BACKGROUND TO THE ARCHAEOLOGY OF CHAPARROSA RANCH, SOUTHERN TEXAS

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Volume 1. Studies in the Archaeology of Chaparrosa Ranch
Thomas R. Hester, Series Editor

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PREFACE

The Chaparrosa Ranch, located in Zavala County, southern Texas, constitutes an ideal area for long-range archaeological research. Flowing through the ranch are Chaparrosa and Turkey Creeks, two major tributaries in the Nueces River system. These creeks and subsidiary drainages have cut pronounced valleys and terrace systems. As of this writing, nearly 200 prehistoric and historic archaeological sites have been documented in these valleys and in the adjacent uplands.

Late in the summer of 1969, Mr. Wayne Hamilton (former business manager for the ranch) showed me several of the known sites at Chaparrosa Ranch. I was impressed by the potential for long-term studies which would hopefully contribute to a better understanding of southern Texas prehistory. In early 1970, I prepared a research plan, which was submitted to the ranch owner, Mr. Belton K. Johnson, and to the Texas State Historical Committee (now the Texas Historical Commission). Mr. Johnson approved of the planned research and the Texas State Historical Committee, through Mr. Curtis Tunnell (state archaeologist), provided funding for the first season's work. Additional funding came from the Graduate Division of the University of California, Berkeley, and from the American Philosophical Society (Grant No. 6313, Penrose Fund). Logistical support was made available by the Texas Archeological Research Laboratory, the Texas Archeological Salvage Project and the Texas Memorial Museum. Fieldwork was conducted in August and September 1970, and the results are found in the first paper in this volume.

Since that initial season in 1970, two other major field sessions, and several brief investigations, have been conducted at the ranch. The 1974 and the 1975 sessions of the graduate Field Course in Archaeology of The University of Texas at San Antonio were held there. During the six-week session in summer 1974, there were extensive excavations at 41 ZV 83 (Mariposa Site), and the results of this work have been compiled by John Montgomery in his Master's Thesis at Texas Tech University. His monograph appears as Volume 2 in the Center's Chaparrosa Ranch series. A preliminary statement on the 1974 fieldwork is reprinted in the present volume. An initial account of the six weeks of research carried out in 1975 is also presented here. This program of investigations has included site survey, controlled surface collecting, testing, excavation and a series of other research endeavors.

The studies have resulted in a mass of data, in terms of artifacts, notes and the results of special analyses. With this volume, in which a variety of background information is provided, we are initiating the final publication of the materials from Chaparrosa Ranch. It will take several volumes for the publication program to be completed. Some artifacts still await analysis, and there are data yet to be interpreted, but much has already been accomplished and drafts of a number of reports have been prepared. These await editing and revision before they can be published. Vegetational studies, radiocarbon results, faunal analyses and related research data must also be collated and integrated into forthcoming publications.

I am grateful to many people for assistance during the project, and I trust that all have been acknowledged in the various papers reprinted here. I want to

again extend my appreciation to Mr. Belton K. Johnson, owner of the Chaparrosa Ranch, for his cooperation and support, and to Mr. Wayne Hamilton for his sustained interest in, and encouragement of, our research.

Thomas R. Hester
November 1978

AN INTERIM STATEMENT ON ARCHAEOLOGICAL RESEARCH AT CHAPARROSA RANCH, TEXAS[1]

Thomas R. Hester

INTRODUCTION

In late August and early September 1970, I carried out archaeological investigations at the 60,000 acre Chaparrosa Ranch in southern Texas (Fig. 1). The work was made possible by the cooperation of the ranch owner, B. K. Johnson, and ranch personnel; by grants from the Graduate Division, The University of California at Berkeley; and by the Texas State Historical Survey Committee (Truett Latimer, Director; Curtis D. Tunnell, State Archaeologist). Equipment and vehicle needs were met by the Texas Archeological Research Laboratory, the Texas Archeological Salvage Project and the Texas Memorial Museum.

This brief report is presented in partial fulfillment of a contract signed with the Texas State Historical Survey Committee. A final report is forthcoming, but must await analysis of the large body of artifactual and documentary data collected during the research. A number of special studies are planned, and in some cases, already in progress. These include: (1) analysis of flake debris from a number of recorded sites; (2) studies of faunal remains; (3) studies of soil samples, including pollen analysis; and (4) radiocarbon dating of charcoal samples.

ENVIRONMENTAL PERSPECTIVE

The Chaparrosa Ranch is located in northwestern Zavala County, on the Rio Grande Plain of southern Texas. The present-day climate is semi-arid, with current annual rainfall of 21.87 inches (*Texas Almanac* 1970:352). Temperatures in winter are usually mild though lows in the 20-30°F range can occur, especially after the passage of cold fronts. Summers are hot and humid with temperatures often climbing near or above 100°F. The ranch area is one of low topographic relief, cut by the stream valleys of Turkey, Chaparrosa and Palo Blanco Creeks. These major creeks are fed by numerous minor tributaries. The larger creeks were perennial up until the early part of this century when the water table was lowered by several factors, including denudation of the watershed caused by overgrazing (Wayne Hamilton, personal communication).

The vegetation and fauna are typical of the Tamaulipan Biotic Province (Dice 1943; Blair 1950). On the ranch, thorny brush such as mesquite, black brush, retama, guayacan and huisache dominate the vegetation; portions of the ranch have been cleared of these brushy species and grasslands have been restored. Kroeber (1939:Map 4) characterizes the region as a mesquite and desert grass.

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[1]This research was conducted in summer 1970, while the author was a student at the University of California at Berkeley. Funding was provided by the University and by the Texas State Historical Committee. This report was submitted in 1970 to the Office of the State Archeologist, Austin.

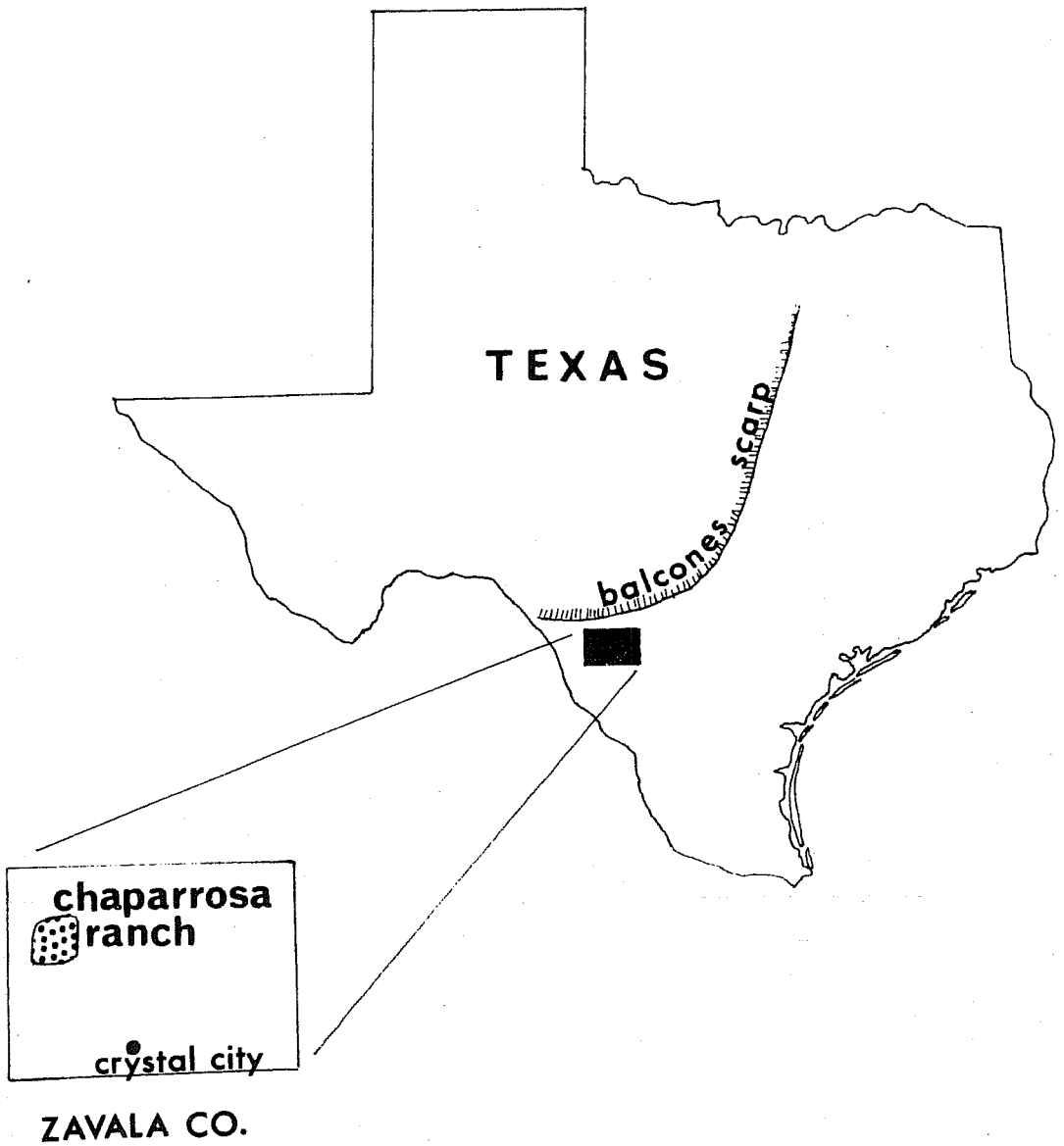


Figure 1. *Location of Chaparrosa Ranch, Zavala County, Texas.*

savanna. There are large hardwoods and other trees concentrated in riparian zones of the major stream courses (cf. Havard 1885). These include oak, elm, ash, hackberry, pecan and persimmon. There are additional localized vegetational patterns which reflect ecological and topographical conditions (Soil Conservation Service 1966) and these will be treated in detail in the final report.

The native fauna include whitetail deer, javelina (or peccary), coyote, jackrabbit, cottontail rabbit, turkey, quail, hawks and a variety of other avifauna, snakes, lizards and tortoises. For detailed data on the faunal inventory of the Tamaulipan Biotic Province, see Blair (1950; 1952).

There has been a dramatic shift in vegetational patterns on the Rio Grande Plain since the beginning of the historic period. A number of Spanish expeditions crossed Zavala County (Inglis 1964; parties led by del Bosque in 1675 and Teran in 1691 appear to have been the earliest). In general, these groups recorded open, level prairies with occasional groves and thickets of large trees and mesquites. Dense forests were noted in the riparian environments of the Nueces River stream bed, while in other years, visitors observed a deep, flowing stream. The prairie conditions (grassland climax) continued well into the first half of the 19th century. Beginning around 1850, travelers record an apparent increase in the occurrence of mesquite and associated thorny species on the grasslands (Inglis 1964:83-84). These thorny invaders came to dominate the vegetation in the latter part of the 19th century. Bogusch (1952) feels that this rapid invasion of thorn brush was brought about by several conditions, especially the restriction of cattle range through fencing and the cessation of the aboriginal practice of periodically firing the prairie (cf. Covey 1961; Jelinek 1967).

Most of the fauna in the region in early historic times remain today, though their numbers and distribution have been somewhat altered by civilization. There are certain exceptions. For example, Manzanet (quoted in Inglis 1964:81) reported seeing "great quantities of buffaloes" in northern Zavala County in 1691. Some years earlier, the Bosque-Larios expedition made a stop somewhere along Chaparrosa Creek and recorded "many buffalo" (Bolton 1916:299; Brewster 1947:8). Bollaert (1956) noted antelope in northeastern Zavala County in the 1840s. Bear were also present (Espinosa, in Weddle 1968:60). The extent of the bison, antelope and bear populations remains unclear.

It is obvious that we can utilize the Spanish and early Anglo sources to obtain a moderately complete view of the fauna and flora of the Rio Grande Plain (and in particular, the Zavala County area) at the beginning of the historic era. We can also trace various environmental changes from that time to the present. However, we are hard pressed to deal with prehistoric environments of the region, though we can assume that the conditions present at historic contact had existed for some time.

Pollen studies in the Trans-Pecos (Bryant and Larson 1968) and in central Texas (Bryant, in Valastro and Davis 1970) have supplied us with the following general scheme of prehistoric climatic progression: (1) between 14,000 and 7000 B.P. (B.P.=before present, as calculated from a base date of A.D. 1950), both areas

were dominated by parkland vegetation with pinyon in the Trans-Pecos and deciduous woodlands/oak savannas in central Texas; (2) between 7000 and 4500 B.P., conditions were hot and dry (the Altithermal of Antevs 1948); (3) from 4500 years ago to the present, the climate has been one of increasing aridity (interrupted by a brief mesic period in the Trans-Pecos about 2800 B.P.). A similar climatic progression may have been experienced in southern Texas, but we must await the results of paleoenvironmental research.

ETHNOGRAPHIC AND ARCHAEOLOGIC BACKGROUND

The Rio Grande Plain of southern Texas was inhabited at the time of European contact by more than 200 bands and small tribes of the Coahuiltecan linguistic stock (Swanton 1952). We assume that their ancestors inhabited the region for most, if not all, of the prehistoric period (cf. Suhm, Krieger and Jelks 1954: 138). The Coahuiltecan population of southern Texas and adjacent northeastern Mexico has been placed at 88,000 by Ruecking (1955). However, the Coahuiltec people were gone by 1800, destroyed by disease and acculturation (Troike 1962: 58).

Excellent ethnographic summaries of the Coahuiltecans have been published by Ruecking (1953, 1955) and Newcomb (1961). These peoples lived in small groups and practiced a semi-nomadic, hunting and food-collecting lifeway. The nature of the Coahuiltecan subsistence pattern necessitated the moving of camps every few days, after the resources of the surrounding countryside had been partially (but never fully) exploited. As Kelley (1952:139-144) has indicated, Coahuiltec groups living near the Nueces River and its major tributaries are known to have harvested pecan nuts in the late fall and early winter. In many areas of southern Texas, the ripened fruits (*tunas*) of prickly pear attracted Coahuiltec groups in late summer and early fall. The gathering of large numbers of peoples at the pecan and *tuna* harvests also provided a mechanism for cultural contact (Krieger 1956). Other seasonal wild foods could have included hackberry seeds (late September through early November), persimmon fruit (August and September) and in some areas, mesquite beans (Havard 1885; Kellet 1952). Various authors have concluded that life in the *monte* of southern Texas was one of a constant struggle for food (cf. Krieger 1956; Newcomb 1961). However, early Spanish accounts such as that of Espinosa in 1726 (see Weddle 1968:60) make it evident we should also take into account the probability that foodstuffs were processed and stored for later consumption; for example, Espinosa remarks (Weddle 1968:60) that " . . . the natives gathered enough wild nuts (pecans) to last them most of the year . . . storing them in holes in the ground."

Ethnohistorians have noted that the material culture of the Coahuiltecans was quite meager (Ruecking 1953, 1955; Beals 1932). They used weapons and tools of wood and stone, made clothing from skins and fibers, and built flimsy houses of grass and reeds. Only the objects of stone are preserved in the south Texas area.

We have few accounts of the native peoples in the immediate study area (Chaparrosa Ranch). The various Spanish expeditions which crossed Zavala County would at times record the presence of aboriginal groups, while at other times it would

be noted that the area was uninhabited or that abandoned campsites were observed. This may be due in part to the mobile subsistence activities of groups in the area. Campbell (ms) has recorded a number of Coahuiltec groups who lived in the general vicinity; these include: Quem, Pitalac, Pitahay, Patzau, Payuguan, Pampopa (recorded as living on the Nueces River in Uvalde, Zavala and Dimmit Counties in the 18th century), Pachal, Pacuachiam, Chaguane and Paac. It sould also be noted that Tonkawan groups were known to have ventured into the area from central Texas (Sjoberg 1953a). In the 1700s and later, both Lipan and Mescalero Apache groups were sometimes forced southward into the region by the encroachment of Comanches (Sjoberg 1953b; Weddle 1968; Newcomb 1969; Campbell ms).

The archaeology of southern Texas has been summarized by Suhm, Krieger and Jelks (1954), Hester, White and White (1969) and Hester (1976). Eroded, multi-component archaeological sites are common throughout the area, their locations reflecting attachment to water sources (cf. Taylor 1964; Hester 1970a) and the proximity of various resource areas (or "microenvironments"). Research at these sites has consisted largely of random surface collecting, from which several descriptive reports have resulted (Weir 1956; Sollberger 1951; Nunley and Hester 1966; Hester 1968a; Hester, White and White 1969; Hester 1972). Limited excavations were conducted in the Falcon Reservoir basin in the early 1950s (Cason 1952) and in the Rio Grande Valley (Newton 1968); in both instances, the results have yet to be fully published or interpreted. Small-scale attempts at controlled surface sampling have been carried out, but again, full interpretation is lacking (Shiner 1969).

Because of the lack of data from both excavations and controlled surface collections, the cultural sequence in southern Texas remains poorly known. There are scattered occurrences of *Folsom* and *Clovis* fluted points and an array of later lanceolate styles, all of which suggest the presence of Paleo-Indian groups (Weir 1956; Hester 1968a,b). However, no occupation sites are yet known for this early period. The majority of the archaeological remains from south Texas sites can be attributed to Archaic occupations (my concept of the Archaic approximates that of Willey and Phillips 1958:107, and Rolingson and Schwartz 1966:3). These materials include numerous unstemmed and stemmed dart points, thinned bifaces ("knives"), a variety of chopping and scraping tools, tools and ornaments of ground stone, and large amounts of debitage resulting from flint-knapping activities. There have been limited attempts to order these materials through correlation with cultural sequences established for northeastern Mexico, Trans-Pecos Texas and central Texas (Hester, White and White 1969; Hester 1976). The final prehistoric occupations in southern Texas (Neo-American or Late Prehistoric) are represented by the presence of arrow points of several types, a few changes in chipped stone tool forms, and in rare cases, the introduction of plain bone-tempered ceramics (Hester 1968c; Hester and Parker 1970; Hester and Hill 1971). Radiocarbon dates on similar late prehistoric manifestations from the southwestern edge of the Edwards Plateau suggest they began between A.D. 1000-1200 (Hester, in Valastro and Davis 1970; Hester 1971).

Ethnohistorical and archaeological data clearly indicate that a hunting and gathering lifeway persisted relatively unchanged in southern Texas from the earliest times into the historic era. The archaeological record, as we now interpret it, reveals little change in material culture through time, suggesting

that the native peoples had so adapted to their environment that only unusual events (such as the introduction of the bow and arrow, and ceramics, in the Late Prehistoric period) caused new traits to be acquired (cf. Coe and Flannery 1967:103).

RESEARCH PROBLEMS AND METHODOLOGY

The Chaparrosa Ranch was selected as a research area for a number of reasons. It covers a large geographic area, and access is easy to all parts. There has been relatively little disturbance of subsoil by land-clearing activities or erosion. Surface collecting of sites has been limited. There are a variety of topographical and ecological situations available for investigation. The presence of three major stream courses indicated that large numbers of sites could be anticipated.

The initial research at Chaparrosa Ranch in 1970 was oriented toward two major goals: (1) the recording and sampling of sites in varied topographical and ecological locales with a view toward preliminary reconstruction of prehistoric subsistence-settlement systems; (2) the location and test excavation of buried archaeological deposits with sufficient depth to warrant future archaeological excavation; such sites and excavations are sorely needed in the region since a sound cultural sequence is lacking. Both of these endeavors have to be considered preliminary in nature, in that subsistence-settlement studies mean little without supporting chronological data or vice versa. In essence, this initial fieldwork at Chaparrosa Ranch was designed to recover as much data as possible, thus permitting us to begin a number of special studies, as well as plan future investigations in the study area.

The techniques and methods used in the course of the fieldwork will be detailed in the final report. Test excavations were conducted, controlled surface sampling of several sites was done (with complete samples obtained from a few of the sites), intrasite activity areas were noted, and archaeological transects were made across the major stream valleys in order to document sites in various locales.

THE SITES

The archaeological investigations at Chaparrosa Ranch resulted in the documentation of 58 sites; four sites had been recorded on a day-long inspection in August, 1969. A number of the new sites had been previously plotted on an aerial map of the ranch which was made available to me by Wayne Hamilton. Use of the aerial map during the survey greatly facilitated the accurate plotting of the sites and other features. Sites were found during archaeological transects of the stream valleys and through general survey in the ranch area. Each site was recorded on a standard form designed especially for the project; each was assigned a project number (for example: CH-18, or "Chaparrosa Ranch, Site 18"). At a later date, these designations were replaced by site numbers assigned by The University of Texas at Austin Archaeological Research Laboratory. Site CH-18 became 41 ZV 73 (41=state of Texas; ZV=Zavala County; 73=73rd site in the county).

After a site was recorded, one or more data-gathering procedures was implemented. For example, at four of the sites, test pits were dug. At site 41 ZV 83 (CH-28), a 1-meter square and a 1 x 2 meter unit were excavated to depths of 1 meter and 1.4 meters, respectively. At 41 ZV 82 (CH-27), two 1 x 2 meter units were dug to depths of 60 cm and 80 cm. Two 1.5 x 1.5 meter squares were excavated at site 41 ZV 11 (CH-14), reaching depths of 80 cm and 1 meter. At 41 ZV 113 (CH-59) a single 1-meter square was excavated to a depth of 1 meter. These excavations produced an abundance of cultural remains (artifacts, flake debris, faunal remains, charcoal, burned rock, mussel and snail shells) which are currently under analysis.

Controlled surface sampling of various types was used at several sites. At other sites, all cultural material (with the exception of scattered hearthstones) was collected from the surface. Other sites were sampled through selective collecting ("grab" samples).

Very preliminary studies of the sites show that most are located on the floodplain of major streams, or on low terraces bordering the streams. Many of these sites are extensive, situated on natural levees, and have buried deposits 1 to 1.5 meters in thickness. Sites are also situated on gravel terraces which rim the stream valleys. Most debris at such sites indicates use as short-term camps and/or chipping stations.

There were several sites found in the uplands. These include chipping stations on gravel hills, as well as small scatters of debitage and hearthstones in open, sandy country (perhaps short-term foraging or hunting camps).

It is apparent from the superficial analyses conducted to date that the main villages ("base camps") were situated in the floodplain, usually on natural levees adjacent to and paralleling the stream course; subsidiary sites (chipping stations, hunting and foraging camps, short-term occupation sites) are on gravel terraces and in the uplands. Examples of the various site types are described below:

Floodplain Village (41 ZV 83; CH-28)

The site is located on a long, low knoll (natural levee) near the east bank of Turkey Creek. There is heavy vegetation along the creek banks, consisting primarily of oak, white ash, Texas persimmon, huajillo, guayacan, granjeno, white brush and catclaw. The site area itself is rather open, with scattered small mesquites and guayacan. The site was divided into two parts. Area A (northernmost) is 150 meters long (north-south) and 60 meters wide. Minimal sheet erosion has exposed scattered flakes and hearthstones. Area B (southernmost) covers an area 80 meters long (north-south) and 40 meters in width. An old ranch road crossed this portion of the site leading to considerable gully erosion and the exposure of quantities of burned rock and debitage. Areas A and B are artificially separated by a 50 meter wide band of low vegetation.

On the first visit to the site, only Area A was inspected. For the purposes of collecting a surface sample, the site area was divided into north and south

halves and all debitage within each was collected. At a later date, I returned to the site with a two-man crew, and excavated Test Pits 1 and 2. Test 1 was a 1-meter square excavated to a depth of 1 meter, using 20 cm arbitrary levels. Test 2 was dug immediately to the west of Test 1. It was a 1 x 2 meter unit and was dug to a depth of 140 cm. Combining the data from the two pits, the following level descriptions have been prepared:

Level 1: gray-brown midden soil (alluvium) with much burned rock, lots of flakes, flecks of charcoal, fragments of mussel shell, and snail shells. Artifacts include a corner-notched arrow point, two triangular arrow points, an arrow point distal fragment, a small notched dart point (*Frio*?), and a biface fragment.

Level 2: midden soil continues, grading to a tan-brown at ca. 40 cm; soil is more granular. Decrease in cultural remains, although burned rocks, mussel shell fragments, charcoal flakes and snail shells still occur in some quantities.

Level 3: soil identical to Level 2. In Test 1, there was a continuing decrease in cultural remains. However, to the west in Test 2, there was an increase, including many burned rocks and flakes. A large charcoal sample was obtained from Test 2; associated was a concave based lanceolate dart point fragment (*Kinney*?).

Levels 4 and 5: essentially the same, with some increase in clay content of soil; lots of burned rocks, but few flakes; also snail shells, charcoal and mussel shell fragments.

Level 6 (Test 2 only): mostly a tan clay, with a few burned rocks; no charcoal; lower one-half of level is sterile.

Level 7 (Test 2 only): tan clay, compact and hard; sterile.

After the excavation of these units, a column sample of the soils was obtained from the north wall of Test 2. Both pits were backfilled. A profile of the north wall of Test 2 is shown in Fig. 2 of this report.

Site on Gravel Terrace (41 ZV 81; CH-26)

The site is located on what appears to be a gravel terrace remnant on the east side of Turkey Creek. Erosion of the terrace formation has created an east-west gravel ridge beginning just east of the creek. At the west end of this ridge is a small "peak" covered with siliceous gravels and extensive workshop (flintknapping) debris. Just east of the workshop, there are scattered burned rocks,

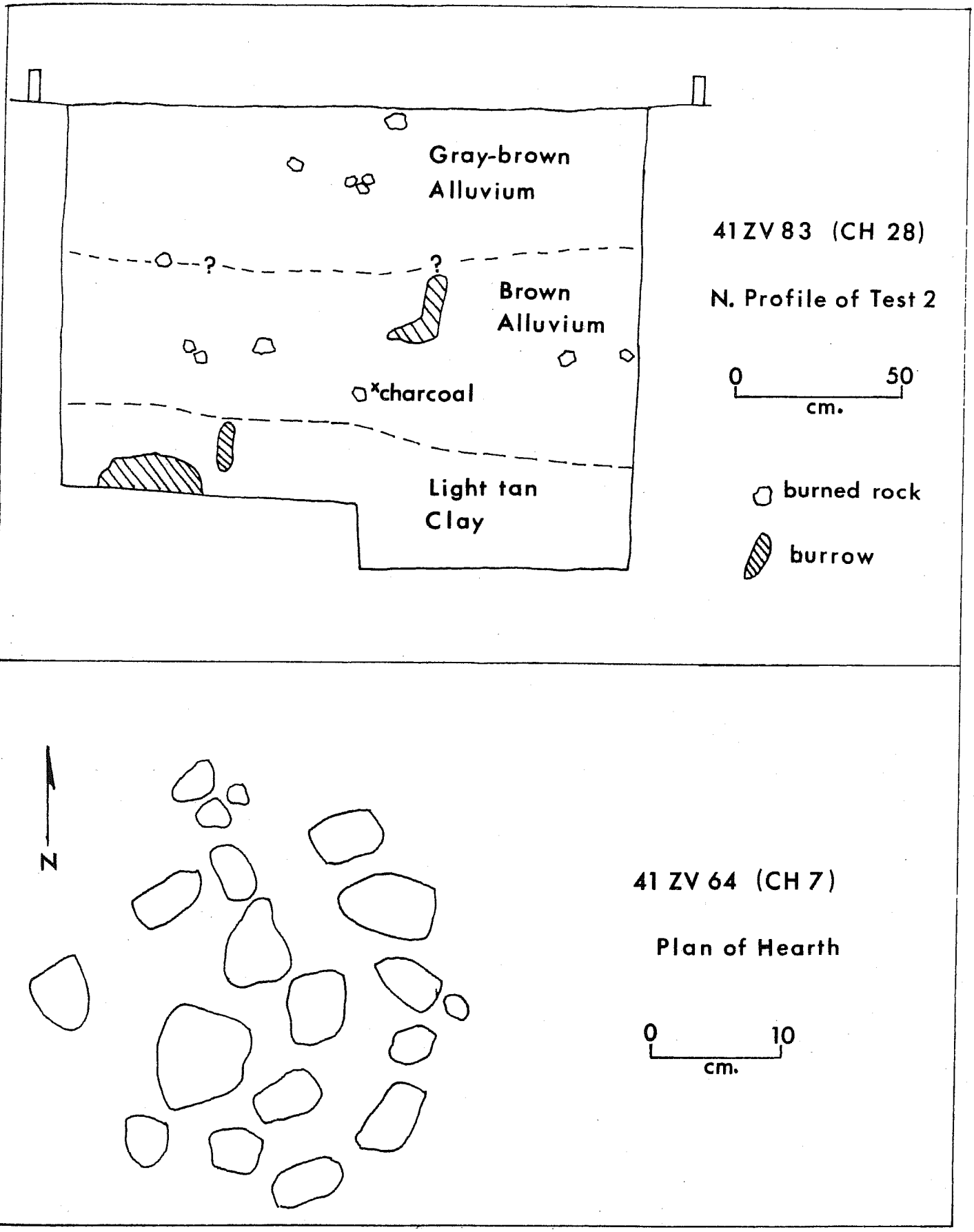


Figure 2. *Sites 41 ZV 83 and 41 ZV 64.* Upper, north profile of Test Pit 2, 41 ZV 83 (CH-28); lower, plan of hearth at 41 ZV 64 (CH-7).

flakes and artifacts on a "desert pavement" surface. Artifacts collected included the basal fragment of an *Angostura* point (Fig. 3,c). It is felt that if cultural remains of Paleo-Indian occupations are present within the ranch area, they may be located on these high gravel terraces. The workshop at the western end of the ridge may be related to a large village site on the floodplain below (41 ZV 82; CH-27).

Uplands Site (41 ZV 90; CH-35)

The site is located in broad grassy uplands, on a red sand hill about three miles west of Chaparrosa Creek. There is no visible water source in the vicinity. Exposed remains consist of several flakes and a core-chopper around a small concentration of burned rocks (hearth). A very similar site is located to the northwest (41 ZV 89; CH-34). The limited amount of cultural material, as well as the position of the site, suggests that the area may have served as a short-term camp for a small foraging or hunting party. Another short-term campsite has been reported by Hill and Hester (1971) in western Zavala County.

A variety of intrasite features were recorded during the reconnaissance. Most common were concentrations of burned rocks, interpreted to be hearths. These hearths are mostly oval in outline and were built on the ground surface. Several were mapped and sectioned. A plan of a hearth at 41 ZV 64 (CH-7) is shown in Fig. 2. At most sites there were small concentrations of mussel shells and snail shells. In most instances, these are undoubtedly food remains; however, raccoons are known to gather mussels from creek bottoms and carry them up on the floodplain, and roadrunners often have a special snail-cracking rock around which snail shells will accumulate (cf. Holdsworth 1969:202).

Other intrasite features include chipping loci (concentrations of debitage) observed at several sites, a cache of limestone manos at 41 ZV 66 (CH-10) and a pit filled with ashes, charcoal and baked clay lumps at 41 ZV 82 (CH-27).

THE ARTIFACTS

Several hundred artifacts of chipped and ground stone were collected. In addition, a large quantity of flake debris (debitage) was recovered. Analysis of these materials is incomplete and detailed artifact descriptions are not presented here. A variety of artifacts present in the collections is shown in Figures 3-5.

Dart Points (Fig. 3,a-m)

Recognized dart point types include *Abasolo, Catan, Matamoros, Tortugas, Pandora, Frio, Ensor, Pedernales, Desmuke, Kinney, Carrizo, Langtry,* and *Angostura.* Included in the collections are a number of small, thick and stubby dart points which do not conform to any currently defined type; examples are illustrated in Fig. 3,i-j (see also Hill and Hester 1971). Miscellaneous unclassified

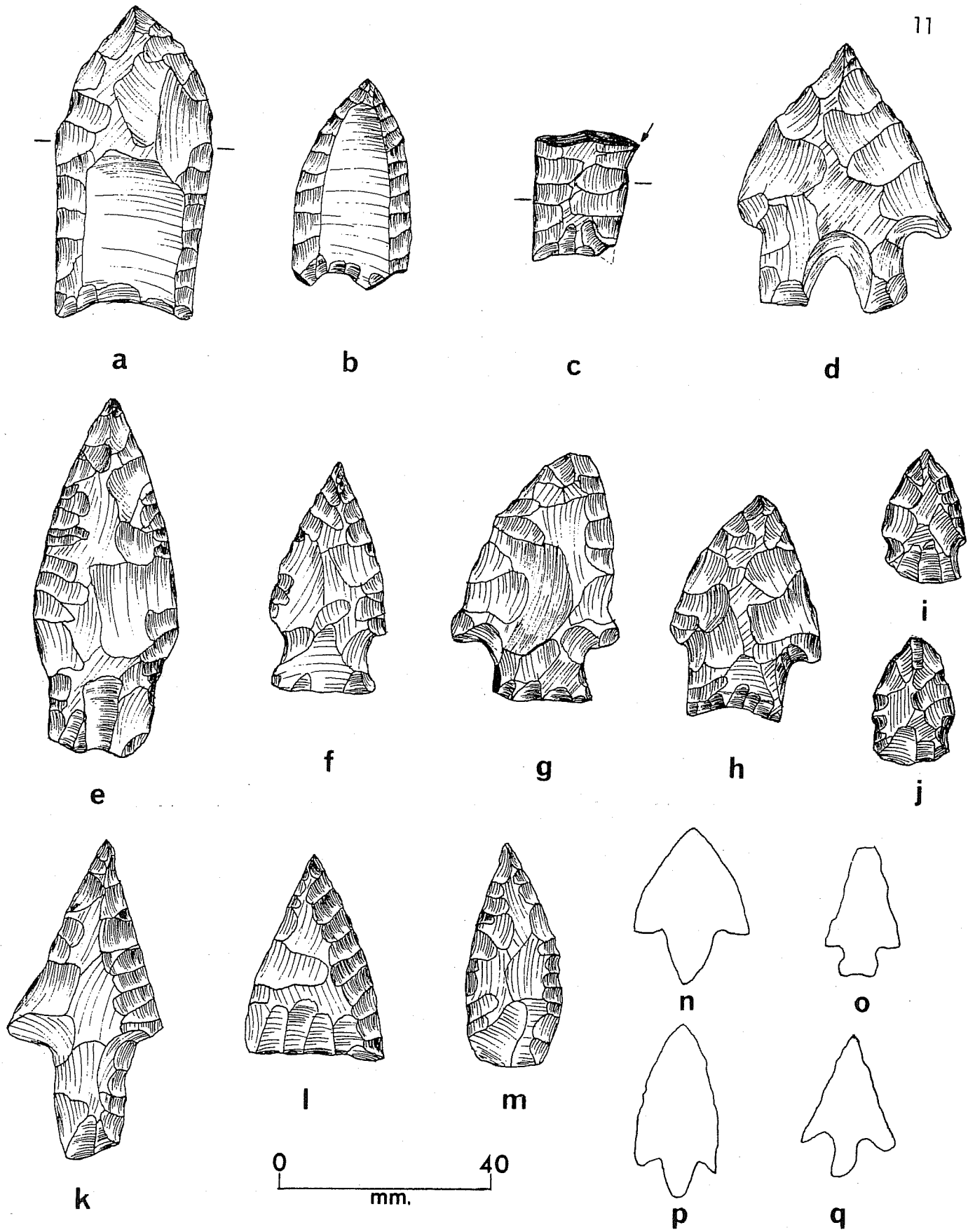


Figure 3. *Projectile Points from Chaparrosa Ranch and Vicinity.* a, *Clovis* point; b, *Folsom* point (both from northwest Zavala County); c, *Angostura* basal fragment, 41 ZV 81 (CH-26, arrow indicates burin facet); d-m, various dart points from sites on Chaparrosa Ranch; n-q, various arrow points from sites on Chaparrosa Ranch

corner side notched dart points are also present. During the course of the fieldwork, I observed the following dart point groups in private collections from the ranch area: *Uvalde, Bulverde, Scottsbluff, Marshall* and "Early Corner Notched" (cf. Hester 1971). Also present were several contracting-stem dart points similar to examples shown by MacNeish (1958:34-40) from sites in Tamaulipas.

Arrow Points (Fig. 3,n-q).

Very few were collected; several occurred in excavations. These include *Scallorn, Perdiz,* and triangular forms. *Edwards* arrow points (Sollberger 1967; Hester 1970b) are present in private collections.

Other Bifaces (Fig. 5,a)

These include ovate, triangular and lanceolate bifaces which could have functioned as knives. Some are obviously preforms (thick rough-outs), while others have been skillfully thinned and probably represent finished forms. Perforators are present, and a four-bevel knife was noted in a private collection.

Unifaces (Fig. 4,a-f)

A variety of unifacially chipped artifacts are present. Most are flakes retouched along the edges. Also represented are end-scrapers and side-scrapers showing varying degrees of use-wear. Among the most common unifacial tools are triangular gouge-scrapers (the *Dimmit* scrapers of Nunley and Hester 1966), a recurrent tool form in southern Texas (Hester, White and White 1969).

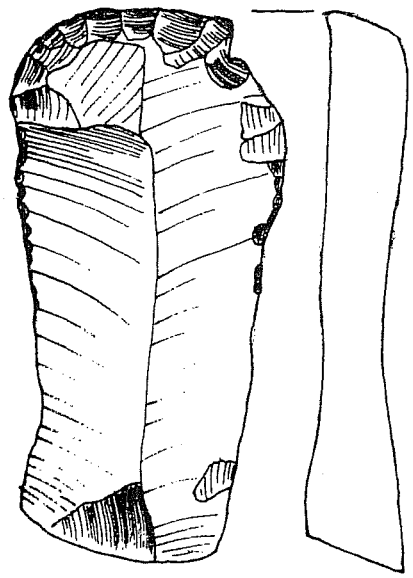
Cores (Fig. 5,b,c)

At least two forms are present: (1) simple prepared - a flint cobble is split, with the resultant fracture plane used as a platform for flake removal; (2) random bifacial - flakes are removed at random from both sides of a cobble, producing a large ovate bifacial form. These cores were used to obtain flakes suitable for manufacture into unifacial and bifacial tools (including projectile points).

Ground Stone Artifacts (Fig. 5,d,e)

Fragments of grinding slabs (metates) were found; a complete specimen is present in a private collection. Milling stones (manos) were found at a number of sites. Hammerstones were very common; pebbles of purple quartzite were preferred by the aboriginal flint-knappers. Two pendants (Fig. 5,e) are in private collections at the ranch.

Figure 4. *Unifacial Tools from Chaparrosa Ranch.* a,b, end-scrapers; c, side scraper made on cortex flake; dashes indicate extent of heavily dulled edge; d,d', both faces of a uniface; upper end has been removed by a transverse blow; blow probably intended as a resharpening technique; e,f, triangular gouge-scrapers.



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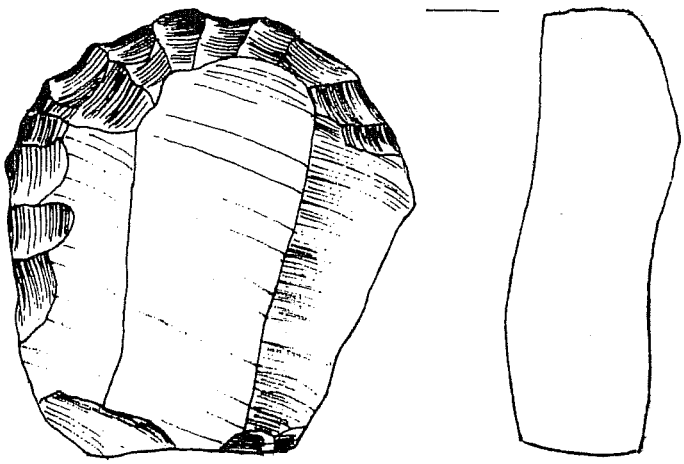

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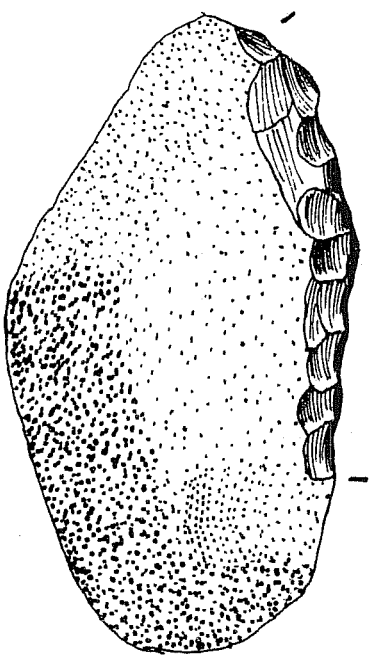

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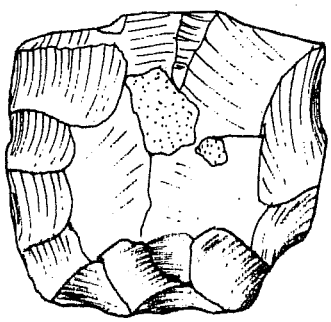

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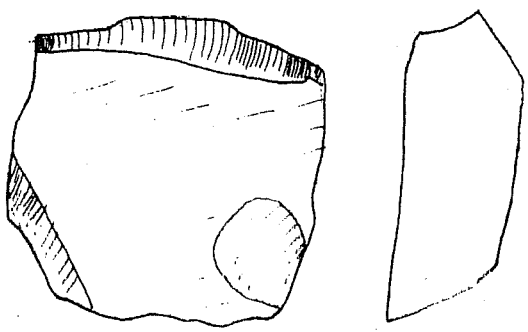

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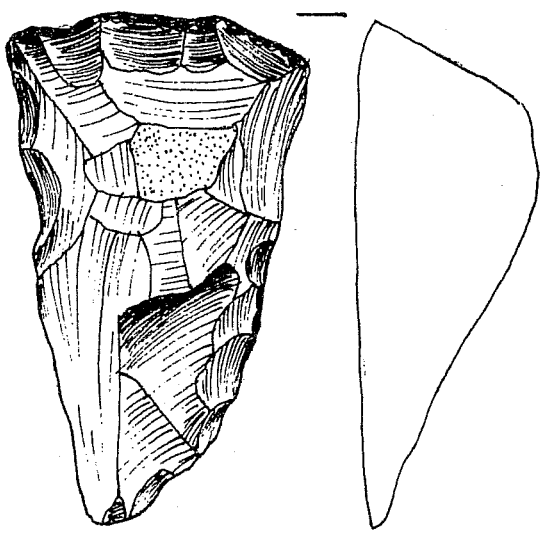

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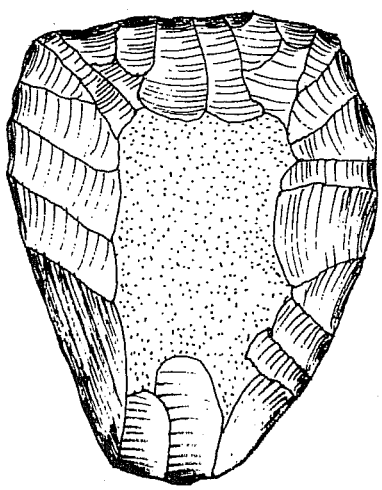

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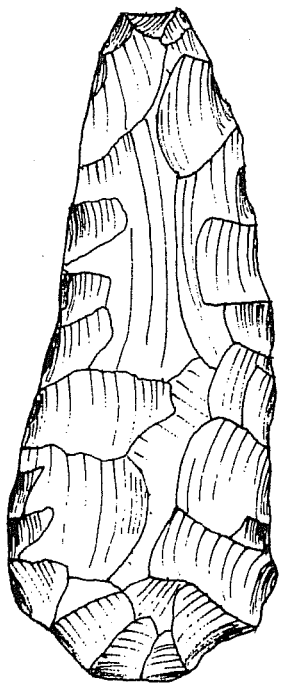
Figure 5. *Artifacts from Chaparrosa Ranch.* a, thick biface (probably a preform); b,b', prepared platform core; b' is a view of the platform; c, one view of a random bifacial core; d, quartzite hammerstone; blackened areas indicate battered portions of the piece; e, fragmentary pendant of tan limestone.



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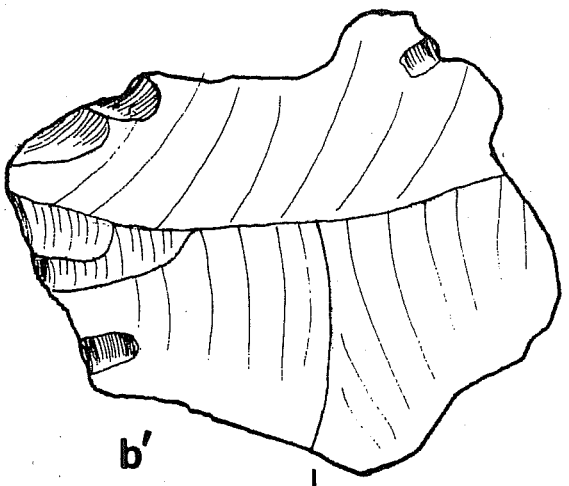

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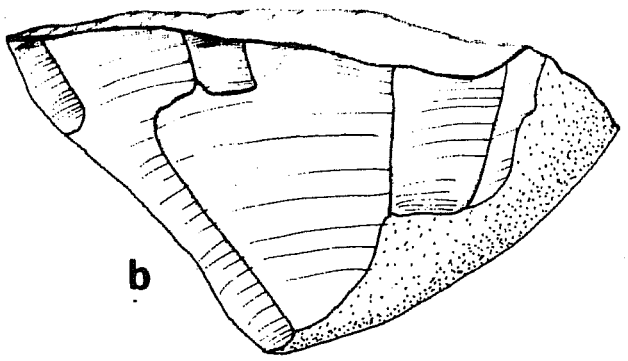

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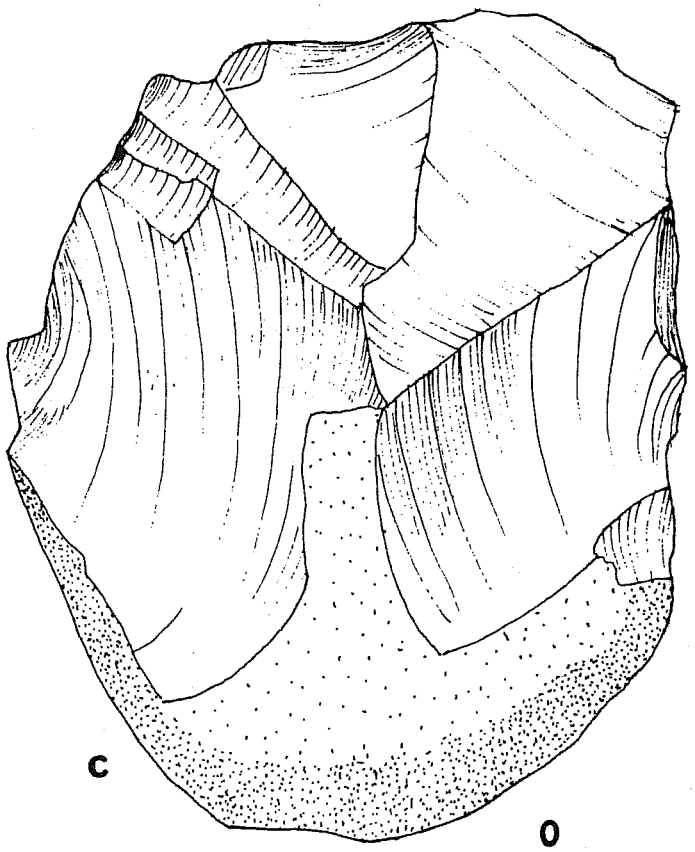

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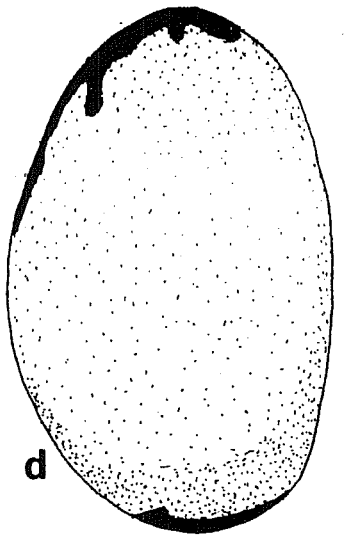

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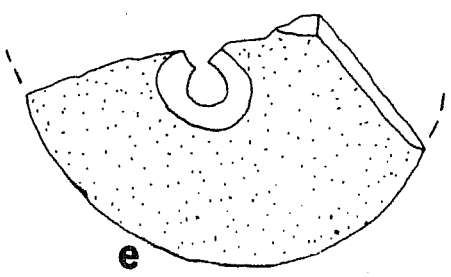

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CONCLUDING STATEMENT

The archaeological investigations carried out at Chaparrosa Ranch in the late summer of 1970 have been briefly summarized. Background data on past and present environments, ethnohistory and regional archaeology have been presented. Research goals and methods have been outlined and preliminary analyses of site and artifact data have been discussed. Full interpretation of these data will be given in the final report.

The two primary goals set for the initial phase of research have been met; sufficient controlled data were obtained for preliminary subsistence-settlement studies and a number of sites with buried deposits were located, with four of the sites test-excavated. The analysis of the information that we now have will permit the formulation of additional research problems. For example, large-scale excavation programs are needed at several sites in the floodplains of Turkey and Chaparrosa Creeks. Intact archaeological deposits are rare in southern Texas (Hester 1969) and the sites at Chaparrosa Ranch offer great potential. Much additional reconnaissance is needed in the Chaparrosa, Turkey and Palo Blanco stream valleys, and on the terraces and adjacent uplands. We were able to sample portions of these stream valleys, but continued survey will give us detailed information on aboriginal use of the land and environment.

Archaeological materials and documentary data resulting from the fieldwork are now on loan to the author. After preparation of a final report, the bulk of the artifactual material will, by prior agreement, be returned to the ranch. Documentary data (color slides, black and white photographs, maps, field notes) and a sample of the artifacts will become the property of the Texas State Historical Survey Committee.

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At Chaparrosa Ranch: Mr. B. K. Johnson, owner of Chaparrosa Ranch, very graciously permitted the archaeological research and cooperated in every way possible. Mr. Wayne Hamilton (business manager) was of especial help in supplying information on known sites and in arranging for research to be carried out in various parts of the ranch. Other assistance was rendered by Mr. Jack Youngblood (ranch manager) and Mr. Kley Johnson.

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CHIPPED STONE INDUSTRIES ON THE RIO GRANDE PLAIN, TEXAS: SOME PRELIMINARY OBSERVATIONS[1]

Thomas R. Hester

INTRODUCTION

The data presented here were obtained chiefly through the analysis of chipped stone tools and debris found at archaeological sites on the Rio Grande Plain of southern Texas. Many of the data result from problem-oriented investigations conducted on the Chaparrosa Ranch in Zavala County (Hester 1970; Hester and Hill 1971). Work at this study area was supported by grants from the Graduate Division, University of California, Berkeley, and the Texas State Historical Survey Committee, Austin (Curtis Tunnell, State Archeologist). It is my belief that the general statements regarding lithic technology made in this paper are broadly applicable to the Rio Grande Plain area, but there are certainly local manifestations or variations which remain to be defined. This is a preliminary report because: (1) the continuing study of stone technology in the area may modify some of the initial concepts expressed here; (2) the lack of firm chronological control makes it impossible to document the development of, or changes in, the stone industries through time; (3) there are no comparable controlled collections of lithic materials from other parts of the Rio Grande Plain.

FABRICATION PHASES AND THE CHIPPED STONE INDUSTRIES

It is most useful, I think, to consider the chipped stone technology of this region as a segment of the total aboriginal cultural system which operated there in prehistoric and early post-contact times. Collins (1971) has proposed a linear systems model which can be effectively used in the study of lithic technology in a given region (for a similar model, see Kobayashi 1970). It permits the archaeologist to trace the multi-stage progression within the stoneworking system. One can use a model of this sort to examine a stoneworking technology, from the acquistion of raw materials to the ultimate discard of the tools. Here I will use but a portion of Collins' suggested model, which I have modified to consist of three phases dealing primarily with the fabrications processes. Detailed statements regarding the use, reworking and discard of tools must await the completion of studies now underway. In addition, it is impossible with our current information to adequately articulate the chipped stone industries (discussed below) with the three phases.

Phase I in this model involves the procurement of raw materials. In the Chaparrosa study area, the major stream valleys are flanked by high gravel-covered terraces. These gravel exposures consist largely of rounded and weathered cobbles of chert, and occasionally petrified wood. Our study of the

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settlement system in this area has shown that occupation sites are confined to a rather narrow zone on the floodplains, particularly on natural levees paralleling stream channels. Siliceous raw materials are not present on the alluvial floodplains and so the terrace exposures had to be exploited for chippable stone. Flintknappers would leave the occupation sites and use locations on the terraces as workshops.

These workshop activities form the basis for *Phase II*. Once a workshop (chipping station) had been established at a spot on the terrace, the initial working and shaping of the raw materials was begun (using hammerstone percussion techniques). The exposed gravels are highly varied in texture, and the archaeological evidence indicates that the flint-knappers "tested" many cobbles by removing one or two flakes. The collections obtained from terrace workshops at Chaparrosa Ranch suggest that activities could take at least two directions: (1) the roughing-out of cores; these were then taken back to the occupation sites for the removal of flakes to be used as blanks for tool manufacture; (2) the manufacture of preforms, i.e., of roughly-shaped bifaces intended for further reduction and shaping, and use as knives, points or other tools. Both activities are reflected by the high incidence of decortication flakes. These are flakes removed from the outside of a cobble, and have their dorsal surfaces entirely covered with nodular cortex (they are usually referred to in the literature as "primary cortex flakes"). Further shaping of both cores and preforms is represented by flakes with dorsal surfaces retaining some cortex, but showing one or more previous flake removals ("secondary cortex flakes").

Based on the analysis of workshop debris (and lithic debris from the occupation sites), I have recognized two major flint-knapping technologies or industries, and possible indications of a third. The first can be termed a flake industry in which both prepared and unprepared cores were worked to obtain suitable flakes which could then be fashioned into tools of various sorts. Our data indicate that the shaping and perhaps the removal of flake blanks was carried out at the terrace workshops; most often, roughed-out cores (core preforms) were taken down to the floodplain occupation sites for the production of usable flakes.

The prepared cores can take several forms. Most common is a simple prepared core formed by the halving of a cobble (Fig. 1,a) and the use of the resultant broad fracture surface as a striking platform. Once the platform had been established, flakes were detached around the circumference by direct hard hammer percussion. Roughly conical polyhedral cores often result (Fig. 1,b-e).

Another type of prepared core has a multifaceted striking platform. The surface appears to have been obtained much like those just mentioned, but further preparation was done in the form of faceting (e.g., through the removal of a number of flakes across the platform). Two variants are represented. One has what might be termed a "horizontal" striking platform, often forming an 80° angle with the sides (Fig. 2,b). The second variant has an oblique platform, with angles ranging between 50° and 60° (Fig. 2,c,e). We can speculate that the presence of these two forms represents some differences in the flake-removal technology. For example, Bordes and Crabtree (1969) have suggested that perhaps the most efficient way to work a core with an oblique platform is by indirect percussion with the use of a punch.

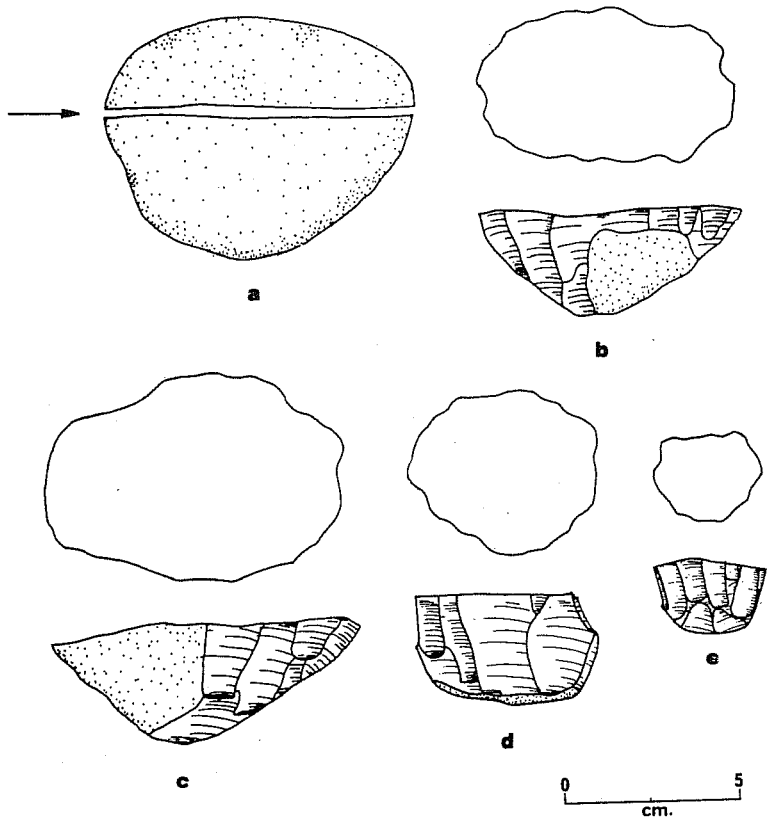

Figure 1. *Flake Industry Core Preparation and Representative Cores.*

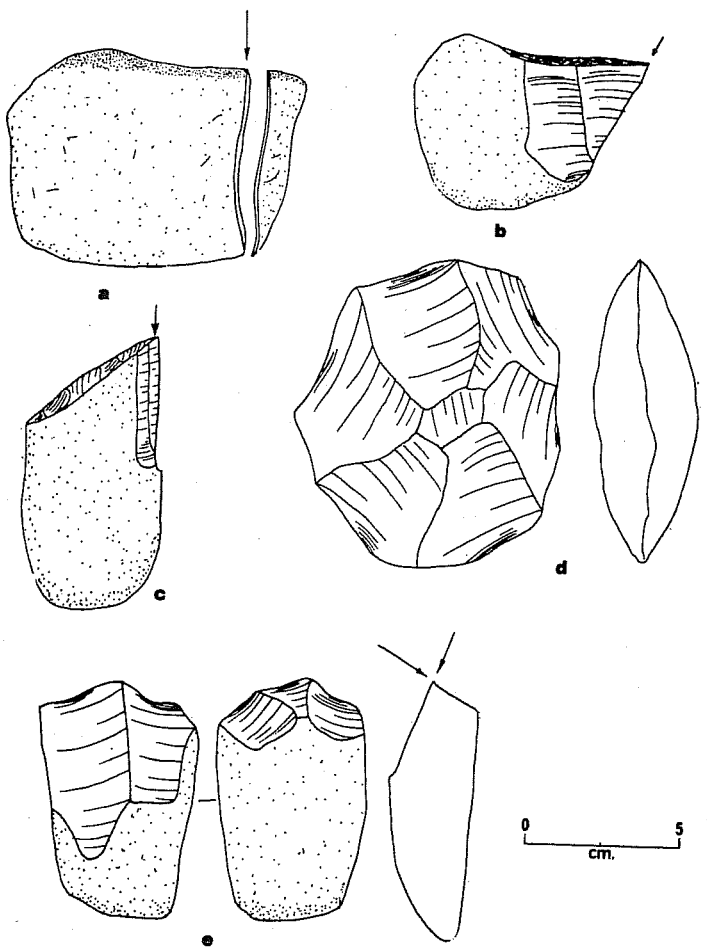

Figure 2. *Flake Industry Core Preparation and Representative Cores.*

There are also ovate bifacial cores (Fig. 2,d). Some appear to have been randomly worked and have multidirectional flake scars. Others have undergone careful preparation; these were edge-struck, much in the manner that a biface would be thinned (cf. MacDonald 1968).

Unprepared cores are sometimes found (Fig. 2,a). A flat cortex surface was used as a natural striking platform and flakes were detached by hammerstone percussion.

The flakes obtained through the reduction of both prepared and unprepared cores were used in a variety of ways. Some were marginally-trimmed for use as light duty cutting and scraping tools. Others were converted into tools such as projectile points, knives, gravers, perforators, and scrapers. In the manufacture of end scrapers, the sample from Chaparrosa Ranch reveals an aboriginal preference for long, blade-like flakes with two median ridges. The distal ends of these flakes were trimmed to a convex working edge; occasionally, the bulb of percussion was removed.

Acknowledging our lack of temporal control, I believe that the data from Chaparrosa Ranch indicate that this flake industry has considerable antiquity in the area. Many tools of the local Archaic (preceramic) period are made on flakes, and the Archaic occupation sites yield both prepared and unprepared flake cores. The flake industry is most prominent, however, in the Late Prehistoric era probably beginning after A.D. 1250. Arrow points are made on flakes, as are gravers, perforators, and some scrapers (a number of the Late Prehistoric scrapers, particularly end-scrapers, are made on blade-like flakes).

The second major stoneworking industry involves the manufacture of tools through the bifacial reduction of cobbles, and can be termed either a *core-tool* or *cobble industry*. In it, selected cobbles were bifacially-reduced to produce a variety of implements, including projectile points, knives, chopping tools, and large scrapers. Experiments by J. B. Sollberger of Dallas (personal communication) have shown that in order to effectively reduce a cobble into a bifacial tool, the selected cobble must be thin and tabular. Evidence of a core-tool industry in the Chaparrosa area comes from heavy chopping tools made on cobbles, from bifacial tools retaining patches of cortex on both faces, and from numerous preforms broken during the reduction process (these are found at both workshop and occupation sites). It is apparent that if a cobble is completely bifaced, removing all cortex, it is impossible to determine if the finished implement was made on a cobble or from a flake blank. Parker Nunley (personal communication) informs me that he has distinguished two distinctly different core-tool traditions in the Falcon Reservoir-Laredo area.

Yet a third industry, based on a *core-blade* technology, may be present in parts of the Rio Grande Plain. Thus far, occupation sites at Chaparrosa Ranch and in adjacent areas have yielded occasional blades and blade fragments, tools made on blades, and rarely, polyhedral blade cores. The best estimate at this moment is that these materials date primarily from the Late Prehistoric period. It is significant, I believe, that a well-developed core-blade technology was present on the southern Texas littoral in Late Prehistoric and

Protohistoric times. These materials are currently under study by H. J. Shafer and the author. Cores were made on small cobbles obtained from inland sources, and blades were detached at an early stage of core reduction. This is indicated by the presence of nodular cortex on a high percentage of the blades (43% in the sample from the Kirchmeyer site in Nueces County). The blades are most frequently modified by trimming along one or both lateral edges. At some sites, they were shaped into end-scrapers and projectile points. Wear pattern analyses indicate that the laterally-retouched pieces functioned as knives. The techniques used in the production of the coastal blades are not immediately apparent. A few have lipped or overhanging striking platforms and diffuse bulbs of percussion, suggesting the use of a soft hammer in detachment (Epstein 1964). However, most of the blades have small platforms and distinctive bulbs; Honea (1966) has suggested that indirect percussion (with a punch) may have been the method used for removing such blades.

Phase III in this model involves the shaping, trimming and completion of lithic artifacts. This phase was carried out at the floodplain occupation sites using flake blanks obtained from cores or preforms brought down from the terrace workshops. Flakes could be shaped by bifacial thinning and then finished by trimming (completed forms consist of projectile points, knives, perforators, etc.). Preforms were further reduced by bifacial thinning and trimmed into final form. This shaping and trimming process, whether it began with a flake blank or preform, would involve several stages (Skinner 1971); however, we have not yet defined these stages for the materials from the Chaparrosa area. Flakes could also be shaped by unifacial chipping and trimmed into end scrapers (convex trimming of the distal end of a flake), side scrapers (trimming of lateral edges), notched pieces and gravers.

An examination of debris categories (and frequencies) at both occupation and workshop sites makes it apparent that different kinds of flint-working were done at each. The workshop sites (used in Phases I and II) are dominated by decortication flakes. Interior flakes, those removed from a shaped core, and thinning flakes are rare. At occupation sites (where Phase III took place), decortication flakes occur infrequently, with primary cortex flakes almost entirely absent. Instead, there are much higher percentages of interior flakes, some of which are large and represent blanks for tool manufacture; others are quite small, probably representing core trimming activities. There are also numerous thinning flakes. These are broad, thin flakes with lenticular faceted platforms which overhang slightly on the ventral face. Most are apparently the result of bifacial reduction. One special form is the "overshot flake", in which the thinning flake unintentionally carries across the bifaces and detaches a portion of the opposite edge. Excellent examples of these have been illustrated by Skinner (1971). A small percentage of biface thinning flakes from the Chaparrosa area have dulled striking platforms. In some instances, this dulling could result from wear on a biface (knife) edge, with the thinning flakes the simple result of resharpening. However, in most examples, the dulling probably represents striking platform preparation. It would be most difficult (if not impossible) to distinguish between use-wear dulling and platform preparation dulling in this case. There are recognizable resharpening flakes (detached from dulled uniface edges) found at Chaparrosa occupation sites (see Frison 1968 and Shafer 1970 for a discussion of uniface and biface resharpening methods).

Knapping techniques at the occupation sites include hard hammer percussion (direct free-hand), soft hammer or billet percussion, and pressure flaking. The latter was usually the final step in the fabrication of many implements, especially projectile points and other thinned bifaces.

The workshop and occupation sites also give us some concept of the flint worker's tool kit. Most common are small round to ovate pebbles of quartzite used as hammerstones. The flint workers in the Chaparrosa area (and elsewhere in this part of the Rio Grande Plain) appear to have had a distinct preference for purple quartzite pebbles (Hester and Hill 1972). These show battering at one or both ends. Although some bone tools survive in buried deposits at Chaparrosa sites, no objects we can interpret as cylinder-hammers or as pressure-flaking tools have yet been found. Soft hammers could have been made from wood, especially such hard wood as oak (cf. Bordes 1969), a species found commonly on the local floodplains.

INFERENCES BASED ON LITHIC ANALYSIS

While this preliminary multi-phase model enables us to follow the fabrication process of the stoneworking technology in the Chaparrosa area, we have used other methods of lithic research to obtain both settlement and behavioral data. The analysis of waste flakes and other lithic debris can provide information about site function. Earlier, we contrasted the flake type frequencies at terrace and floodplain sites, noting that the high incidence of decortication flakes at the terrace sites is probably indicative of the use of those sites as workshops. Also present in large quantities at these workshops were core fragments and roughed out cores. Different types of flakes occurred at the floodplain sites (such as interior flakes, thinning flakes, and tool rejuvenation flakes); taking into consideration the array of maintenance and exploitative tools (scrapers, knives, points, and others) at the floodplain sites, we can safely infer that they are occupation areas, probably base settlements.

Similarly, analysis of waste flakes and other chipped stone materials can give information on intrasite behavior. At site 23 (Chaparrosa Ranch), controlled surface sampling revealed that one portion of the site contained about 40% of the thinning flakes from the site, as well as all of the bifaces, biface fragments and preforms. This area was apparently a chipping locus, where finished tools were manufactured, using either flakes derived from cores and/or preforms. The presence of biface fragments (including dart point and knife fragments) suggests that implements (dart shafts, hafted knives) with broken flint components were probably being repaired or refurbished there, and the broken parts discarded.

At the Stewart site (41 ZV 121) on an adjoining ranch, a survey of the site surface revealed a distinct cluster of lithic debris within a 6-foot diameter. The concentration was collected and the debris analyzed. Sixty-three percent of the classifiable flakes are attributable to biface thinning activities, and we can safely infer that this was a chipping locus devoted to such endeavors. While this is an isolated case, the careful horizontal exposure of buried sites in this region should reveal similar activity loci which would be valuable in reconstructing intrasite behavior.

Such horizontal excavations might also reveal clusters of specific tool forms, indicative where certain tasks were carried out. Such clusters are occasionally noted on surface sites in this area. At site 41 ZV 57 (just west of Chaparrosa Ranch), a concentration of 17 triangular unifaces ("Clear Fork" tools) was found within an area 10 yards in diameter. There was no associated debris to indicate that the tools had been made at this spot; in fact, unfinished examples of similar artifacts were collected at a gravel terrace workshop just east of the site. While we can assume that this concentration of tools might result from special activity, we can only speculate what that activity was. In a recent paper, Hester, Gilbow and Albee (1973) have put forth the hypothesis that "Clear Fork" tools on the Rio Grande Plain were used in wood-working. This hypothesis is based on wear pattern analysis and comparisons of the wear pattern data with a number of experimental studies. Therefore, it is possible that this cluster of tools at 41 ZV 57 represents a spot where wooden tools were being shaped, perhaps projectile shafts, digging sticks or some other form of wooden equipment.

CONCLUDING STATEMENT

In this paper, I have attempted a review of what is currently known about the lithic technology on the Rio Grande Plain, and have particularly emphasized data obtained during settlement-subsistence studies at Chaparrosa Ranch, Zavala County (Hester 1970). Quantitative treatment of the lithic data will be published in the final report on the Chaparrosa investigations. Earlier, I alluded to the fact that we are presently unable to interrelate the defined chipped stone industries with the postulated fabrication phases. In other words, we cannot take each of the three industries and trace it through the series of phases. In essence, the linear model which is presented here is a generalization based on our current information. We will have to await further study of materials collected under controlled conditions before this model can be refined and completed.

ACKNOWLEDGMENTS

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SOME OBSERVATIONS ON ARCHAEOLOGY AT CHAPARROSA RANCH, 1974[1]

Thomas R. Hester

From June 4 to July 11, 1974, The University of Texas at San Antonio held its first summer archaeological field school at Chaparrosa Ranch, in northwestern Zavala County, Texas. Six graduate students participated and were enrolled in two courses, ANT 549 "Archaeological Field Course" and ANT 529 "Supervised Field Research."[2] The field school was directed by the writer. The archaeological investigations had four major objectives: (1) to provide training in archaeological field techniques for the enrolled students; (2) during the course of this training, to carry out excavations at a major Late Prehistoric campsite with a view towards obtaining information on intrasite (community) patterning of archaeological remains; (3) to continue the archaeological site survey initiated by Hester (1970) and, (4) to excavate test pits at several sites to obtain data on site content and the local prehistoric culture sequence.

As a brief review of the work carried out by the UTSA field school, I shall discuss some of the information obtained relating to these four major goals. The foremost goal of any archaeological field school is to provide intensive training for students beginning in archaeology. Of course, most of this training comes through field experience--the actual digging of a site. However, a great deal more is involved: the student has to adjust to the environment in which the field school is situated, the student has to learn to work with other members of the crew, and he or she must undergo a type of "conversion" in which the mind is trained to "think archaeology" at practically all hours of the day. There are also the rudiments of archaeology to be learned: recognizing and recording sites, proper methods of collecting artifacts from surface contexts, the techniques of excavation--from grid layout to mapping to backfilling (the latter being one of the more painful learning experiences).

The teaching of excavation techniques was combined with the investigation of a Late Prehistoric campsite, Chaparrosa 28 (Mariposa Site), extending over 200 meters on the east bank of Turkey Creek. At site 28, test pits dug in 1970 had revealed archaeological remains buried, in alluvium, up to one meter in depth. Radiocarbon dates obtained by the writer in 1971 indicate that the earliest occupations at the site took place around A.D. 550 (UCLA-1821E) and that perhaps the last habitation was ca. A.D. 1650 (UCLA-1821D; Hester 1974). In 1974, our excavations were carried out in a block of nine 2-meter squares. This large area was opened up in an effort to obtain a view of the horizontal distribution of cultural remains in one portion of the site. The excavation was slow and tedious. Digging proceeded with trowel and brush in 5 cm levels.

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[1]Reprinted from: *La Tierra*, Newsletter of the Southern Texas Archaeological Association, Vol. 1, No. 3, pp. 19-22. San Antonio, 1974.

[2]The students were: Feris A. Bass, Jr., Mary Frances Chadderdon, Jill Gates, Edwin S. Harris, Margarita Vazquez and Mary Wagner.

All artifacts in each level were left in place and were precisely plotted before being removed. This enabled the development of a series of "distribution maps" showing the patterning of archaeological remains across the excavated area. In addition to information on spatial patterning, some data were obtained on the local projectile point sequence. In general, the last occupations (surface to 20 cm) were characterized by the co-occurrence of a variety of projectile point forms, especially specimens resembling the *Perdiz* and *Scallorn* types; triangular and subtriangular arrow points; small, thick "dart points," some of the tentative *Zavala* points; and in a nearby test pit, at 40 cm, a *Tortugas* dart point. The far southern edge of the site, known as Area B, has a deep erosional cut, from which a number of "Archaic" stemmed points have been collected, especially *Tortugas* and *Langtry* specimens.

A third goal of the field school was to continue site documentation within the 65,000 acres of the ranch. This again was combined with student training--providing experience in site survey and surface collection techniques. As of 1970, 61 archaeological sites had been reported from the Chaparrosa Ranch; at the close of the field session, 102 sites were known. The sites include a large number of buried occupation sites along the stream channels (Turkey and Chaparrosa Creeks), flint workshops on gravel ridges paralleling the streams, occupation sites (some temporary and others of longer duration) on high elevations overlooking the streams, and small upland sites. Site records are on file at The University of Texas at San Antonio and duplicates will be placed in the site files at the Texas Archeological Research Laboratory, Austin.

Finally, a number of sites were tested to obtain information on site content and culture sequence, the latter being very poorly known in the southern Texas area. There were few surprises as far as site content. The occupation sites along the Turkey and Chaparrosa Creek drainages consist of a variety of debris (fire cracked rock, charcoal, flint flakes, snails, mussels, chipped stone artifacts, occasional animal bones) buried in gray-brown alluvium, overlying a tan-yellow basal clay.[3] One site which intrigued us was Chaparrosa 84. The site lies in an upland situation west of Chaparrosa Creek and was initially recognized through roadbed erosion which had exposed a small scattering of burned rock. Exploration of the site by the students led to the discovery of several small depressions. When a couple of these were trenched (in order to obtain a profile of the depressions; they were later determined to be the remains of old pack rat dens), large quantities of burned rock were exposed. Further test pits were opened up, always with the same results: concentrated burned rock at 15-20 cm, again at ca. 40 cm, and scattered burned rock continuing to a depth of 95 cm below the surface. No intact hearths were excavated. In studying upland sites in similar locales in 1970, I had concluded that they were all small, "temporary" sites, perhaps linked to hunting and foraging activities (Hester 1970). Test pits and shovel cuts at Chaparrosa 84, what I had considered a "typical" upland site, revealed deeply buried burned rock rather evenly distributed over an area of at least 70 square meters. The excavation of approximately six square meters of the site failed to produce any diagnostic artifacts; there were many pounds of fire-cracked quartzite and

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[3]The soils at the sites were studied by Dan Arriaga of the USDA Soil Conservation Service and his observations will be provided in a future report. From these sites soil samples were collected for palynological analysis, as part of the continuing effort to obtain further empirical data on pre-European vegetation patterns.

sandstone, a few flint flakes, a scraper and two or three mussel shells, and that was it. This is a completely different assemblage of debris (and a greater amount of burned rock) than one finds in the creek-side occupation sites. We can rather safely surmise that the quantity of burned rock at the site results from some "special activity," perhaps the cooking or roasting of some type of food resource, but we are no farther along as to learning what that activity might have been. The local vegetation has been greatly altered by rootplowing and chaining, and was changed even before that by the "mesquite invasion" of the past 300-400 years. This upland locale may have been an area in which some particular plant assemblage was exploited, but it will be difficult to determine what this food resource might have been.

As far as learning more about the culture history of the area, we gained a little more knowledge through our test-pitting program. From test pits at a number of sites (CH-91, CH-79, CH-9, CH-5, and others), we were able to confirm the placement of the *Zavala* series of projectile points.[4] They originate prior to the introduction of *Perdiz, Scallorn* and triangular arrow points but persist in use along with these. One site, CH-91, indicates that *Frio*-like points precede *Zavala*, with "Archaic" points, such as *Tortugas, Langtry, Montell,* and others coming earlier in time.

Another aspect of the site documentation and testing program was the analysis of hearths. At most of the sites, occupational remains are buried and hearths are only occasionally exposed. However, a number of hearths were found and mapped, the area around them collected, and details of hearth construction recorded. One particularly large hearth was excavated at CH-66 and debris collected around it (interestingly, projectile points and point fragments were clustered in one area at the southeast edge of the hearth). Recording of the hearth was facilitated through the use of a grid of 20 cm units superimposed over the feature.

I have mentioned here only a few of the results of the 1974 UTSA archaeological field school at Chaparrosa Ranch. A great quantity of field notes, artifacts, photographs, and other data await analysis before definitive statements about Chaparrosa archaeology can be made. In sum, I believe it was a successful field program, made much easier by facilities made available by Mike Dillingham (Alice, Texas) at the Eight Mile Mill hunting camp on the Chaparrosa. It was a good learning experience for the students (and the director!) and it produced a very substantial amount of information on south Texas prehistory.

Acknowledgments

We are very grateful to Mr. Belton Kleberg Johnson, owner of the Chaparrosa Ranch, for his permission to hold the field school at the ranch. Mr. Wayne T. Hamilton, Ranch Resources Manager at the Chaparrosa, aided us in innumerable ways. We are, of course, extremely appreciative of the support of The University of Texas at San Antonio (Dr. Peter T. Flawn, President), the University's

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[4]The *Zavala* series bears some resemblance, both in point morphology and temporal placement, to the *Figueroa* type of Johnson (1964).

Physical Plant (Mr. George Mangrem, Director), the College of Humanities and Social Sciences (Dr. Richard E. W. Adams, Dean), and the Division of Social Sciences (Dr. Thomas C. Greaves, Director). There were many others who were helpful to the field school in a variety of ways, including Mrs. Manerva Andrews, Dan Arriaga, Mike Dillingham, Drane F. Grant, Kathy Hamilton, Mr. and Mrs. T. C. Hill, Jr., Mr. and Mrs. Harvey P. Smith, Jr., Jamis Townsend, and the secretaries of the College of Humanities and Social Sciences.

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PREHISTORIC SUBSISTENCE AND SETTLEMENT SYSTEMS ON THE RIO GRANDE PLAIN, SOUTHERN TEXAS[1]

Thomas R. Hester

The Rio Grande Plain encompasses much of southern Texas, in the region between San Antonio and Brownsville. It is a semi-arid area, with the vegetation dominated by thorny shrubs and trees. This region and adjacent northeastern Mexico were occupied at the time of European contact by many small groups of hunters and gatherers (most of whom spoke dialects of the Coahuiltecan language). However, the prehistory of the Rio Grande Plain has not been intensively investigated by archaeologists; only limited excavation had been conducted and most research up until recent times involved site survey and documentation, the recording of private artifact collections, and distributional studies of artifact forms.

In 1970 a long-range investigation of prehistoric settlement and subsistence in the Rio Grande Plain area was initiated at Chaparrosa Ranch, western Zavala County. The original research design involved systematic site documentation, controlled surface collecting, test excavation, and the recording of ecological data. The ranch is drained by Chaparrosa and Turkey Creeks, major tributaries of the Nueces River. Both streams have large valleys, and field work was concentrated within these drainages. Since part of the research was to secure information on settlement distribution, numerous transects were made of the valleys, sampling archaeological remains in all microenvironmental situations.

Research was begun at the same time in a nearby area in association with T. C. Hill, Jr. Additional site survey, documentation of sites, and test excavations were concentrated along Tortugas Creek in eastern Zavala County. Emphasized in this research was the maximum recovery of faunal remains from excavated deposits.

As a result of the 1970 field work, as well as limited excavations carried out since then, a variety of archaeological data was accumulated. The bulk of these materials are chipped stone artifacts and lithic debris, being analyzed by the grantee. However, some of the collected remains required special study, and funds granted by the Society have been used for these purposes.

Since the prehistoric chronology of the Rio Grande Plain has been almost totally unknown, an effort was made through stratigraphic excavations to obtain charcoal samples for radiocarbon dating. Using grant funds, eight samples were processed by radiocarbon laboratories at The University of California, Los Angeles, and The University of Texas at Austin. These samples were from three Chaparrosa Ranch occupation sites, 41 ZV 11, 41 ZV 82 and 41 ZV 83, located on the floodplain of Turkey Creek and situated adjacent to the present stream channel. The radiocarbon determinations indicate that the earliest occupations

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[1]Reprinted, with minor changes, from *American Philosophical Society Yearbook, 1973*, Philadelphia, 1974. Report on Grant No. 6313, Penrose Fund, 1972.

at these sites (buried by one meter of alluvium) occurred around A.D. 500, and that intermittent habitation continued to ca. A.D. 1450 or later. These dates are of interest for settlement pattern studies, as they indicate that earlier sites are probably located elsewhere, apparently at a greater distance from the stream, and that human occupation within the past 1,500 years has been concentrated along the present stream. The dates are also important in ascertaining the temporal position of certain diagnostic artifacts in the area.

Another facet of research, particularly at Chaparrosa Ranch, was environmental change. The Rio Grande Plain is today a brushland, with most streams either dry or flowing only on an intermittent basis. However, early Spanish and American records indicate that these conditions came about comparatively recently. On the basis of these accounts, I have hypothesized that most of the area was a grassland savannah, with numerous perennial streams, and with woody vegetation concentrated along stream courses. The environment was radically altered by Anglo-European ranching and farming practices, and a concomitant "invasion" of mesquite and associated thorny shrubs from northeastern Mexico.

In an effort to learn more about the prehistoric environment, soil samples suitable for palynological analysis were collected at excavated sites on Chaparrosa Ranch. Initial examination indicated a potential for good pollen preservation. However, subsequent study of eight samples by Dr. V. M. Bryant, Jr. revealed that the samples were almost totally void of pollen. It is possible that some pollen destruction could have been caused by fungal attack, or, more likely, that the soil in the study area is strongly alkaline and has undergone severe oxidation.

Although the excavations at Chaparrosa Ranch failed to produce significant samples of animal bone refuse, abundant faunal remains were recovered from other sites in the area. These materials are crucial to learning more about prehistoric subsistence activities on the Rio Grande Plain. The most important faunal assemblage was obtained from excavations at site 41 ZV 155, a Protohistoric site in the Tortugas Creek drainage. A variety of fauna were identified, including antelope, bison, deer, rabbits, rats, mice, snakes, turtles, fish, fox, gophers, and marmot. Of particular significance is the occurrence of antelope, the predominant species at the site. Antelope was recorded in early documents, but has been absent from most parts of southern Texas for 200-300 years. The species did survive in open, savannah-like areas of southern Texas as late as the mid-nineteenth century. Thus, the antelope may serve as an indicator of savannah conditions in the study area during Late Prehistoric times. The presence of bison is also of interest as this area is considerably south of the normal bison range. However, we do have nineteenth-century accounts of irregular bison intrusions into the region. Marmot, as documented at 41 ZV 155, is no longer found in this area.

In summary, grant funds were expended primarily for radiocarbon analysis and faunal identification. These data are currently being analyzed in more detail and will be presented in the final publication on the subsistence and settlement research.

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A SUMMARY OF THE 1975 ARCHAEOLOGICAL INVESTIGATIONS AT CHAPARROSA RANCH, SOUTHERN TEXAS*

Thomas R. Hester

In June and July 1975, the Field Course in Archaeology of The University of Texas at San Antonio returned to Chaparrosa Ranch to pursue the goals initiated in earlier fieldwork (see Hester 1974). Fieldwork in 1975 focused on block excavations at site 41 ZV 10 (Chaparrosa-9, originally tested in 1974; Harris 1974) and continued site survey and documentation. During this field session, survey work concentrated on specific terrain--the uplands and upland fringes--and those areas of the ranch which had been insufficiently covered during earlier surveys.

Twelve graduate students were enrolled in the course: L. C. Fletcher, E. S. Harris, Joseph and Wanda Kaufmann, T. C. Kelly, and Irma Richie (all of San Antonio), Barbara E. Wolf (Austin), Joan Melasky (Austin), Mary Damsgaard (Grinnel College), John Montgomery (Texas Tech University), Charles Moffatt (University of Pennsylvania) and S. W. Sandison (Sul Ross State University). We are grateful to ranch owner B. K. Johnson for his cooperation, to Wayne Hamilton (formerly the business manager at the ranch) for his continual assistance, and to T. C. Hill, Jr. (Crystal City) for his visits and help.

Research at 41 ZV 10

Site 41 ZV 10 (Chaparrosa-9) is located on the east edge of Turkey Creek, with archaeological deposits extending from the eroded edge of the floodplain westward for 50 meters. The site is approximately 200 meters long, oriented roughly north-south and paralleling the stream channel. As the floodplain breaks toward the creek, there are areas of erosion and some gullying. It was these exposures that revealed hearths and lithic materials and led to the documentation of the site in 1969. In general, however, the site deposits are undisturbed.

The site is buried in soils identified by Wayne Hamilton (personal communication) as Uvalde Silty-Clay Loam (see Smith *et al.* 1940:13-14). Riparian vegetation along the creek channel is dense, and is composed of mesquite and associated thorny brush, as well as Texas persimmon, oak and white ash. In recent times, the creek flows only after heavy rains; however, deep pools in the creek bed will hold water during dry weather for weeks and even months. One such pool was located adjacent to the site in summer 1975. It was about three feet deep and contained crayfish, mussels, small water snakes, and minnows. A favorite activity during the lunch break each day was crayfishing with string and dough-balls at this pool; this food resource (which must have also been readily accessible in prehistoric times) proved to be both abundant and, when cooked right, very tasty.

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*This paper is derived from several public lectures that were given on the 1975 investigations during 1976-1977.

Site 41 ZV 10 had been tested in 1974, at the time excavations were going on at 41 ZV 83 upstream. The four excavation units were scattered across the site and they served to indicate that the site was both deep (at least 80 cm of deposits) and contained considerable lithic debris and charcoal (Harris 1974).

Surface collections made at the site in 1969, 1974 and those present in the Wayne Hamilton collection, suggested that the site was Archaic in age. The test pits seemed to confirm this (e.g., a *Montell* point was found in one unit; Harris 1974), and the presence of abundant charcoal made the site appear quite promising in terms of learning more about the chronology of Archaic occupations in the study area. And, since the deposits seemed well preserved, there was every expectation that block, or open area, excavation would permit excavation of hearths and activity loci, and would yield additional data on intrasite patterning for the various Archaic occupations.

Therefore, in early June 1975, major excavations were initiated at the site. Work was focused on a flat, grassy area near the west-central part of the site. In this area, erosional activity just to the west had exposed hearths and lithic debris, and it thus seemed that the intact deposits in this particular locale had the potential for yielding hearths and areas of concentrated occupation. A datum point (designated N100/W100) was established at the south end of the site, and a base line was extended northward for 50 meters. A 100-square meter grid was laid out between N130 and N140 extending west to the W110 line; within this block (10 meters long on each side) 25 2-m^2 units were staked out. Eleven contiguous units were either fully or partially excavated during the season.

Excavations followed standard field procedures. Since the 1974 test pits indicated an absence of physical stratigraphy, vertical control relied on arbitrary levels 15 cm thick. Each unit was designated according to its grid location (coordinates at the southwest corner stake were used; e.g., N138/W102). Each 2-m^2 unit was divided into four 1-m^2 quadrants (NW, NE, SW, SE), thus permitting greater control over horizontal provenience for those materials not plotted *in situ*. All excavated deposits were passed through 1/4-inch and 1/8-inch hardware cloth. While the use of the smaller mesh often slowed excavations (especially when the soil was damp), it was more than justified by the extensive recovery of small animal bones. Because of the good preservation of faunal remains, matrix samples were taken and were subjected to flotation at the field camp. This led to the recovery of microfauna, tiny snails and some seed remains.

Nineteen features were recorded during the excavations and were numbered sequentially. Fifteen of these could be identified as hearths, and one consisted of a concentration of charcoal and large pieces of baked clay. The others were: a charcoal concentration, a concentration of baked clay pieces and a concentration of baked clay which possibly represented a small cooking pit. In terms of vertical distribution, the number of features occurred as follows: level 1 (2), level 2 (1), level 3 (12), level 4 (2) and one each in levels 5 and 6. Horizontally, the 12 features found in level 3 were fairly evenly scattered over seven units in the NW quadrant of the grid, but with a cluster evident in N138/W106 (a hearth, a charcoal concentration and a concentration of baked clay) and in N138/W108 (two hearths and a charcoal cencentration).

In terms of vertical distribution, the 12 features in level 3 were found between 24-45 cm, with most at the 30-35 cm level. Two soil units were disclosed by the

excavations. The upper, in which the archaeological remains were buried, is a grayish brown to dark grayish brown alluvium (Uvalde Silty-Clay Loam), with Munsell readings of 10 yr: 4/2 (dry) and 10 yr: 5/2 (moist). It was 45-60 cm thick, overlying a clay unit that contained only scattered cultural debris. Munsell readings for the clay varied from very pale brown (dry profile; 10 yr: 7/3-7/4) to brown (moist profile; 10 yr: 5/3). Excavations cut through the clay to depths of more than 100 cm below the surface.

In addition to the excavations at the site, the students also carried out controlled surface collecting in the northernmost part of the site. Five adjacent rectangular units, 7 meters long (east-west) and 5 meters wide (north-south), were laid out extending from the edge of the site, near the creek bank, to the east (over eroded areas). All surface materials within these units were collected. In addition, two surface hearths near the excavation area were mapped, and locations of a number of exposed surface artifacts were plotted.

Following completion of the excavations, profiles were drawn, including two long profiles--one 8 meters long on the N140 line, and one 6 meters long on the W106 line. Soil sample columns were collected from profiles and all units were completely backfilled.

The extensive faunal assemblage has been analyzed by Billy Davidson (Austin) and will be described in the final report. A list of identified species is presented in the Appendix.

A single radiocarbon date is available from the site. It comes from a sample obtained from a charcoal concentration found in level 4 of unit N136/W104. This *in situ* concentration was at a depth of 57.5 cm. The date is A.D. 1150 ± 40 (TX-2932). Using the MASCA correction tables (Ralph, Michael and Han 1973), the date is probably closer to A.D. 1210. Because of the occurrence of *Shumla*-like points at this approximate depth, I felt that the sample should be much older. However, of the seven dates now available from floodplain sites at Chaparrosa Ranch, none are any earlier than A.D. 490 (see Hester and Hill 1975; Montgomery 1978).

Numerous artifacts were found, and detailed descriptions and illustrations will appear in the final report. Temporally diagnostic projectile points indicate the presence of a Late Prehistoric occupation (or occupations) primarily in the upper 20-25 cm of the deposit; this late component had not been expected based on previous surface collecting and the 1974 test pitting program. Arrow points linked to the late occupations include *Perdiz* and *Scallorn*. A *Zavala* point was also found, as well as a triangular arrow point preform. A large, thin triangular biface was found associated with a hearth (Feature 1). *Perdiz* and *Zavala* points were also found in the second arbitrary level (15-30 cm), but appeared to come from the upper part of the level. There was a distinct occupation at roughly 25-45 cm, especially noted at ca. 30-35. It was elusive and practically impossible to trace horizontally; however, in profile, the occupation could be easily distinguished. Cultural affiliation of this occupation was not clear cut. However, apparently associated with the features and other debris at this depth were *Ensor*, *Zavala* and *Montell* (a single example) points, unifaces, cores and biface fragments.

Below, in levels from roughly 45-75 cm below the surface, earlier Archaic materials were found, but debris was not as frequent. Diagnostics include a *Marcos*

point, two *Shumla*-like points (of the heat-treated variety described by Hester and Collins 1974), a large perforator, cores, biface fragments, etc. At 92 cm, a large antler tine, probably used as a flaking tool, was found *in situ*. It began to deteriorate after exposure, and was treated with preservative before it was removed.

Other artifacts from the excavations included two grooved pieces of sandstone used either in manufacture of bone tools or edge preparation of bifaces preparatory to thinning.

Until further analysis is done, it is best not to offer any broad-ranging conclusions or speculations about the occupations at 41 ZV 10. The detailed data recorded on the features and associated materials will undoubtedly produce useful activity information, especially from the occupational zone in level 3. One significant aspect of the site which can be noted at this early stage is the contribution it makes to the building of a chronological sequence in the study area. Although the stratigraphy of the diagnostic materials is not clear-cut (as it rarely is in southern Texas), there is sufficient separation to distinguish Late Prehistoric components with *Perdiz* and *Scallorn* points and Late Prehistoric or Late Archaic components with *Zavala* points. The Late Archaic is represented rather clearly by distinctive *Ensor* points (and a single *Montell*), and there is an ostensible Middle Archaic occupation represented by *Marcos* and *Shumla*-like points. Potentially earlier occupations at the site may be present, given the occurrence of lithics, burned rock and the antler tine implement at depths of 90-100 cm.

In retrospect, we should have attempted finer vertical control in excavating the site deposits. Although there was considerable evidence of artifact displacement (rodent burrows, roots, soil cracks), the use of 5 or 10 cm levels might have allowed a better view of the stratigraphic positions of the diagnostic lithic materials.

Results of Site Survey Activities

As noted at the beginning of this paper, site survey and documentation was one facet of the field course. Earlier surveys in 1970 and 1974 had led to the documentation of 103 archaeological sites. Although a systematic effort had been made to sample various topographic areas within the ranch (e.g., by the use of east-west transects which cut across the Chaparrosa Creek and Turkey Creek stream valleys), we still did not have a very large sample of sites from the uplands and upland margins. This was particularly true of the eastern side of the Turkey Creek drainage. And, there were certain pastures within the ranch where only minimal survey work had previously been done.

The work schedule dictated that the mornings and early afternoons were devoted to excavations at 41 ZV 10. Following a lunch break and a respite from the heat in what shade could be found at the field camp, survey work was conducted in late afternoon. Survey teams were composed of 3-4 students each, equipped with the requisite materials for site documentation. If a particularly interesting site was found, it was later visited by all of the field school participants. As a result of the 1975 survey, 64 new sites were documented, bringing the total

number of sites at the ranch (both prehistoric and historic Anglo-European) to 167. It is my estimate that this represents something on the order of 65% of the potential sites to be found within the ranch boundaries.

Sites representing the entire known cultural span for the study area were documented, i.e., from Paleo-Indian through Late Prehistoric. A major Late Prehistoric site was found near the Chaparrosa Creek (Chaparrosa-150). It yielded surface materials that included *Perdiz*, *Scallorn* and *Zavala* projectile points, and a number of end scrapers. Another important site is Chaparrosa-138, found across Turkey Creek from 41 ZV 10 (Chaparrosa-9). Gullying had exposed a large concentration of baked clay and charcoal; the concentration was 38 cm long, 20 cm wide and 20 cm thick. Troweling revealed a cylindrical impression near the center, as if a log (?) or some other perishable had been encased in the clay. Adjacent to the concentration was a large bone fragment which appeared to be the head of a human femur and which was also burned. Around this feature was a zone, about 10 cm thick, of various materials, including baked clay lumps, land snails, some burned rodent and mammal bone fragments, scattered burned rocks and both burned and unburned flakes. The feature and related materials are within a midden deposit which is at least 60 cm thick. There is abundant cultural debris in the midden, including animal bones, mussel shells, land snails, large flakes and cores, hearthstones, etc. Cultural diagnostics included two *Scallorn* points, a subtriangular dart point and a stemmed dart point. It appears that both Late Prehistoric and Archaic occupations were present. Two 1-m^2 test units were also excavated; a *Perdiz* and an *Ensor* point came from these, along with materials similar to those just described.

Some very important settlement data came from several sites documented on the eastern uplands of the Turkey Creek drainage. At site Chaparrosa-159, a *Golondrina* point and a bifacial *Clear Fork* gouge were found. The site apparently has no depth; the surface materials date to ca. 7000 B.C. (cf. Hester 1978). At Chaparrosa-156, another *Golondrina* point was found, along with Pre-Archaic dart points ("Early Corner Notched", *Gower*), and a blade core (cf. Hester 1977). Chaparrosa-146 also yielded Pre-Archaic "Early Corner Notched" projectile points. These, and other upland sites, indicated that the upland areas were favored habitation and hunting localities in Paleo-Indian and Pre-Archaic times (roughly 7000-5000 B.C.). It is likely that the dendritic drainage pattern exhibited by Turkey Creek today reflects, in geomorphological terms, stream-cutting in the past 2000 years or so (see Hester and Hill 1975). However, it is not possible, with present dates, to identify the locations of earlier channels (these have, in all likelihood, been obliterated) or ascertain anything about their size.

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APPENDIX

IDENTIFIED FAUNA FROM EXCAVATIONS AT 41 ZV 10

The extensive faunal assemblage excavated at 41 ZV 10 had been completely analyzed by Billy Davidson of Austin, Texas. A detailed faunal study will appear in the final report. For the present, a list of identified species is provided below:

SCIENTIFIC NAME	COMMON NAME
Rana caresbeiana	bullfrog
Rana pipiens	leopard frog
Rana sp.	frog
Bufo sp.	toad
Terrapene sp.	box turtle
Phrynosoma sp.	horned toad
Elaphe sp.	rat snake
Couber sp.	racer snake
Pityophis sp.	bull snake
Agkistrodon sp.	cottonmouth
Crotalus sp.	rattlesnake
Natrix sp.	water snake
Thamnophis sp.	garter snake
Lepisosteus sp.	gar
Cnemidophorus sp.	whiptail lizard
Basariscus astutus	ringtail
Procyon lotor	raccoon
Mephitis mephitis	striped skunk
Citellus spilosoma	spotted ground squirrel
Sigmodon hispidus	cotton rat
Neotoma sp.	pack rat
Neotoma cf. *microps*	South Plains packrat
Perognathus sp.	pocket mouse
Geomys sp.	gopher
Sylvilagus sp.	cottontail
Lepus californicus	jackrabbit
Odocoileus sp.	deer
Odocoileus virginianus	whitetail deer
Artiodactyla	deer or pronghorn