	0	0	0	0	0	2
LK201	490	1043	17	31	20	110	1	13	2	3	0	0	0	0	0	0	0	0	0	0	1
LK201	490	1043	18	491	18	55	3	9	8	5	0	0	0	0	0	0	0	0	0	0	1
LK201	490	1043	19	292	4	1	2	11	25	4	1	0	0	0	0	0	0	0	0	0	1
LK201	490	1044	1	0	0	0	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	2	1	0	1	0	2	35	1	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	3	4	8	63	4	15	88	1	0	0	0	0	0	0	0	0	0	0	3
LK201	490	1044	4	3	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	3
LK201	490	1044	5	2	0	1	7	51	0	1	0	0	0	0	0	0	0	1	0	0	0
LK201	490	1044	6	0	0	53	2	17	0	10	0	0	0	0	0	0	0	0	0	1	0
LK201	490	1044	7	7	0	27	2	2	0	10	0	0	0	0	0	0	0	0	0	0	2
LK201	490	1044	8	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0	1	4
LK201	490	1044	9	2	0	1	0	3	9	1	0	0	0	0	0	0	0	0	0	1	4
LK201	490	1044	10	14	0	14	4	24	6	2	0	0	1	0	0	0	0	1	0	8	0
LK201	490	1044	11	3	1	1	6	62	15	1	0	0	0	0	0	0	0	1	0	2	0
LK201	490	1044	12	59	0	2	4	18	134	1	0	0	1	0	0	0	0	0	0	4	0
LK201	490	1044	13	2	0	17	4	9	11	0	0	0	0	0	0	0	0	1	0	0	0
LK201	490	1044	14	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	15	111	0	1	0	1	14	1	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	16	0	40	8	3	28	1	1	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	17	0	1	39	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0
LK201	490	1044	18	445	19	93	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0