ARCHAEOLOGICAL INVESTIGATIONS AT THE KENT CREEK SITE (41HL66): EVIDENCE OF MOGOLLON INFLUENCE ON THE SOUTHERN PLAINS

A Thesis

by

JIMMY BRETT CRUSE

Submitted to the Graduate College of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

December 1989

Major Subject: Anthropology

ARCHAEOLOGICAL INVESTIGATIONS AT THE KENT CREEK SITE (41HL66):

EVIDENCE OF MOGOLLON INFLUENCE ON THE SOUTHERN PLAINS

A Thesis

by

JIMMY BRETT CRUSE

Approved as to style and content by:

David L. Carlson
(Chairman of Committee)

Donald J. Pisani
(Member)

Harry J. Shafer
(Member)

Vaughn M. Bryant
(Head of Department)

December 1989

ABSTRACT

Archaeological Investigations at the Kent Creek Site (41HL66):
Evidence of Mogollon Influence on the Southern Plains.

(December 1989)

Jimmy Brett Cruse, B.S., West Texas State University

Chairman of Advisory Committee: Dr. David L. Carlson

Recent investigations at the Kent Creek site (41HL66) in the southeastern Texas panhandle and a number of other sites in the Panhandle Plains region allows for a redefinition of the Palo Duro complex and for its reassignment as a phase. The investigations at the Kent Creek site have revealed the remains of two functionally distinct pithouse structures, the first to be associated with a site of the Palo Duro phase. These structures are very similar to Mogollon pithouses of the Southwest. Other features at the site include hearths, storage pits, and a burial. The artifact assemblage contains such diagnostics as Scallorn and Deadman arrowpoints, Ellis dart points, and Mogollon Brownware ceramics.

Based on the investigations at Kent Creek and at other sites of the Palo Duro phase, it is apparent that the indigenous populations of the Southern Plains were being significantly influenced by the Mogollon during most of the first millennium A.D. Groups of the Palo Duro phase may have served as intermediaries between the Mogollon and Plains cultures.

ACKNOWLEDGMENTS

The investigations at Kent Creek could not have been completed without the efforts of a number of individuals. Louise Barton and Roy Jean Stephens, the landowners, permitted unlimited access to the site and their continued interest has been greatly appreciated. A special thanks goes to the members of the Panhandle Archaeological Society (PAS) who participated in the excavations at the site. Several of the PAS members gave up their weekends to help with the excavations and without their efforts the work could not have been accomplished.

To Dr. Jack T. Hughes who encouraged and nurtured my interest in Texas archaeology and who offered invaluable insights to many of the problems encountered during the excavations, I offer my sincerest thanks. Thanks is also given to Douglas K. Boyd who took time out from his busy schedule to work many long, hard hours at the site. His continued encouragement and persistence for me to finish the thesis was welcomed and appreciated. A very special thanks is given to my wife, Maria Elena Cruse. She was involved in every phase of the thesis, from fieldwork to laboratory analysis to editing of the manuscript. Without her continued support the thesis would not have been completed.

Several individuals were involved in the specialized analyses. John Hedrick of the El Paso Archaeological Society conducted the ceramic analysis. John Jones, Barry Baker, and Beth Miller, graduate students at Texas A&M University, conducted the pollen, faunal, and skeletal analyses, respectively. Paula Cook and June Brennan drafted the figures and Tracy Millis took the artifact photographs.

Also, I would like to acknowledge the Radiocarbon Laboratory at the Balcones Research Center in Austin for running the radiocarbon samples and providing one of the dates at no charge and the Texas A&M University Archaeological Research Laboratory for providing funds for one of the samples.

Finally, I express my gratitude to my thesis committee. Dr. David Carlson, Chairman, was always available for advice and support. Committee members Dr. Harry Shafer and Dr. Donald Pisani were equally as helpful. To the members of the committee and to all of the individuals mentioned above, I offer my sincere appreciation and thanks.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF FIGURES

LIST OF FIGURES (Cont'd)

LIST OF TABLES

LIST OF TABLES (Cont'd)

CHAPTER I

INTRODUCTION

The Palo Duro phase of the Panhandle Plains region of Texas is a Ceramic Period manifestation occurring primarily in the broken country of the upper Red River drainage but also in the breaks of the Canadian River. This phase was first identified and defined by Hughes and Willey (1978) as a cultural complex on the basis of their excavations at the Deadman's Shelter in Mackenzie Reservoir on Tule Canyon, a major tributary of Palo Duro Canyon. Since their definition of the complex, a number of other sites in the region with similar remains have been investigated and the complex can now more properly be classified as a phase. This phase will be defined in detail in Chapter III. Briefly, however, the phase is marked by a combination of Mogollon plain brown pottery and a distinctive arrowpoint type called Deadman. These items are often accompanied by Scallorn arrowpoints. The Scallorn point has been considered indicative of the Southern Plains Woodland stage (Lintz 1976).

This thesis follows the style of American Antiquity.

The Plains Woodland is generally seen as a distant expression of the eastern agriculturalists as these cultures flourished and spread westward into the fertile stream valleys of the Great Plains during the early centuries A.D. It is generally believed that Plains Woodland cultures gave rise to the Plains Village cultures that developed several centuries later (Wedel 1961).

On the Southern Plains, the Woodland culture has been recognized archaeologically in northwestern Oklahoma and as far south as the Canadian River in Texas (Couzzourt 1982). Although a Plains Woodland complex has not been recognized south of the Canadian River, the Palo Duro phase is in many respects very similar to it.

Recently, however, the applicability of the term "Plains Woodland" to sites in western Oklahoma and the Texas panhandle has been questioned by Baugh *et al.* (1984) and Moore (1986). As pointed out above, traditionally the concept of Plains Woodland refers to the belief that the use of domesticates and pottery were ultimately derived from people located to the northeast. At present, however, the earliest Plains site to yield maize is LoDaisKa near Morrison, Colorado, along the western margin of the Central Plains (Irwin and Irwin 1959). As Baugh (1986) has pointed out, this implies that Plains horticulture may have been highly influenced by Southwestern peoples.

Concurrently, the earliest site to yield pottery in the Southern Plains is the Deadman's Shelter site of the Palo Duro phase. Mogollon Brownwares were recovered from a midden deposit at this site which produced two radiocarbon dates of A.D. 120±60 and A.D. 210±40.

In comparing these ceramics to the sample recovered by Ferring (1982) from the Plains Woodland components in Delaware Canyon, Oklahoma, Baugh (1986) noted similarities in the tempering materials as well as the presence of smooth surfaces. This raises the question as to what the relationship was between the cultures of the Southern Plains, Eastern Woodlands, and Southwest during the early centuries A.D.

During the past two decades a number of sites assigned to the Palo Duro phase have been investigated (Hughes 1969; Wedel 1975; Etchieson 1979; Hughes and Willey 1978; Hays 1986). Though all of these sites have produced brownware ceramics, no structural remains or evidence of horticulture has been recovered. Consequently, it has generally been held that the Palo Duro phase represents groups of nomadic foragers who apparently were in contact with Mogollon groups to the southwest and Plains Woodland groups to the north. Hughes (n.d.) suggests that the Palo Duro cultures may have served as intermediaries between these two cultures and, if so, they may have carried ideas about houses and horticulture.

Evidence which may support Hughes' suggestion comes from archaeological excavations recently conducted at the Kent Creek site (41HL66) located in Hall County of the southeastern Texas panhandle (Figure 1). The excavations at Kent Creek revealed several features including the remains of two functionally distinct semi-subterranean pithouse structures. There is evidence that a third structure may be present but it was not explored. This represents the first evidence of structures to be associated with a site of the Palo Duro phase and

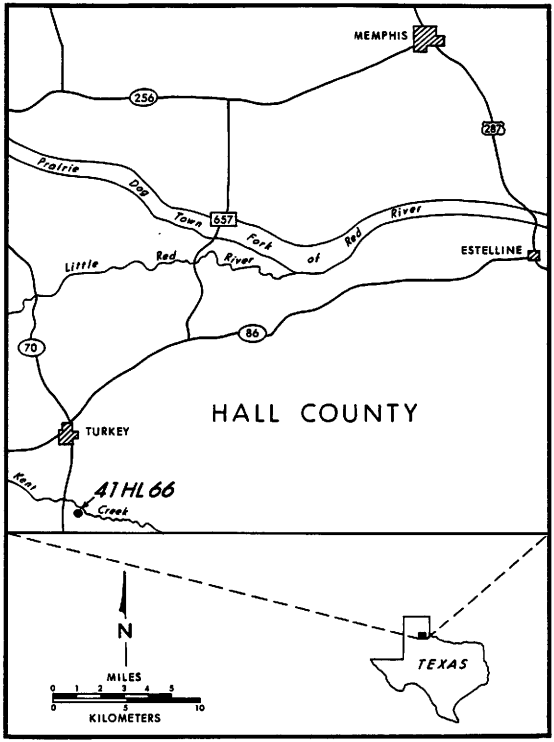

Figure 1. Location of the Kent Creek site in Hall County, Texas.

the structures appear to be similar to pithouses of the Mogollon region of the Southwest. Other features at the site include hearths, storage pits, and a burial.

The structures and features at the site call into question the idea that the peoples of the Palo Duro phase were simple nomadic foragers. The remains at Kent Creek may be an example of an adaptation by a previously transitory Plains society to a more sedentary existence.

DESCRIPTION OF THE KENT CREEK SITE AND THESIS ORGANIZATION

The Kent Creek site was recorded in 1980 by the author who identified the site as belonging to the Palo Duro phase. The cultural assignment was based on a collection of artifacts which consisted of brownware ceramics and Deadman and Scallorn arrowpoints. The artifacts were recovered from the north and south profiles of an abandoned road which cuts through the site. Both profiles displayed a dark ashy zone some 30-35 cm thick which suggested there were intact buried cultural deposits both north and south of the road cut. At that time the area south of the road cut was under cultivation which had disturbed part of the site in that direction. The area north of the cut, however, appeared to be completely intact. As the site appeared to have the potential to provide important data on the Palo Duro phase, it was chosen as the subject of this thesis and excavations were conducted at the site during the summers of 1985 and 1986.

This thesis presents the results of the excavations conducted at the Kent Creek site. The primary goals of this thesis are twofold. First, to present a detailed description and analysis of the archaeological remains from the site and, second, to provide a basis for examining the cultural influences on the Southern Plains during the first millennium A.D.

Chapters II and III describe the environmental and archaeological context of the Kent Creek site while the excavation methods and research design are presented in Chapter IV. Chapter V presents a discussion of the stratigraphy of the site and then describes the structures and features. The artifacts recovered are described in Chapter VI. Chapter VII synthesizes the data and the interpretations and conclusions drawn from the Kent Creek remains are presented. Finally, Appendix I is a detailed analysis of the skeletal material from the site and Appendix II is an inventory of the Kent Creek artifacts.

CHAPTER II

ENVIRONMENTAL SETTING

The cultural remains at the Kent Creek site cannot be understood without some knowledge of the natural conditions under which the inhabitants lived. This chapter describes the local and regional setting and then provides brief accounts of the geology, soils, climate, and biota in the vicinity of the site.

LOCAL AND REGIONAL SETTING

The Kent Creek site is located in Hall County, about 8 km (5 mi) southeast of Turkey, Texas. The site is situated on a ridge toe and covers an area of approximately 1400 square meters (Figure 2). Kent Creek, a small spring-fed tributary of the North Pease River, lies about 60 m to the north. The floodplain of Kent Creek, about 10 m below the site, surrounds the site on the north, east, and west and would appear to provide an excellent area for sub-irrigation horticulture. To the south the topography continues as a gradual rise until it meets the edge of the uplands of the Rolling Plains.

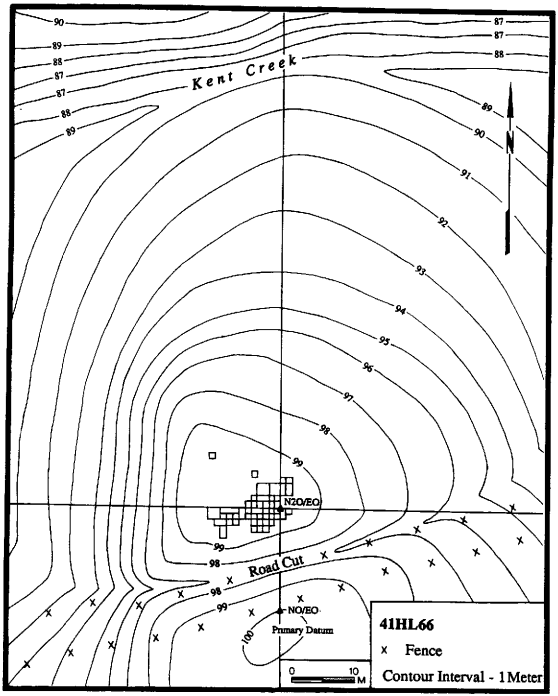

Figure 2. Contour map of the Kent Creek site.

This section of the southeastern Texas panhandle lies just below the eastern escarpment of the Southern High Plains or Llano Estacado, and on the western edge of the Texas Rolling Plains (Figure 3). The Llano Estacado is an elevated, relatively flat, short-grass plain that is for the most part internally drained. The drainage system consists mainly of playa lakes that average about one to the square mile (Bagot and Hughes 1979). The Llano Estacado is drained to the east and southeast by the headwaters of the Red, Pease, Brazos, and Colorado rivers and their tributaries.

The escarpment that serves as a boundary between the Llano Estacado and the Rolling Plains is in many places abrupt, especially along the upper branches of the Red River. This escarpment (locally known as the "Caprock") presents a distinct cliff which rises from 60 m (200 ft) to 150 m (500 ft) above the Rolling Plains (Rathjen 1973). The "breaks" along the escarpment are marked by a "badlands" topography with many ridges, steep slopes, peaks, and numerous deep valleys. The escarpment is most dramatically developed in Palo Duro Canyon where there is an almost sheer drop of 212 m (700 ft) to 242 m (800 ft) from the level surface of the High Plains (Gould 1906).

The Rolling Plains, which lie east of the escarpment, cover much of the southeastern portion of the Panhandle. They are elevationally much lower than the Southern High Plains and are characterized by heavily eroded topography. Locally, these plains are drained by the upper forks of the Red and Pease rivers. Vegetation is sparse on the Rolling Plains and is composed primarily of mesquite on the flats and

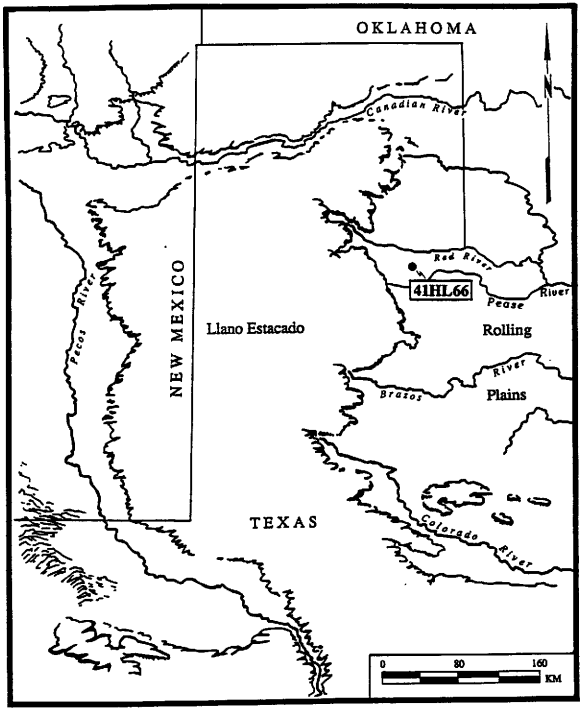

Figure 3. Relief map of the Llano Estacado and surrounding areas (after Loebeck 1957).

juniper in the canyons, with short range grasses and scattered clumps of cactus appearing throughout the area.

GEOLOGY

The oldest geologic deposits exposed in the area are composed of gypsiferous marine red beds of the late Permian Quartermaster Formation (Lloyd and Thompson 1929). The red beds emerged from swampy plains as the Rocky Mountains were thrust upward (Rathjen 1973). The red beds form many of the broad high benches characteristic of the Rolling Plains. These benches are held up by extensive undulating layers of gypsum. The soluble gypsum layers and the poorly indurated beds of red clay and silt are readily eroded which gives the Rolling Plains their "badlands" appearance.

Later in geologic time are the Tecovas and Trujillo Formations of the Dockum Group of upper Triassic age (Hughes and Willey 1978). The Tecovas is predominantly shale, the Trujillo mainly sandstone. The Trujillo is exposed as small lenses at a few places in the vicinity of the Kent Creek site. Extensive deposits of both formations are exposed along the eastern escarpment of the Llano Estacado about 25 km to the west. The widely utilized Tecovas jasper occurs in the upper part of the Tecovas Formation (Holliday and Welty 1981). Both the Permian and Triassic outcrops have sandstones which were utilized for grinding implements.

The Ogallala or Panhandle Formation (Gidley 1903) of Pliocene age caps the High Plains and sediments from this formation cover areas of the Rolling Plains. The Ogallala Formation varies in composition and

thickness from area to area. The sediments composing the formation range in texture from coarse gravels to clays. In this area, the Ogallala consists of coarse basal gravels to which the name "Potter" has been given (Patton 1923). The Potter gravels, which often are strewn over the bluff tops and along stream beds, contain a great variety of chippable material, including chert, quartzite, and silicified wood.

Most of the surface deposits of the Rolling Plains consist of Quaternary alluvium deposits that mantle the interfluvial divides between the river systems of the area (Bagot and Hughes 1979). Quaternary alluvium was deposited where the topography was essentially flat but slopes gently both toward and down the stream, or in channels where the topography is rolling. The Quaternary alluvium deposits have been found to be a primary groundwater resource in areas of the Rolling Plains. The water comes from precipitation on the surface, and, in the flood plains of streams, from stream flow. Natural discharge ordinarily occurs along streams through springs and seeps.

SOILS

Data for the soils in the area of the Kent Creek site were obtained from the soil survey of Hall County (Blakley 1967). The soils in the immediate vicinity of the site can be divided into upland and lowland soils.

The upland areas are dominated by Mansker fine sandy loam. This soil covers the ridge toe on which the Kent Creek site is located. The Mansker soil is a moderately deep, calcareous soil that has

formed in outwash materials. It contains a large amount of calcium carbonate (free lime). The surface layer is a brown to light brown fine sandy loam about 10 cm thick. The subsoil ranges from fine sandy loam to sandy clay loam in texture. The depth to the substratum is 30 to 40 cm. The natural fertility of the Mansker soil is low to moderate. The soil is good for producing grass but is not well suited for crop production.

The soil on the flood plain of Kent Creek below the site is Spur loam. This bottom land soil formed in loamy alluvial sediments that were deposited by flood waters. The surface layer ranges from 15 to 50 cm in thickness. The texture of the subsurface layer ranges from silt loam to silty clay loam. The Spur soils have a high capacity to hold water and high natural fertility. They are very productive because they receive extra water as runoff from higher lying soils.

Though it is not known if horticulture was practiced by the prehistoric inhabitants of the Kent Creek site, the lowland soils around the site probably would have been more than adequate for horticultural pursuits. These soils also would have supported a diversity of edible wild plants that were a dependable base for a variety of animals. The upland soils would have provided the necessary base for prairie plants and animals that were hunted and/or gathered by residents at the Kent Creek site.

CLIMATE

The climate of Hall County is of the semiarid, continental type (Blakley 1967). It is characterized by long, hot summers and short,

mild winters. During the spring and early summer months, southwesterly winds bring up warm, moist air from the Gulf of Mexico which collides with colder, drier air from the north. These conditions are favorable for thunderstorm activity with many of these storms being of severe nature. These thunderstorms often consist of high winds, hail, and heavy rainfall. Summer months are hot, dry, and windy. During the fall, conditions become cooler with rainfall occurring during the months of September and October. The average annual precipitation for the area is 51.25 cm (20.5 in). The average number of frost free days for the region is 213.

BIOTA

Blair (1950) places the Texas panhandle in his Kansan biotic province, with Hall County on the western edge of the Mixed-Grass Plains district. As might be expected, grasses are the principal plants of this district. Where moisture permits, usually on low-lying alluvial terraces and adjacent to streams, the grass is continuous and forms a tough sod. Here, also, grow the largest shrubs and trees. The Mixed-Grass district is dominated by blue and hairy grama grasses, with buffalo grass and various beard grasses of secondary importance.

The canyons and river valleys of the region are dominated by the presence of woody species. Prominent among these is the mesquite and Pinchot's juniper. Where moisture conditions are right, other species are also to be found, including cottonwood, hackberry, mesquite, elm, wild china, willow, and plum. Scrub oak, grape, and stretchberry are found along the base of the Llano Estacado escarpment (Tharp 1952).

Trees were numerous enough in the not too distant past that many of the early explorers described portions of this region as "forested" or "densely wooded" (Weniger 1984:39); terms which today could not be used to describe the Panhandle Plains.

Plants, undoubtedly, were much exploited by the area's aboriginal inhabitants. Wedel (1961:36-40, 294-297), discussing the most important native food plants for the Great Plains as a whole, lists several that grow on the Southern Plains, including Indian turnip, arrowhead, ground bean, sunflower, hackberry, buffalo berry, choke cherry, wild plum, onion, water chinquapin, and Indian potato. To this list Hughes and Willey (1978) add mesquite, prickly pear, and yucca. I will add the acorns from the shin oak.

The fauna of the region includes a wide variety of species. As typical of the region, Blair (1950:111) included striped skunk, badger, coyote, black-tailed prairie dog, hispid pocket mouse, Merriam pocket mouse, white-footed mouse, wood rat, fox squirrel, and bison. Other species include rabbits, deer, pronghorn antelope, bobcat, black bear, mountain lion, kit fox, raccoon, opossum, wild turkey, blue and bobwhite quail, and numerous waterfowl. Blair (1950:111-112) also states that the Kansan fauna includes only one species of land turtle, 14 species of lizards, and 31 species of snakes.

Land management practices in the area have resulted in much environmental change over the last century. The modern environment, therefore, is a poor indication of the conditions that existed when the prehistoric inhabitants occupied the area.

Exploitation of fauna for various purposes led to extinction in the region of the bison, antelope, timber wolf, black bear, mountain lion, and deer by 1930. Deer were restocked in the area in the early 1940s but the other animals have not been replaced.

With increasing groundwater irrigation on the High Plains and bordering lands, the water table has dropped and spring flow has decreased. Many springs have dried up and available surface water in the area has been drastically reduced.

CHAPTER III

PREHISTORIC BACKGROUND

The early Ceramic Period on the Texas High Plains is defined as starting at ca. A D. 200 with the appearance of barbed arrowpoints and Woodland cordmarked and/or Mogollon Brownware pottery (Hughes n.d.; Holliday 1987) The terminal date of ca. A.D. 1100 splits the difference between ca. A.D. 1000, when a Woodland/Village transition was taking place in the northern part of the Panhandle Plains, and ca. A.D. 1200, when a pit to surface house transition was taking place on the southwestern part of the Southern Plains (Hughes n.d.).

The early Ceramic Period on the Southern Plains apparently was a time when some of the Late Archaic foraging groups of the region, mainly under influences from the Mogollon tradition to the southwest and the Woodland tradition to the northeast, began to add a number of potentially revolutionary new ideas to their cultural inventory. These included the bow and arrow, pottery, houses, and doubtless some horticulture.

In order to place the Kent Creek site into context, this chapter

summarizes the prehistoric cultural backgrounds of the Plains Woodland and early Plains Village cultures, the Mogollon culture, and the Palo Duro culture. This review will help to understand the ecological and social relationships necessary for examining exchange and influence during the Ceramic Period in the Southern Plains. A chart showing the cultural chronology for the early Ceramic Period of the various regions under consideration is presented as Figure 4. Figure 5 shows the locations of sites and cultural regions discussed.

PLAINS WOODLAND AND EARLY PLAINS VILLAGE CULTURES

Eastern influences upon the Plains began during the Archaic stage, and by about the time of Christ, the Eastern Woodland agriculturalists had diffused onto the Plains (Jennings 1974). The Woodland period on the Great Plains has been designated as the Plains Woodland (Wedel 1961).

According to Jennings (1974:267), the Plains Woodland cultures varied in detail over the vast area of the Great Plains, but in architecture and ceramics they show an Eastern Woodland origin. All across the Plains, the early Plains Woodland period is characterized by cordmarked, conical-based ceramics. Houses are not well known. The earliest houses appear to have been shallow basins, some up to 5.5 m in diameter, which contain fireplaces. These houses apparently were made of light poles covered with grass or thatch, presumably of an Eastern Woodlands type (Wedel 1961). Later houses are larger and more substantially built.

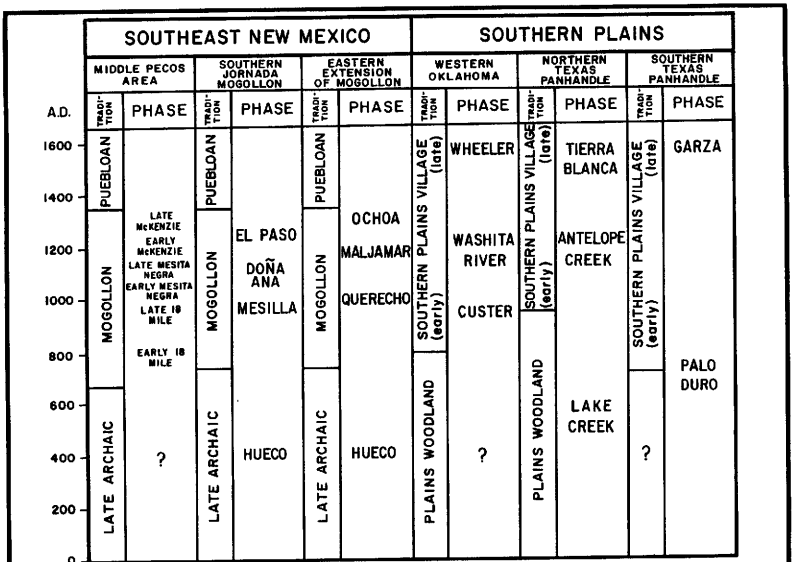

Figure 4. Cultural chronology chart of the Southern Plains and eastern New Mexico.

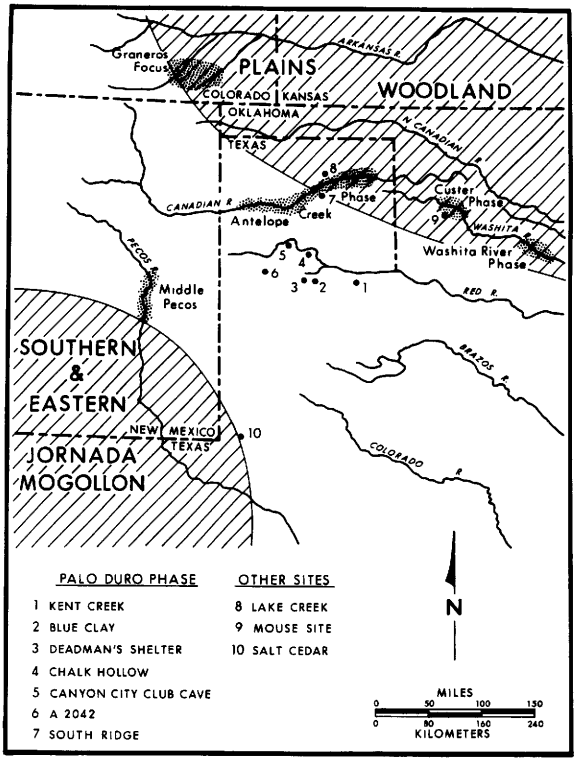

Figure 5. Map of the Llano Estacado and surrounding areas showing the locations of archaeological sites and culture areas mentioned in the text.

Horticulture, though practiced, was not as important in the overall subsistence economy as in the later Plains Village complexes. Artifacts of stone and bone were principally those required in hunting and gathering, and in processing the results of such activities. Stemmed and corner-notched dart and arrowpoints, scrapers (both side and end), ovate knives, and choppers are present. Grinding slabs and one-hand manos suggests the crushing of vegetal foods. From a site in Valley County, Nebraska (Wedel 1961:91), came part of a bison leg bone pierced at the end for insertion of a handle, perhaps the earliest instance of the bone-digging stick tips that became much more plentiful in later times among the Plains Village groups. Such typical later Plains artifacts as the bison shoulder-blade hoe, the diamond-shaped bevel-edged knife, the bone fishhook, and sandstone arrow shaft smoothers used in pairs, are absent.

In the Texas portion of the Southern Plains, the Woodland period is represented by the Lake Creek complex (Hughes 1962). This complex was first defined by Hughes on the basis of test excavations at a site on Lake Creek, a north-side tributary to the Canadian River in Hutchinson County. The complex is characterized primarily by a combination of Woodland cordmarked pottery with Scallorn-like arrowpoints. Sites of the complex are typically small, frequently buried open camps. They tend to be located on lesser tributaries rather than along primary waterways (Couzzourt 1982).

In addition to the cordmarked ceramics and Scallorn-like arrowpoints, tool assemblages consists of subtriangular preforms;

limited numbers of corner-notched, expanding-stem dartpoints; ovate, triangular, or flake knives; end, side, and flake scrapers; large numbers of utilized and retouched flakes; high concentrations of cobble one-hand manos and basin type slab metates; and heavy reliance on locally available lithic materials. Features at the sites include storage pits and rock-lined hearths. Bison bone tends to be scarce, with most faunal remains indicating principal use of deer, antelope, and smaller mammals (Couzzourt 1982; Hughes n.d.).

As yet, no definite evidence of horticulture has been found at any Panhandle Woodland site, although horticulture seems to have been practiced throughout the Woodland period in other regions. There are no radiocarbon dates from Woodland sites in the Panhandle, but dates from several sites in western Oklahoma and southeastern Colorado indicate a span of ca. A.D. 200 to 900 (Hughes n.d.).

No house structures have been reported for the Plains Woodland in either Texas or Oklahoma. In southeastern Colorado, houses have been found associated with the Graneros focus. These houses are circular with horizontally placed slab-rock foundations (Campbell 1969). The association of masonry houses in an otherwise typical Plains Woodland context suggests some influences were derived from the Anasazi in northern New Mexico (Lintz 1976). Radiocarbon dates for the Graneros focus range from ca. A.D. 450 to 750.

It is apparent that the Plains Woodland stage is not well understood in the Southern Plains. In many areas the subsistence pattern was not drastically altered from the earlier Archaic period.

Semi-nomadic groups were apparently exploiting specific regional microenvironments. The concept of crop cultivation may have spread across the Southern Plains along with the introduction of pottery and the bow and arrow. The absence of horticultural tools and direct evidence of domesticated plants from Plains Woodland sites in Texas and Oklahoma indicate that the route as well as the rate of spread has not been well established.

Whatever the source, by ca. A.D. 700 or 800 larger sites with evidence of structures and horticulture appear in the region. These sites are attributed to what has been called the Early Plains Village period (Baugh *et al.* 1984; Hofman 1984). This period is divided spatially and temporally into several phases. The earliest of these phases is the Custer phase (Hofman 1978, 1984) located in western Oklahoma. According to Hofman (1984:287), the Custer phase (A.D. 800-1100) is interpreted as an early Plains Village complex that developed out of southern Plains Woodland manifestations.

The Custer phase economy was based primarily on hunting and foraging and a limited amount of horticulture. The predominant artifacts from most Custer phase sites are pottery sherds (Hofman 1984). Both cordmarked and smooth surfaced ceramics are found. The pottery was a course utilitarian ware typified by globular cooking and storage vessels. Other traits (Hofman 1984:296-298) include a variety of stone artifacts. Corner-notched arrowpoints in the range of the Scallorn type are found as are triangular side-notched and unnotched types such as Washita and Fresno. Scrapers include the typical Plains style end scraper, side scrapers, flake scrapers, spokeshaves, and

pointed scrapers or reamers. Ovate knives, flake knives, and beveled-edge knives are found, but the diamond-beveled or Harahay knife is not common. Both expanding-base and plain-shafted drills occur, as do large dart points. The most common chipped stone tools are flake knives or scrapers that show minimal modification.

Ground stone artifacts include unifacial and bifacial manos, grinding basins, abraders, and arrow-shaft smoothers. Bone artifacts are generally found in small numbers. Bison-tibia digging stick tips are found, but are rare. Bone awls are also occasionally found. Shell artifacts include scrapers and disc-shaped beads made from freshwater mussels.

The Custer phase has provided the earliest architectural remains for western Oklahoma (Hofman 1984; Drass and Moore 1987). To date, only one house pattern has been uncovered. This house was found at the Mouse site (34CU25) located in Custer County, Oklahoma. In outline the house is rectangular with rounded corners and lacks visible evidence of an entryway. This house appears to have been of wattle-and-daub construction with posts for wall supports. A rock-lined hearth was present near the center of the structure. The roof covering of the house was presumably of thatch or bundles of grass placed in a shinglelike fashion on a light roof frame (Hofman 1984). In size, the structure had a floor area of ca. 26.5 square meters.

Slightly later in time than the Custer phase are the Antelope Creek phase (A.D.1200-1500) located principally along the Canadian River in the Texas panhandle, and the Washita River phase (A.D. 1250-

1450) located in western and central Oklahoma. The Antelope Creek phase is marked by rectangular houses, often contiguous, with slab-rock foundations. Other characteristics include Borger Cordmarked ceramics and Washita and Fresno arrowpoints. The economy of the Antelope Creek phase was based on bison hunting and horticulture.

According to Lintz (1982), Antelope Creek structures display a wide range of variation in room size, shape, construction methods, and interior feature composition. Nevertheless, the most common structural type is a large rectangular structure with a low extended entryway to the east, a step feature, a shallow depressed floor channel which encompasses nearly one-third of the floor area, a centrally located hearth, two to six roof support posts along the channel margins, and a raised platform or altar either recessed into the west wall or protruding into the channel from the west wall. The floor area for this type of structure ranges from 9.3 to 60.4 square meters (Lintz 1982:39). The structures are often built in shallow pits. The walls are frequently made with adobe mortar reinforced with stone slabs or, more rarely, posts. Typically, the basal foundation consists of a single or double row of unshaped stone slabs set vertically within a wall trench.

Though roughly contemporary, the Washita River phase differs from the Antelope Creek phase in that its ceramic assemblage is dominated by plain wares and houses are not slab-lined. Generally, Washita River phase houses are rectangular; house floors range from surface level to somewhat subterranean. Roofs were typically thatched with

cane or willow (Brooks 1987) and were supported with two to four central posts. Numerous auxiliary posts suggest support for platforms and benches. Like the Antelope Creek phase, Washita and Fresno arrowpoints are abundant and subsistence pursuits revolved around bison procurement and horticulture.

MOGOLLON

Traditionally, the Mogollon has been considered one of the three basic cultural divisions in the Southwest, the other two being the Anasazi and the Hohokam. The Mogollon culture area is usually divided into several regional branches, each of which are divided into a series of local phase chronologies (Haury 1936; Anyon *et al.* 1981; Cordell 1984). Geographically, the Mogollon cultural region extends from present-day southcentral and southeastern Arizona, eastward across southern New Mexico and northern Chihuahua, Mexico, into Texas to the Pecos River (Anyon and LeBlanc 1984).

Broadly synchronous changes among the various Mogollon branches and phases are recognizable (Wheat 1955; McGregor 1965). For example, sedentary, horticultural villages begin to be established throughout the region during the various early Mogollon phases (ca. A.D. 200-600). The pithouses of the early phases were round or D-shaped, semisubterranean structures. The roof was supported by posts and usually consisted of small pieces of wood or thatch which were capped with mud. Entrances were small steps or side vestibules, or they consisted of covered, sloping ramps which led from the edge of the

floor to the outside surface of the ground (McGregor 1965). Most structures contained firepits; and storage pits were also common. Burials of the period were generally loosely flexed and buried in trash mounds, in storage pits, or in the open.

Pottery of the early Mogollon phases consisted of plain, brown wares that were made by coiling and then were smoothed to final shape by scraping. Jars predominated over other shapes, but most were relatively small. According to Anyon and LeBlanc (1984:22), the jar shapes are reminiscent of gourds, a characteristic which disappeared during the later periods.

Other material remains include basin, slab, and scoop metates with manos which are mostly one-hand, either round or oval in plan. Projectile points are rather slender with lateral notches and expanding stems, or are diagonally notched. Atlatls and darts, and bows and arrows, are both indicated. Flake knives and flanged drills occur as do blade scrapers and choppers.

During the later Mogollon phases (ca. A.D. 600-1000), larger settlements with more complex social organization develop across the region. During this time kivas or other communal structures appeared in villages. Some ceramics were now painted and there is an increase of exotic or trade goods (Anyon 1980). Burial practices evolved from locations in trash-filled pithouses to a few sub-floor interments (Anyon *et al.* 1981).

During this period, pithouses evolved from circular structures to rectangular structures with rounded corners and eventually to squared corners. Entrances of the structures were usually long, sloping

ramps. Anyon (1980) found that pithouses at this time generally have rampways oriented to the east or southeast, though rampways oriented in all directions have been found. Pithouses during this time period vary considerably in size, however they generally average about 13.5-15.5 square meters (Wheat 1955; Anyon and LeBlanc 1984).

Posthole patterns have also been found to be highly variable during all phases of the Mogollon cultural sequence. However, most structures do contain a large central post with auxillary posts occurring either in the corners, along the long axis of the pithouse, or along the central axis (Wheat 1955; Bullard 1962; Anyon and LeBlanc 1984). Haury (1936) noted that wall construction in early pithouses of this period was made exclusively of adobe puddled directly onto the edges of the pit. In later pithouses, there was occasional use of unworked river cobble masonry along walls or portions of walls which needed extra support.

Except for a few instances, hearths are generally located between the point where the rampway joined the pithouse and the center of the pithouse. Hearths range from shallow ash lenses in the earlier structures to rectangular adobe or slab-lined features in the later structures.

The plain brown wares of the earlier phases gave way to painted red-on-brown wares during the later phases. Later, red-on-white, black-on-white, and figurative designs in bowls were added.

Other than ceramics, material remains consisted of small projectile points with shallow lateral or diagonal notches; mortars

and pestles, hoes; and drills. Flake knives decreased in abundance, but scrapers and choppers were still common (McGregor 1965). The atlatl was apparently still in use, but rare. Grinding implements consisted of slab, basin, trough, and through-trough metates and both one-hand and two-hand manos.

After about A.D. 1000, there is an apparent increase in site density in most areas accompanied by a shift to the construction of aboveground contiguous-room pueblos. By this time, black-on-white ceramics have become the predominant types. The surface structures varied from a few rooms to blocks with numerous rooms. Most of the room blocks have associated kivas. The types of wall construction vary from flat rocks laid up in a minimum of mortar to adobe or even wattle and daub walls (McGregor 1965).

MOGOLLON GROUPS ON THE EASTERN PERIPHERY

On the eastern periphery of the Southwest, several Mogollon groups or cultural areas have been recognized. These include the Southern Jornada Mogollon (Lehmer 1948), the eastern extension of the Jornada Mogollon as proposed by Corley (1965), and the region of the Middle Pecos River Valley (Jelinek 1967). A synopsis of the prehistory of these groups is provided below since they would have had the greatest opportunities for contact and interaction with the cultures of the Southern Plains.

Southern Jornada Mogollon

The Jornada Mogollon has been recognized as the easternmost occurrence of the Mogollon culture (Lehmer 1948). The Jornada

Mogollon was divided by Lehmer into northern and southern variants. Pertinent to this discussion is the Southern Jornada Mogollon. The Southern Jornada Mogollon occupied the area that extends between the Rio Grande and Pecos rivers from the northern end of the Caballo Mountains south to the junction of the Rio Grande and Conchos rivers.

Lehmer (1948) subdivided the Southern Jornada Mogollon into the Mesilla, Dona Ana, and El Paso phases (see Figure 4). The earliest evidence of pithouses in the Southern Jornada Mogollon region occurs during the Mesilla phase. Lehmer (1948) begins this phase at A.D. 900, but to the east in the Hueco Bolson, Whalen (1977) begins this phase (his Period 1) around A.D. 500.

Small to medium sized agricultural villages ($\pm$ 15 structures) occur throughout the region during this period (Marshall 1973). The Mesilla phase structures were subterranean and were circular or rectangular. Some circular pithouses were entered through the roofs, while the rectangular variety had an inclined entrance ramp. According to Wheat (1955:52), Jornada houses at this time average 15 m in floor area and 95 cm deep.

Little detailed regional information on subsistence, settlement, and social systems is available for the Mesilla phase (Whalen 1977). The settlements seem to be agricultural, but perhaps less so than in the succeeding periods. By all indications, the region was not particularly densely occupied at this time. Cordell (1984:301) suggests that the populations of the region seem to have remained relatively more mobile throughout the period than those of surrounding regions. Further, she states that it is likely that villages were

small and perhaps somewhat temporary (Cordell 1984:301). They may have housed only a few related families and been sustained as much by gathering and hunting as by agriculture.

The ceramics during this period were largely unpainted brown to reddish brown low-necked jars and hemispherical bowls. Very similar sorts of vessels were apparently contemporaneously made over a wide area of southern New Mexico, western Texas, and northern Mexico. As Scholes and Mera (1940) observed, there is minimal evident variety, so that analytical differentiation between these brownwares is quite difficult at times.

The Dona Ana phase dates from approximately A.D. 1100 to 1200. This phase was originally defined as a short transitional period between the Mesilla phase and the later El Paso phase (Lehmer 1948). Several substantive alterations were made during this time, including a change from pithouses to surface rooms. Also, painted vessels, such as El Paso Polychrome, began to replace the unpainted brownwares. Social and economic ties with the Mimbres Valley are represented by the occurrence of Mimbres Boldface and Classic Mimbres Black-on-White ceramics.

The El Paso phase in the region (ca. A.D. 1200-1400) saw the demise of pithouse architecture, development of contiguous blocks of east-west aligned surface rooms, more elaborate food storage facilities, ceremonial structures, and other indications of increasing social complexity (Whalen 1977).

As with the earlier phases, ceramics of this period are distributed over a wide area of central New Mexico, western Texas, and

northern Mexico. Of interest is the distribution of wares to the east. Mera (1938) reports finding El Paso Polychrome in camp sites as far east as the Pecos River and Sayles (1935) reports finding El Paso phase wares east of the Pecos as well.

Eastern Extension of the Jornada Mogollon

Corley (1965), based on test excavations at several sites on the Southern Plains in southeastern New Mexico, proposed an eastern extension of the Jornada branch of the Mogollon (Figure 5) with a sequence of Querecho, Maljamar, and Ochoa phases (Figure 4). Since 1965, components of the Eastern Jornada phases have been reported in excavations at several other sites, not only in southeastern New Mexico but also at the Salt Cedar site in Texas (Collins 1966, 1968), and are recognizable in excavation and survey reports at many other sites in the Texas part of the Southern Plains (Hughes n.d.).

According to Corley (1965) and Collins (1971), the Querecho phase is dated at A.D. 950 to 1100 and is characterized by sites without houses; corner-notched arrowpoints; a few small dartpoints; a locally made plain brownware; and several kinds of intrusive wares including El Paso Brown, Jornada Brown, Jornada Red-on-Brown, Three Rivers Red-on-Terracotta Boldline, and Chupadero Black-on-White.

The Maljamar phase is dated at A.D. 1100 to 1300 and is characterized by pithouses, locally made plain and corrugated brownwares, corner-notched arrowpoints until ca. A.D. 1200, and side-notched triangular arrowpoints thereafter. Intrusive ceramics include El Paso Brown, El Paso Polychrome, Mimbres Black-on-White, Playas Red-

Incised, Three Rivers Red-on-Terracota Boldline, Three Rivers Red-on-Terracota Fine line, and Chupadero Black-on-White.

The Ochoa phase is dated at A.D. 1300 to 1450 and includes El Paso Polychrome, Three Rivers Red-on-Terracotta Fine line, Gila Polychrome, Ramos Polychrome, Pecos Glaze I Red, Pecos Glaze I Yellow, and Lincoln Black-on-Red ceramics. In addition, Ochoa phase sites are characterized by jacal-like surface houses with rock and adobe foundations, locally made Ochoa Indented Brownware, and side-notched triangular arrowpoints. As Hughes (n.d.) has pointed out, it should be noted that all of the dates for the Eastern Jornada sequence are estimates based on ages of various intrusive types of earlier Mogollon and later Anasazi pottery.

No evidence of horticulture has been found at Eastern Jornada sites and it has been suggested (Collins 1971) that these sites represent people who had managed to turn a Late Archaic foraging existence, under influences from Jornada Mogollon cultures to the west, into a semi-sedentary lifestyle with villages and pottery. These villages were centered on the spring-fed draws and playas of the southwestern Llano Estacado and subsistence was based mainly on hunting buffalo and gathering acorns. Collins (1971) noted, however, that in the Eastern Jornada sequence bison were scarce during the earlier phases, until ca. A.D. 1200. This accords well with evidence from the Panhandle Plains, and from the Southern Plains in general (Dillehay 1974).

Middle Pecos Region

As a result of survey data and limited test excavations in this region, Jelinek (1967) has proposed a series of phases which are based primarily on ceramic types. These "ceramic" phases correspond to his earlier defined "cultural" phases (Jelinek 1960), with the additional modification of a separation of an early and late manifestation of each. This results in six phases (see Figure 4): Early 18 Mile, Late 18 Mile, Early Mesita Negra, Late Mesita Negra, Early McKenzie, and Late McKenzie.

The Early 18 Mile phase dates from ca. A.D. 800 to 900. According to Jelinek (1967:144), "this is the first cultural phase [in the region] in which artifact materials and site locations suggest relatively permanent settlements in topographic situations suitable for the practice of maize cultivation." Sites of this phase are small and few in number and contain relatively small numbers of ceramics. Jornada Brown is the dominant ceramic type and Middle Pecos Micaceous Brown is of secondary importance. South Pecos Brown and Alma Brown are both present in small quantitites and are probably intrusives. Projectile points are laterally notched forms with convex edges. House types are not known.

The Late 18 Mile phase (A.D. 900-1000) represents the first time in which well-established small sedentary villages make their appearance in the valley. The phase is distinguished mainly on the basis of the ceramic assemblage which includes Middle Pecos Micaceous Brown as the dominant ware, replacing Jornada Brown. South Pecos Brown continues to be well represented as a minority type. Intrusive

wares include Red Mesa Black-on-White. Projectile points of the phase are mostly diagonally notched with convex bases and convex to straight blade edges. They are of moderate size and are almost all apparently arrowpoints. House types are slab-lined pithouses and small contiguous roomed rectangular structures, slightly excavated into the ground and incorporating small vertical sandstone slabs in the wall bases.

The Early Mesita Negra phase dates from ca. A.D. 1000 to 1100 and is marked by relatively abundant large-size sites. The brownware ceramic tradition in this phase shows a marked dominance of Middle Pecos Micaceous Brown, with Jornada and South Pecos Brown continuing in diminished quantity. Roswell Brown is also found in small amounts. Intrusive ceramic types include Red Mesa, Cebolleta, Socorro, Mimbres, and Reserve Black-on-White, and Broadline Red-on-Terra Cotta. Also, a few sherds of Chupadero Black-on-White appear as intrusives. Projectile points of this phase are generally similar to those of the preceding Late 18 Mile phase. They are of moderate size and shape, diagonally notched, with convex base and straight to convex blade edges. The only structure which can be assigned to this phase consists of a shallow floor outlined by a semi-circular arrangement of sandstone slabs, with a central hearth and possible internal partitions of adobe.

The Late Mesita Negra phase dates from A.D. 1100 to 1200 and is marked by a decline in Middle Pecos Micaceous Brown and an increase in native graywares. According to Jelinek (1967:149) the few sherds of McKenzie Brown found during this phase mark the beginning of an almost

complete replacement of Micaceous Brown by this new type in succeeding phases. Intrusive wares include Santa Fe Black-on-White, Cebolleta and Socorro Black-on-White, and Broadline Red-on-Terra Cotta. Chupadero Black-on-White in significant quantities is also found during this phase. Projectile points with straight and convex blade edges occur in equal amounts and the formerly predominant convex bases are now roughly equal in number to straight bases. Most points are diagonally notched. Architectural remains associated with this phase is limited to a single poorly-defined subsurface structure.

The Early McKenzie phase is of short duration (A.D. 1200-1250). The ceramic assemblage is similar to that of the Late Mesita Negra phase except for higher percentages of McKenzie Brown and Middle Pecos Black-on-White in this phase. The use of Roswell Brown continues and Chupadero Black-on-White also continues to be used. Evidence of intrusive wares is scarce and consist of Santa Fe Black-on-White. Projectile points of this phase are characterized by the first appearance of triangular points with straight bases, convex blade edges, and side notches. Architecture in this phase includes rectangular, slab-based surface rooms.

During the Late McKenzie phase (A.D. 1250-1350) brown utility wares become a minor element in the ceramic assemblage, being replaced by Middle Pecos Black-on-White. Chupadero Black-on-White increases in frequency and corrugated brownwares appear in significant quantities. The projectile points of the phase are triangular side notched forms. According to Jelinek (1967), the number of points relative to sherds is greater for this phase than for any preceding phase. In addition,

small, thick, steep-edged end scrapers are found at all sites of this phase. The architectural remains of this phase are contiguous-room rectangular surface structures with support posts for the roof.

Jelinek (1967) notes that there is a marked rise in grass pollen in this phase and a corresponding drop in cheno-am and *Zea* pollen. Also, there is a marked increase in the utilization of bison. These factors apparently represent a major change in subsistence strategies during this phase. As noted earlier, this change in subsistence has been observed for the Eastern Jornada Mogollon as well.

PALO DURO PHASE

As pointed out in Chapter I, the Palo Duro phase was initially recognized and described by Hughes and Willey (1978) as a cultural complex. A number of sites in the region with similar remains have now been investigated. The similarity of the cultural material recovered from these sites suggests that these remains represent "the residue of a discrete and linked series of local communities" (Johnson 1986:3) which more properly should be classified as a phase (Willey and Phillips 1958; Johnson 1986). Beginning with the excavations at the Deadman's Shelter site, these sites and their artifactual assemblages will be briefly examined. The Palo Duro phase will then be defined.

The Deadman's Shelter site is located in Tule Canyon about 122 m (400 ft) downstream from the juncture of Deadman's and Barber's creeks, now in Mackenzie Reservoir (Hughes and Willey 1978). Excavation of all but the back part of the shelter revealed two

principal occupations separated in most places by sterile soil or sandstone rockfall from the roof of the shelter.

The lower or earlier occupation consisted of several features and numerous artifactual specimens including a quantity of distinctive basally-notched arrowpoints for which Hughes and Willey (1978) proposed the name "Deadman point." Other specimens included Scallorn arrowpoints, seven untyped dart points, cores, ovate knives, end and side scrapers, drills, gravers, denticulates, spokeshaves, choppers, metates, manos, bone awls, a shell pendant, one obsidian flake, and 12 brownware ceramics identified as Jornada Brownware. Features discovered include two rock-lined hearths, one unlined hearth, and a human burial. The burial, that of an adult male, was a primary interment in an extended position. The burial goods included the shell of a yellow mud turtle; three split deer metapodials, probably awl blanks; a finished awl; a deer ulna; and two mussel shells. Three radiocarbon dates from this stratum were A.D. 120±60, A.D. 210±40, and A.D. 1320±140. Hughes and Willey (1978) viewed the last date as inaccurate.

The upper or more recent occupation also contained Deadman and Scallorn arrowpoints, knives, scrapers, denticulates, spokeshaves, choppers, a core, metates, manos, one obsidian flake, one incised mussel shell, bone awls, and two Jornada Brownware sherds. The features included two unlined hearths. The two radiocarbon dates from this occupation were A.D. 465±70 and A.D. 710±65.

Many animal bones were also recovered from both occupations at the shelter. The most numerous animals encountered were deer,

followed by rodents, and rabbits. Among the rodent bones were those of the *Microtus ochrogaster*, commonly known as the prairie vole. The presence of the prairie vole is noteworthy because the creature no longer inhabits the Texas panhandle, preferring the cooler and more moist areas farther north and east in Oklahoma, Kansas, and eastern Texas. This suggests that the climate locally may have been wetter during this time period than it is now. Almost completely lacking from the faunal sample were bison remains. Only one individual was identified by a second phalanx and a molar fragment (Hughes and Willey 1978).

Other components of the Palo Duro phase which have been tested and reported are the Canyon City Club Cave site (Hughes 1969), the Chalk Hollow site (Wedel 1975), the Blue Clay site (Hughes and Willey 1978), the South Ridge site (Etchieson 1979), and site A2042 (Hays 1986). Also, recent surveys in the area have located a number of other Palo Duro sites which have not been tested (Hughes *et al.* 1977; Etchieson *et al.* 1977; Hughes 1979a; Bagot and Hughes 1979).

The Canyon City Club Cave site (Hughes 1969) is located along Palo Duro Creek in Randall County, Texas. This site contained five distinct cultural levels. Level 4 yielded artifacts diagnostic of the Palo Duro phase. These included Deadman's and Scallorn-like arrowpoints; arrowpoint preforms; untyped corner-notched dart points; ovate knives; end, side, and flake scrapers; metate fragments; and one obsidian flake. Bone tools included awls, flakers, and beads. Mogollon ceramics were not recovered from this level but one brownware sherd was recovered from the talus slope outside the cave entrance.

Features from this level included a thin layer of charcoal under a large sandstone slab and a concentration of burned rock, charcoal, and charred grass in an irregular basin. Two radiocarbon dates for this level were A.D. 300±55 and A.D. 680±60.

A large number of faunal remains were recovered from Level 4 at the site. Principal species include cottontail rabbit, prairie dog, pocket gopher, cotton rat, wood rat, prairie vole, striped skunk, deer, antelope, and bison.

The Chalk Hollow site (Wedel 1975) is located on a short tributary of Palo Duro Canyon. The site contained two vertically separated middens. Based on the artifacts recovered, the lower midden can be assigned to a Late Archaic occupation and the upper midden to the Palo Duro phase. Materials from the upper midden included "small stemmed or corner-notched projectile points...generally in the Scallorn, or Scallorn-like category" (Wedel 1975:272), end and side scrapers, knives, metates, manos, bone awls, obsidian flakes, and "occasional potsherds of plain brown ware." Wedel (1975:272) states that features consisted of "unformalized hearths" and that animal bone was present "in highly variable amounts." Six radiocarbon dates for this midden range from A.D. 400 to A.D. 850.

The Blue Clay site was excavated by Hughes and Willey (1978) as part of the Mackenzie Reservoir project. The site is located on a terrace above Tule Creek. Artifacts from the site consisted of Deadman and Scallorn arrowpoints, three untyped dart points, cores, oval knives, scrapers, drills, gravers, spokeshaves, choppers, metates (but no manos), gouges, 47 Jornada Brownware sherds, and numerous

small bone and mussel shell fragments. Features consisted of two rock-lined hearths and one unlined hearth. No radiocarbon dates were obtained from the site.

The South Ridge site, excavated and reported by Etchieson (1979), is located near the Canadian River on the western rim of South Canyon within the Lake Meredith Recreation area. Two horizontally separate occupations were recognized at the site. On the western end of the site was an Antelope Creek phase occupation and on the eastern end was a Palo Duro phase occupation. Materials recovered from the east end of the site include Deadman (but not Scallorn) arrowpoints, arrowpoint preforms, cores, retouched flakes, gravers, spokeshaves, end and flake scrapers, choppers, oval knives, two untyped dart points, metates, manos, and 18 brownware sherds which "fit the description of Jornada Brown" (Etchieson 1979:93). No features were located and no radiocarbon dates were obtained from the site.

Finally, Hays (1986) reports that site A2042, located within the Buffalo Lake National Wildlife Refuge in Randall County, Texas, appears to be a site of the Palo Duro phase which may contain structures. A single test pit at this site produced a sherd of Mogollon Brownware, a piece of daub, and numerous lithic and bone items. Hays (1986:10) suspects that shallow depressions at the site to be buried pithouses, though this remains to be determined.

Based on the investigations at the sites mentioned above, the Palo Duro phase, then, can be characterized as follows. The artifactual assemblage is primarily marked by the presence of Deadman and Scallorn arrowpoints and Mogollon Brownware ceramics. Also, dart

points (corner notched with expanding stems) are not uncommon. Other assemblage characteristics include fairly high concentrations of thin-slab metates and cobble manos. Knives tend to be ovate shaped and scrapers are varied in form with small flake or side scrapers usually dominating. Other lithic tools include cores, gravers, denticulates, spokeshaves, choppers, drills, and hammerstones. The bone tool inventory is composed of small nonagricultural tools, namely awls and awl blanks. Shell tools consist of pendants and scrapers. The lithic raw materials are predominately local but a few flakes of obsidian are also usually present. Features consist of rock-lined or unlined hearths.

Direct evidence of horticulture has not been reported at any Palo Duro site and faunal assemblages are usually dominated by deer and small mammal remains with bison remains occurring only rarely. In general, sites of the Palo Duro phase are small open camps or rockshelters located along the eastern margins of the Texas panhandle. The economy of the Palo Duro phase was apparently based primarily on hunting and gathering. The phase spans the time period from approximately A.D. 200 to A.D. 1000.

CHAPTER IV

EXCAVATION METHODS AND RESEARCH DESIGN

This chapter presents the excavation methods utilized during the two seasons of fieldwork at the Kent Creek site. Following this discussion, the research design and research questions for this study are presented.

EXCAVATION METHODS

As mentioned in Chapter I, the Kent Creek site is located on a ridge toe which has been bisected by an abandoned county road that runs east-west across the site. The road cut is approximately 8 m wide and 1.5 to 2 m deep. South of the road cut is a cultivated field which has impacted the site in that direction. To the north, however, the site has not been disturbed and the excavations were conducted here, where the cultural deposits appeared to be intact (Figure 2). Field work at the site was conducted during the summers of 1985 and 1986 and was accomplished primarily with the help of members from the Panhandle Archaeological Society.

Since no archaeological features were visible prior to excavation, an arbitrary point was selected south of the road cut for the grid datum (NOEO stake). This datum was assigned an arbitrary elevation of 100 m. In establishing the grid, primary north-south and east-west axes were staked out, along with squares for excavation. The excavation squares were primarily one-by-one meter units though one-by-two meter and two-by-two meter units were also used. All horizontal locations were recorded in a coordinate system by cardinal direction and distance in meters and centimeters from the grid datum.

In August of 1985 a one-by-two meter test unit was established from the grid datum on the north edge of the road cut and was designated as N16-17 W2-4. A small rock-lined hearth (Feature 1) was encountered at 35 cm below ground surface (bgs) and produced two Ellis-like dart point bases and a small brownware sherd. From this initial test unit an excavation block consisting of 14 one-by-one meter units was expanded to the north and west. The excavations during the 1985 season produced several diagnostics of the Palo Duro phase including Deadman and Scallorn arrowpoints and several brownware sherds. However, as no other features were encountered and data recovery was minimal, a larger sample was desirable.

Thus, during the summer of 1986 excavations were continued with an additional 20 one-by-one meter, three two-by-two meter, and seven one-by-two meter units excavated. An additional 12 features were defined, including two fully exposed structures. Other features included hearths, pits, a mano cache, and a burial.

In total, 62 square meters were excavated at the site. All the units were excavated in 10 cm levels within natural strata and screened through 1/4 in screen. Approximately 1/4 of each feature was screened through 1/16 in screen and a sample from each feature was saved for flotation. All features were drawn in plan view, sectioned, and photographed. Soil profiles were drawn and photographed as the excavation block was expanded. Strict provenience information was kept on each artifact and feature to later be correlated with the grid maps and site plan. Level records for each level of each unit were kept and artifacts were mapped in place and recorded on the level records.

When the structures were encountered they were completely excavated and the walls and floors drawn and photographed. The floors were carefully troweled to expose any features or postmolds and then a plan view and cross section was drawn for each structure. Appropriate measurements and elevations were noted and soil and pollen samples were collected from each structure. The floors were then excavated to search for any sub-floor features.

RESEARCH DESIGN

As pointed out earlier, the Kent Creek site is the only site of the Palo Duro phase yet investigated where structures have been found. Given the limited amount of attention that sites of this phase have received from archaeologists of the region, it is anticipated that other Palo Duro sites will be found that contain structural remains.

The structural remains and storage type features at Kent Creek represent a radical change in lifestyle from that previously known for the region. The subsistence pattern of the Archaic cultural groups preceding the Palo Duro phase was essentially that of the nomadic hunter/gatherer where permanent type structures and storage facilities were not needed. It is hypothesized that the Palo Duro phase may have developed from these indigenous Archaic groups and that after this development they served as intermediaries in the dissemination of ideas as well as cultural materials between the Southwestern groups and the Plains groups.

Contact and trade between groups of the Southern Plains and the Southwest has been documented in Historic times (Hammond and Rey 1940) and is evident in the archaeological record for both the Early and Late Ceramic Periods as well. For the Late Ceramic Period, Puebloan trade wares and obsidian have been recovered from sites of the Antelope Creek phase (1200-1500 A.D.) in the Texas panhandle and from Washita River phase sites (1250-1450 A.D.) in western Oklahoma. For the Early Ceramic Period, Hughes (n.d.) and Couzzourt (1982) have pointed out that many of the Woodland period sites (marked by the presence of cordmarked ceramics) along the Canadian River contain a few sherds of Mogollon Brownwares as well. This suggests contact between the Southwest and the Plains at least as early as the first centuries A.D.

The extent of this contact or the influence that it may have had on the cultural groups of the respective regions has been demonstrated only to a limited degree. For example, it has been suggested that

the architecture of the Antelope Creek phase was probably influenced by Puebloan architecture (Krieger 1946; Lintz 1986). Also, similarities between the plainware ceramics recovered from some of the Plains Woodland components in western Oklahoma and those recovered from Deadman's Shelter have been noted (Baugh 1986). The question then is what was the relationship between the cultures of the Southern Plains (i.e., Palo Duro phase), Eastern Woodlands, and Southwest during the early centuries A.D. It is hoped that the investigations at the Kent Creek site will provide some insights into the nature of these relationships.

Stated specifically the goals of this thesis are as follows:

1) To provide an in depth description and analysis of the architectural remains and features at the site;
2) To provide a general description and analysis of the material assemblage recovered from the site; and
3) To assess the amount of influence the Mogollon or Plains Woodland groups could have had on the developing cultures of the Southern Plains during the Ceramic Period.

An attempt to answer several research questions specifically about the site will also be made. These questions are:

1) What is the age of the Kent Creek site occupation;
2) How do the structures at Kent Creek compare to structures of the Mogollon and Plains Woodland complexes;
3) Do the recovered materials indicate an occupation by an indigenous cultural group or by an emmigrant group;

4) What do the types of artifacts and the artifact distribution reveal about activities, activity areas, or room functions at the site; and

5) What were the subsistence strategies at the site? Is there evidence of horticulture? Why are bison remains so scarce?

CHAPTER V

SITE STRATIGRAPHY, STRUCTURES AND FEATURES

Excavations at the Kent Creek site resulted in the discovery of two (possibly three) structures, a burial, and several other associated features. Following a description of the stratigraphy at the site, this chapter will describe the structural remains and features.

SITE STRATIGRAPHY

The stratigraphy of the site consists of four major strata with Stratum 2 containing minor sub-strata. Stratum 1 is a yellowish brown (10YR5/4) recent cover sand which averages five to eight centimeters thick. It contained only a few small waste flakes.

Stratum 2 represents the occupational zone at the site. This stratum appears to be an accumulation of midden debris spread sheet-like across the site. It consists of a dark grayish brown (10YR3/3) sand mixed with cultural debris and natural gravels. Some 30-35 cm thick on the hilltop, Stratum 2 lenses out toward the west edge of the site where it is only about five centimeters thick. The gravels in

this stratum range from four to five millimeters in diameter up to 50-60 mm or larger.

Stratum 2 was separated into three zones (2a, 2b, and 2c) for the purposes of analysis. Stratum 2a is the uppermost 10 cm of the stratum and is a mixture of Stratum 1 with Stratum 2. Stratum 2b is the zone which contains the heaviest concentration of cultural materials and Stratum 2c is a mixed zone with Stratum 3.

Stratum 3 is a brownish yellow (10YR6/8) compact sandy clay and gravel bed which forms the low hills that border Kent Creek. The stream-rolled gravels of Stratum 3 are as much as 60 mm in diameter and are heavily coated and cemented with calcium carbonate. This stratum (exposed by the road cut) is 2-2.5 m thick and is sterile of cultural material. Along the west edge of the site the large gravels extend up almost to ground surface. These gravels provide a "face" along the west slope of the hill which is very resistant to erosion and has prevented the creek from cutting into the hill during times of flooding. Throughout these gravels are fossil *Graphia* shells indicating the gravels are from the Pliocene age Ogallala or Panhandle Formation (Gidley 1903). The gravels often contain a great variety of chippable materials, including chert, quartzite, and silicified wood (Hughes and Willey 1978).

Exposed in one or two places at the base of the Pliocene gravels is Stratum 4, a gray to brown sandstone from the Late Triassic Trujillo Formation (Hughes and Willey 1978). These outcrops appear to have been utilized at the site for the procurement of sandstone suitable for grinding implements.

STRUCTURES AND FEATURES

Structure 1

Figure 6 shows the locations of the structures and features at the site. Table 1 summarizes the measurements of Structures 1 and 2. Because only the north wall and a small portion of the west wall of Structure 1 were discernible, the length and width measurements for this structure are approximations. Based on the projected locations of the pithouse walls, Structure 1 appears to be a rectangular, semi-subterranean pithouse with slightly rounded corners (Figure 7). It is shallow with the floor of the structure only about 35 cm bgs. A clay plastered entryway is centered on the east side of the structure and slopes from the floor up to about two centimeters below present ground surface. There is no evidence of a prepared or plastered floor, but rather just smoothing and filling where needed.

Table 1. Dimensions of Structures 1 and 2, Kent Creek Site.

Dimensions	Structure 1		Structure 2	
	m	ft	m	ft
Length	4.3	14.1	3.3	10.8
Width	3.3	10.8	2.3	7.5
Square Floor Area	14.2	152.3	7.6	81.0
Floor Depth*	0.35	1.2	0.33	1.1
Entrance Length	2.2	7.2	2.3	7.5
Entrance Width	1.0	3.3	0.95	3.1
Post Holes (n=4)	cm	in		
Average Diameter	10	4	-	-
Average Depth	15	6	-	-

*Below present ground surface.

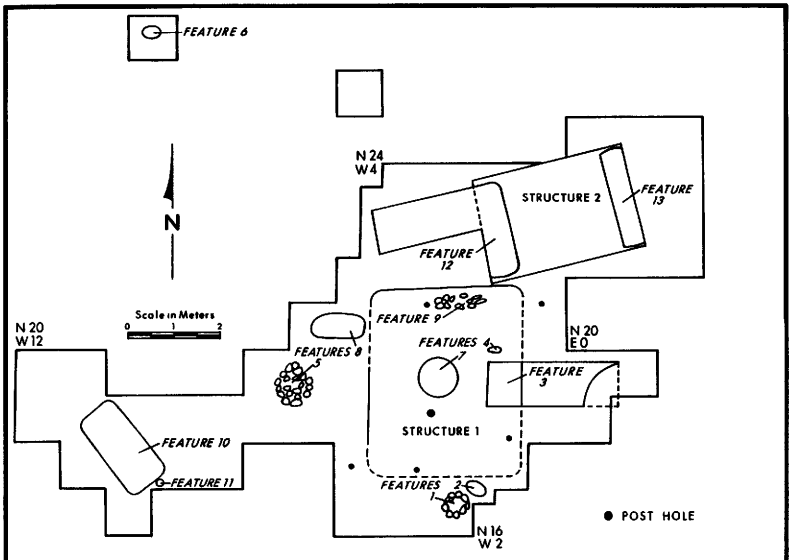

Figure 6. Kent Creek site map showing locations of structures and features.

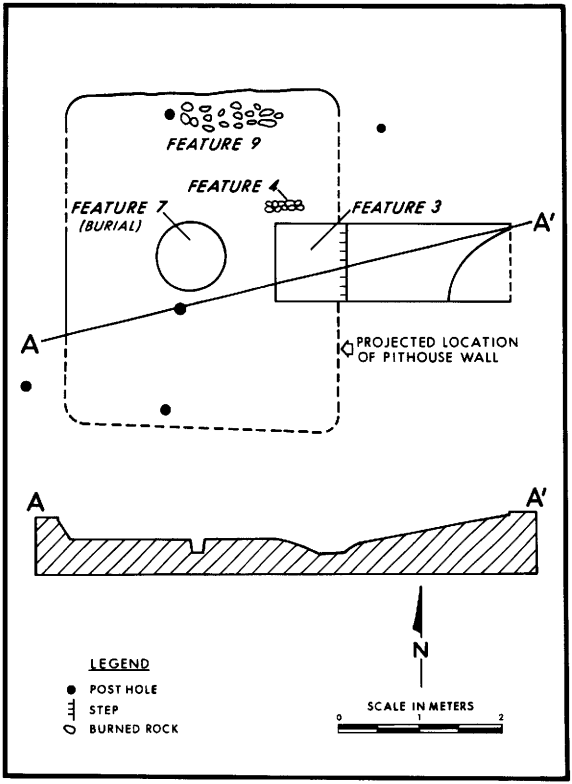

Figure 7. Plan view and cross-section of Structure 1.

Inside the structure four features and four post molds were identified. The features include a step feature (Fe. 3) that separates the entryway from the floor, a small cluster of burned rocks (Fe. 4), a burial (Fe. 7), and a hearth or warming oven (Fe. 9).

Feature 3 (Fe. 3) is a 20 cm deep basin which separates the entrance of the structure from the floor (Figure 7). It is 50 cm long and is the same width as the entrance and apparently is a step.

Feature 4 (Fe. 4) is a small cluster of 10 burned caliche rocks located just inside the structure to the north of the entrance (Figure 7). The rocks are arranged in two parallel rows of five rocks in each row. The purpose of this feature is undetermined.

The burial (Fe. 7; Figure 8), that of a fully mature female, was semi-flexed and placed in a circular pit dug into the floor of the structure. The burial pit is located directly in front of the entrance in the center of the structure (see Figure 7). The pit measured 94 cm north-south by 92 cm east-west with the bottom of the pit approximately 60 cm below the floor of the structure. The fill of the burial was encountered approximately 10 cm above the floor, suggesting that the structure was not occupied after the burial.

As mentioned above, the burial was in a semi-flexed position with the individual lying on her back, head to the west facing southeast. The arms were folded across the chest and the legs were folded to the right and drawn up towards the chest. A bone awl and an awl "blank" (fashioned from deer metapodials) were lying on the chest and a split deer metapodial was placed across the skull. Three mussel shells, one resting on the left clavicle, one on the right clavicle, and one

Figure 8. Burial under floor of Structure 1.

near the upper abdominal area, were also recovered. The tip of an arrowpoint was found under the left clavicle adjacent to the sterile lower margins of the pit. It is not clear, however, if the point tip contributed to the cause of death or if it fell to the bottom of the pit from the upper pit walls at the time of burial. A detailed analysis of the skeletal remains is presented as Appendix I.

Feature 9 (Fe. 9) is a scatter of burned rocks near the north wall of the structure; they appear to be resting on the floor and not in a prepared pit (Figure 9). This feature resembles ones that Wheat (1954) described as warming ovens which he identified at the Crooked Ridge Valley site in Arizona. The features were associated with the

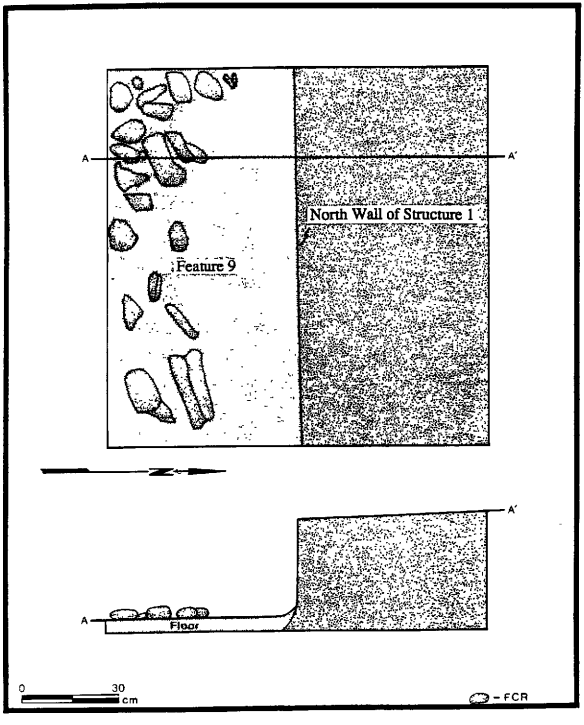

Figure 9. Plan view and cross-section of Feature 9, hearth.

Circle Prairie phase of the Mogollon. Wheat (1954) noted that such features were usually located near one side of the structure and were present in addition to a central hearth.

Four post molds were located inside Structure 1 but no clear pattern was discernible. The post molds were not well preserved and were difficult to discern. The largest post was located near, but not in, the center of the structure. Rather, it is offset some 50 cm south of the center. Of the other post molds, one is near the front wall south of the entrance, one is near the south wall west of center, and one is near the north wall west of center. Two other possible post molds were located outside of Structure 1 but it is not clear if they are associated with the structure.

The average diameter of the post molds is 10 cm and the average depth is 15 cm. The post mold near the center of the structure is about 5 cm larger in diameter than the other three. The pattern of the post molds suggest that the roof was supported by a framework of poles, perhaps in a gabled fashion. The shallowness of the structure and the fact that several pieces of burned daub were recovered from the interior of the structure, suggests that the structure was of wattle and daub construction.

A radiocarbon date of A.D. 710±120 (Tx-no. 5323) was acquired from a scatter of charcoal collected from the floor level of Structure 1. This represents the earliest date yet acquired for structural remains in the Panhandle Plains region.

Structure 2

Structure 2 is located immediately to the northeast of Structure 1 but the two are not contiguous and they differ in several respects. Structure 2 is also relatively shallow, about 33 cm bgs, but it is more distinctly rectangular with nearly square corners (Figure 10) and has a plastered floor. The entrance to this structure is located on the west end and consists of a sloping, plastered ramp approximately 2.3 m long and 95 cm wide.

Structure 2 is significantly smaller than Structure 1 (see Table 1) and it appears to have been constructed differently as well. While four post molds were located inside Structure 1, none could be located for Structure 2 and the means of roof and wall support remain unclear. However, the fill from Structure 2 contained a large number of rocks and patches of packed clay, neither of which were found in Structure 1. Several of the rocks had "smears" of clay plaster on one side suggesting that these were used in wall construction. The rocks and large patches of clay may indicate that there was a partial masonry or jacal superstructure.

Unlike Structure 1, the floor and lower portion of the walls of Structure 2 are clay plastered. Immediately inside the structure, on both the east and west end, are long shallow "troughs" (Features 12 and 13) which extend across virtually the whole width of the structure (Figure 10). Both of these troughs are 20 cm deep and approximately 50 cm wide. Both are clay plastered and in each case the inner edge drops sharply from floor level and then gently slopes up to the outer edge. The function of the troughs is unknown. No other internal

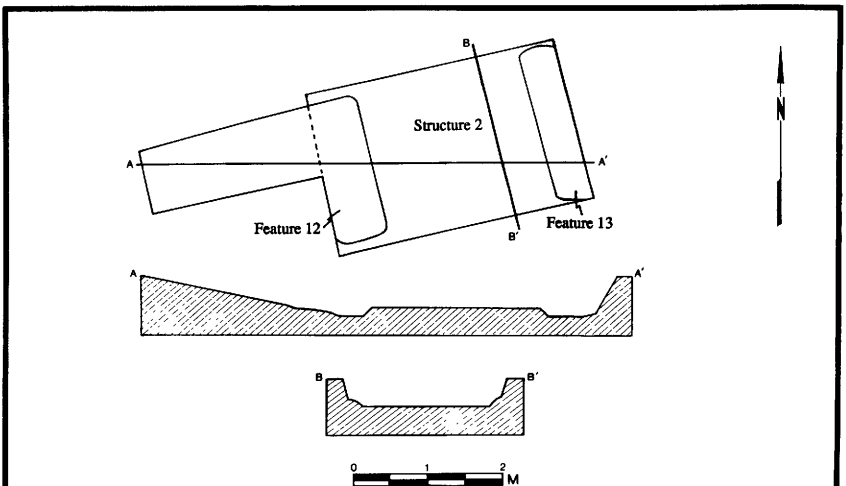

Figure 10. Plan view and cross-section of Structure 2.

features were located and the floor was virtually clean of artifacts except for a single mano in the west trough.

Structure 3-Feature 10 (Fe. 10)

Feature 10 is an oval to sub-rectangular depression which may mark the location of a third structure. Located in unit N17-19 W9-11, the depression is oriented on a northwest-southeast axis and measures approximately 190 cm by 85 cm by 35 cm (Figure 11).

The partial excavation of the feature revealed a large concentration of cobbles and gravels underlying the west half of the depression. Virtually no cobbles were encountered on the east half.

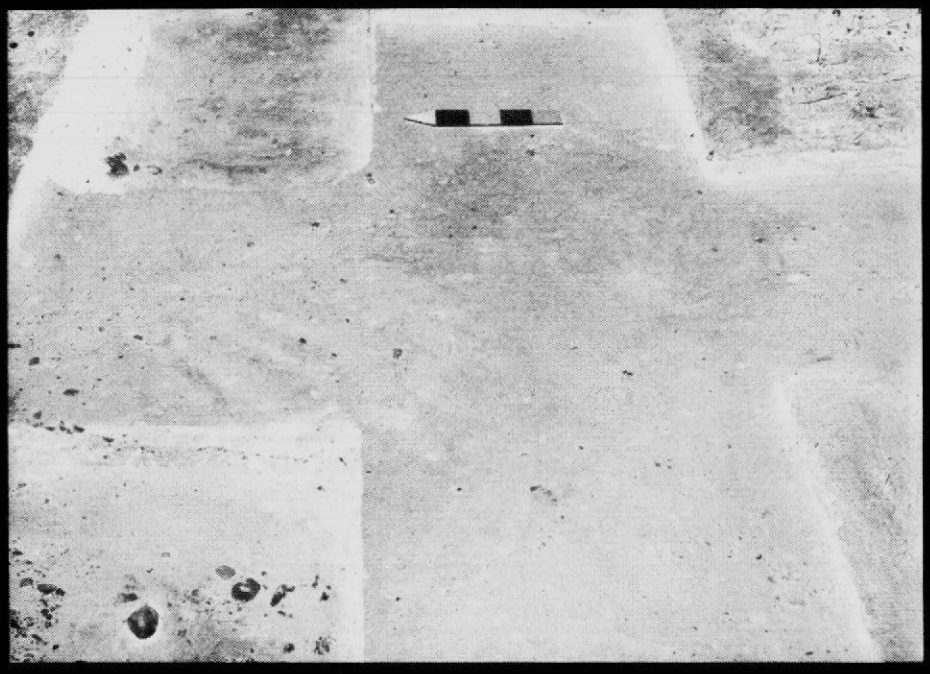

Figure 11. Feature 10 as exposed at the base of Stratum 1. Note the basin shape of the feature as seen in the lower left corner of the photo.

The cobbles terminate abruptly along the west edge of N17-19 W8-9 (Figure 12). In the north wall profile of this unit several pieces of daub were noted. The excavations did not proceed further and the nature of this feature remains undetermined. However, because of the presence of the large depression and the concentration of cobbles and the daub, another structure is indicated.

Figure 12. Concentration of cobbles underlying Feature 10.

Extramural Features

Six features (Features 1, 2, 5, 6, 8 and 11) were located on the outside of the structures during the excavations at 41HL66. Based on soil matrix, associated tools, and debris items, five different functions for the six features are suggested:

Feature 1 (Fe. 1): Small Rock-lined Hearth

This feature, located within Stratum 2b in units N16-17 W2-4, is approximately 60 cm in diameter with very little vertical depth (Figure 13). The hearth consists of a circular concentration of burned rocks and a few small flecks of charcoal. One Middle Pecos Micaceous brownware sherd, possibly from an olla, and two Ellis-like dart point bases were recovered from this feature.

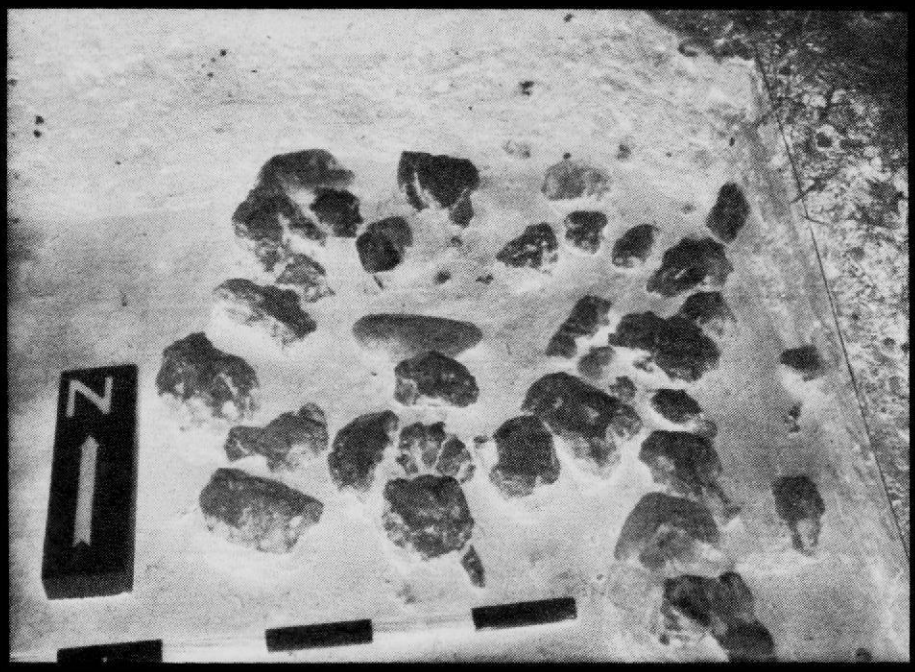

Figure 13. Looking north at Feature 1, rock-lined hearth.

Feature 2 (Fe. 2): Pit

Feature 2 is a small rectangular shaped pit located northeast of but adjacent to Feature 1. The feature is 10 cm deep and is approximately 52 cm in length north-south and 32 cm wide east-west

(Figure 14). The east end of the pit is almost vertical but the west end slopes gently towards the center of the feature. A few small patches of packed clay were noted on the walls and floor of Feature 2. No cultural material was recovered from the fill of this feature.

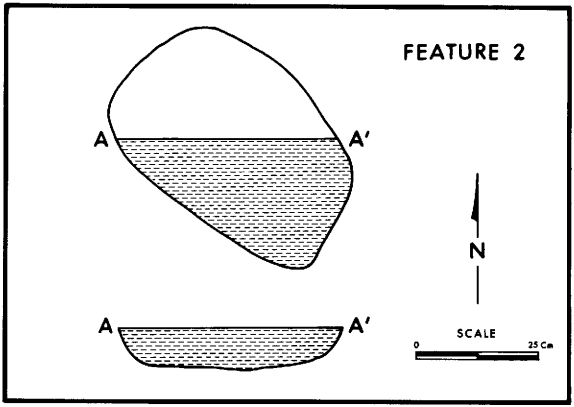

Figure 14. Plan view and cross-section of Feature 2, pit.

Feature 5 (Fe. 5): Large Rock-lined Hearth

This feature is a shallow, rock-lined hearth located in units N18-20 W5-7. It consists of a shallow ash-filled pit capped with burned caliche and sandstone cobbles (Figure 15). The pit was circular and measured approximately 80 cm across and 30 cm deep.

Diagnostic artifacts recovered in direct association with the hearth included three brownware ceramics, one Deadman's arrowpoint, one Scallorn arrowpoint, and three manos. The ceramics include one Roswell Brown sherd, one Jornada Brown sherd possibly from an olla, and one untyped sherd, also from an olla, which appears to be of local manufacture. Also collected were numerous pieces of bone, including a human ulna. The presence of the human ulna in direct association with the hearth is not easily explained. It may be that another burial is located nearby which has been disturbed by bioturbation.

Two charcoal samples were recovered from the feature. The first charcoal sample was collected from the upper portion of the hearth and produced a date of A.D. 1110±250 (Tx-no. 5665). The second sample was collected from the lower portion of the hearth and produced a date of A.D. 790±80 (Tx-no. 5709). The radiocarbon laboratory at the University of Texas indicated that the first sample was small and that it contained a large amount of calcium carbonate which had to be extracted. This accounts for the large standard deviation from the first sample.

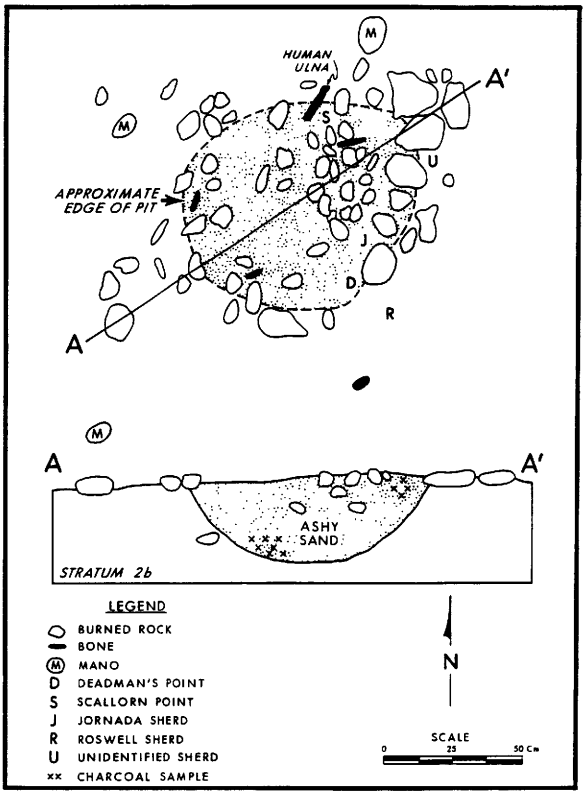

Figure 15. Plan view and cross-section of Feature 5, hearth.

Feature 6 (Fe. 6): Small Open Hearth

Feature 6, encountered in Stratum 2a of Unit N28-29 W10-11, is a very small, shallow ash stain approximately 15 cm in diameter which may represent a small hearth. Several lithic flakes, but no tools or diagnostics, were recovered from the area of the feature.

Feature 8 (Fe. 8): Storage Pit

Feature 8 is an oval shaped pit with a flat bottom and a "domed" clay cap (Figure 16). Located approximately one meter northeast of Feature 5 (hearth), this feature may represent a type of storage pit, though no artifacts were recovered except for two Jornada Brown sherds from the fill of the pit. This feature measures approximately 135 cm east-west by 50 cm north-south and is 30 cm deep.

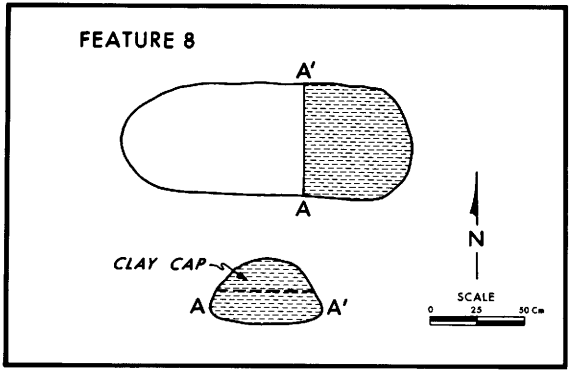

Figure 16. Plan view and cross-section of Feature 8, pit.

Feature 11 (Fe. 11): Mano Cache

Feature 11 is a cache of three manos (Figure 17) located just to the southeast of Feature 10. All three are oval one-hand manos. Two are quartzite and the third is sandstone. A metate fragment was recovered approximately 50 cm east of the manos as were two Roswell Brown sherds, one Jornada Brown sherd, and one Middle Pecos Micaceous Brown sherd.

Figure 17. Feature 11, mano cache. Note metate fragment in background.

CHAPTER VI

ARTIFACT ASSEMBLAGE

A total of 14,319 artifacts plus additional floral, faunal, and house construction materials were recovered at the Kent Creek site. These include chipped and ground stone, ceramic, shell and bone artifacts. An inventory of the artifacts is provided as Appendix II of this report

Since the vast majority of the specimens from the site are lithics, the description of the specimen classes is preceded by a description of the lithic materials.

LITHIC MATERIALS

A total of 13,329 stone items are described, representing 11 different lithic materials. The materials were identified megascopically based on descriptions taken from Hughes and Willey (1978:47), Etchieson (1979:53-58), and Holliday and Welty (1981:201-214). The material types include: Alibates agate (n=188), Dakota quartzite (n=53), Edwards chert (n=40), obsidian (n=8), opaline

(n=40), petrified wood (n=94), Potter chert (n=762), quartzite (n=37), sandstone (n=26), Tecovas jasper (n=12,076), and unidentified chert (n=5). These materials are listed by number and percent on Table 2.

Alibates Agate

This agatized dolomite occurs as nodules and lenses in the Alibates Dolomite Lentil of the Quartermaster Formation of upper Permian age. It crops out on both sides of the Canadian River northeast of Amarillo, and fragments occur in the river gravels downstream from the outcrops. Macroscopically it is characterized by banded colors, usually white and purple. The colors are variable, however, and include browns, yellows, and reds.

Dakota Quartzite

This material is a silica cemented sandstone present in outcrops of the Dakota Formation (late Cretaceous age) in northeastern New Mexico along the western edge of the Llano Estacado. It is a translucent, sugary-textured material with a wide range of light to dark colors produced by various kinds and amounts of iron oxide pigment.

Edwards Chert

This material is a cryptocrystalline quartz from the Edwards Formation of early Cretaceous age. The Edwards Formation consists of fine to medium grained limestone with occasional chert lenses. It is found in the southern Llano Estacado and the Edwards Plateau of Texas. Edwards chert is usually some shade of gray.

Table 2. Lithic Materials from the Kent Creek Site.

Material	Number	Percent
Alibates agate	188	1.41
Dakota quartzite	53	0.40
Edwards chert	40	0.30
Obsidian	8	0.06
Opaline	40	0.30
Petrified wood	94	0.71
Potter chert	762	5.72
Quartzite	37	0.28
Sandstone	26	0.20
Tecovas jasper	12,076	90.60
Unidentified	5	0.04
Total	13,329	100.02

Obsidian

Obsidian is a translucent black or very dark gray volcanic glass. It crops out at several places in the Rocky Mountains, one of the closest sources being near Los Alamos in New Mexico. Levine and Mobley (1976:54) report two other possible locations in New Mexico, closer than the one at Los Alamos. One of these is located at Rowe Mesa near Pecos Pueblo and the other is at Tonque Arroyo near Albuquerque.

Opaline

Opaline, or common opal, is an amorphous form of quartz which occasionally occurs in the Ogallala Formation along the eastern edge of the Llano Estacado. Opal is a hydrated form of silica, usually a lustrous white and sometimes exhibiting various spectral colors. The opal often is found in caliche deposits as irregularly shaped nodules.

Petrified Wood

Petrified wood is a silicified wood frequently occurring in the Potter gravels. Its ultimate source is unknown. Although difficult to flake due to internal planes of weakness, it is widely available within the region of the Rolling Plains.

Potter Chert

This material is a fine-grained quartzite or silicified siltstone, opaque and gray to brown in color, also common among the Potter gravels. It may have originated in the Morrison Formation of late Jurassic age in New Mexico. It is a dense material which most often occurs in the form of large, subangular cobbles.

Quartzite

Quartzite of several kinds and colors occurs in cobble form throughout the Potter gravels and is the most common component of the gravels. This material is quite variable (Etchieson 1979:57), ranging from an igneous (pegmatitic) quartz through a metamorphic (gneissic or schistose) metaquartzite into a sedimentary (silicified sandstone) orthoquartzite, probably from various sources in the Rockies.

Sandstone

Sandstone of different kinds is present in all formations of the Panhandle. The Trujillo Formation, for example, contains massive lenses of predominantly gray to brown micaceous sandstone along the eastern edge of the Llano Estacado.

Tecovas Jasper

This material occurs as lenses, often of considerable extent and thickness, in the mudstones of the Tecovas Formation of upper Triassic age. It crops out along the eastern Llano Estacado from Palo Duro Canyon southward. Residual masses occur along the base of the scarp and fragments occur in the river gravels downstream from these outcrops. It is a bright-colored material; reds, browns, and creams predominate with lesser amounts of yellows, greens, and whites.

Most of the Tecovas at the Kent Creek site appears to have been collected from gravel outcrops around the site, rather than imported from the outcrops a few miles to the west, since much of the debitage retains a water-worn cortex.

Unidentified

Five specimens of unidentified lithic materials were collected at the site. Probably most of this material is from the Plesistocene gravels, which contain a wide variety of igneous, sedimentary, and metamorphic pebbles that mostly are small and colorful.

CHIPPED STONE ARTIFACTS

Lithic technology is a reductive process which eventually leads to the production of chipped and ground stone tools (Collins 1975; Boisvert 1980). Artifacts such as projectile points, knives, unifaces, and intentionally modified flakes are the end-products of such a reductive system. In the process of reducing the selected raw material to the desired form, a variety of items are produced as by-

products. This material is generally referred to as flakes and flaking debris or debitage. Thus, the description of chipped stone artifacts from the Kent Creek site has been divided into three general units: flaking debris, flakes, and chipped stone tools.

FLAKING DEBRIS

Chunks and Chips
Sample size: 7025

Included here are all of the unutilized chunks, chips, spalls, and shatter that exhibit unstandardized, amorphous configurations characterized by the absence of a distinct platform remnant or proximal "end." They represent the totally unstandardized by-products of the flaking operation that fly-off during all stages of core reduction and biface thinning. Pieces of non-diagnostic shatter from the lithic assemblage were subdivided into two categories designated (1) chunks which are differentiated as thick and blocky in configuration, and (2) chips which are differentiated as thin and flat in configuration. Table 3 presents the number and distribution of chips and chunks from the site.

FLAKES

Flakes are flat with conchoidal fracture properties. Flakes are detached from the parent stone (usually a core or biface) by the application of force. Three basic procedures exist for removing flakes from the core or biface: hard hammer percussion, soft hammer percussion, and pressure flaking. Hard hammer percussion involves

Table 3. Distribution of Chunks and Chips by Stratum, Kent Creek Site.

Material Type	1	2a	2b	2c	Fe. 7	Fe. 8	Fe. 10	Total
Alibates Agate	1	12	37					50
Dakota Quartzite		13	8					21
Edwards Chert		1	5			1		7
Obsidian		1						1
Opaline	1	7	18				1	27
Petrified Wood		3	19	4		1	1	28
Potter Chert	10	57	261	27	6		3	364
Quartzite		4	8				1	13
Sandstone			1	3				4
Tecovas Jasper	312	976	4320	440	193	39	227	6507
Unidentified			3					3
Total	324	1074	4680	474	199	41	233	7025

striking the parent stone with another stone. In soft hammer percussion, the core or biface was struck with a softer material, either an antler, wood, or bone. The third technique, pressure flaking, involves the application of pressure against the edge of the parent material, forcing the removal of small flakes. Pressure flaking is most commonly applied in the final stages of tool manufacture when final trimming is accomplished. All three manufacturing procedures may be used in the production of a single tool (Crabtree 1972).

Evidence exists on flakes which permit identification of when and how a flake was removed from the parent stone. In this study, morphological characteristics such as flake shape, striking platform type, condition of the bulb of percussion, flake scars on the exterior

surface, and flake length to width ratios have been used to identify the certain flake types that were removed in the process of tool manufacture.

Primary Flakes
Sample size: 390

These are flakes resulting from the initial reduction of a larger nodule, core, or early stage biface blank. Specimens were assigned to this category on the basis of the following morphological and technological characteristics: (1) greater overall size and thickness; (2) lack of a well-developed ridge or ridges; (3) the presence of cortex on the dorsal surface; and (4) the general absence of evidence of platform preparation. The distribution of primary flakes is presented on Table 4.

Table 4. Distribution of Primary Flakes by Stratum, Kent Creek Site.

Material Type	1	2a	2b	2c	Fe. 7	Fe. 8	Fe. 10	Total
Alibates Agate			2					2
Dakota Quartzite		1	1					2
Edwards Chert			2					2
Obsidian								-
Opaline		2						2
Petrified Wood	1		5	1				7
Potter Chert	2	16	70	5	1		1	95
Quartzite			1					1
Sandstone								-
Tecovas Jasper	19	57	181	8		7	7	279
Unidentified								-
Total	22	76	262	14	1	7	8	390

Secondary Flakes
Sample size: 3984

These include flakes resulting from later stage trimming, thinning, and/or shaping of cores, bifaces, flakes and blade-flakes. These specimens are distinguished by their overall size and shape (generally smaller and thinner than primary flakes), the presence of one or more dorsal ridges, and by the absence of cortex on the dorsal surface and platform remnant. Evidence of platform preparation is common in the form of faceting, abrading, and/or grinding. The distribution of secondary flakes from the site is presented on Table 5.

Table 5. Distribution of Secondary Flakes by Stratum, Kent Creek Site.

Material Type	1	2a	2b	2c	Fe. 7	Fe. 8	Fe. 10	Total
Alibates Agate	2	29	60	2			1	94
Dakota Quartzite		4	14					18
Edwards Chert		1	14					15
Obsidian			3					3
Opaline	2	2	3					7
Petrified Wood	3	8	30	1				42
Potter Chert	14	44	146	19	7	1	4	235
Quartzite	6	2	3					11
Sandstone		1		1				2
Tecovas Jasper	243	781	2105	189	63	45	129	3555
Unidentified			2					2
Total	270	872	2380	212	70	46	134	3984

Tertiary Flakes
Sample size: 1591

Flakes in this category result from final stage trimming, thinning, and shaping of an implement. Flakes from the "maintenance"

of worked implements are also included. Such maintenance activities can include the following: reshaping, rejuvenation, resharpening, and retouching. All such specimens are smaller and thinner than primary and secondary flakes and they show evidence of platform preparation by faceting, grinding, or abrading. Other characteristics include absence of cortex and, in the case of pressure flakes, evidence of small, minute cones and short salient bulbs of force. These flakes were produced predominately by soft hammer percussion and direct hand-held pressure techniques. The distribution of tertiary flakes is presented on Table 6.

Table 6. Distribution of Tertiary Flakes by Stratum, Kent Creek Site.

Material Type	1	2a	2b	2c	Fe. 7	Fe. 8	Fe. 10	Total
Alibates Agate	1	10	21	2				34
Dakota Quartzite		6	3	1				10
Edwards Chert			7				1	8
Obsidian			2				1	3
Opaline		1	1					2
Petrified Wood	1		5	4			1	11
Potter Chert		9	38	1		1		49
Quartzite								-
Sandstone								-
Tecovas Jasper	42	392	889	51	20	18	62	1474
Unidentified								-
Total	44	418	966	59	20	19	65	1591

CHIPPED STONE TOOLS

Chipped stone tools refer to specimens of stone either intentionally modified for tool use or which exhibit various types of use-wear reflective of their use as tools.

Arrowpoints

A total of 56 arrowpoints or arrowpoint fragments were recovered from the Kent Creek site. Of these, 25 are complete or nearly complete and the remaining 31 are stems, tips, barbs, and midsections. Distribution of the complete or nearly complete arrowpoints by analytic unit can be found in Table 7. The arrowpoint fragments are presented in Table 8.

Deadman
Sample size: 10 (Figure 18a-g)

Hughes and Willey (1978:187) defined this point type as having "straight, convex, or concave edges which are commonly serrated. Barbs are slender and long, notches are usually narrow, deep, and from the base but near the corners. The stem is long and slender, expands toward the base, and is often spatulate." Nine of these items are of Tecovas jasper and one is Alibates. One of the points was recovered from the floor of Structure 1; one from Feature 5; and the remainder from the surface, Stratum 2a, or Stratum 2b.

Scallorn
Sample size: 12 (Figure 18h-q)

The Scallorn point is a triangular, corner-notched point with straight to convex lateral edges (often finely serrated) and well-barbed shoulders (Suhm and Jelks 1962). The stem is most commonly broad and wedge-shaped. The base may be straight, convex or concave. The temporal range for the Scallorn point has been placed at A.D. 700-1200 (Turner and Hester 1985), though in the Texas panhandle it has been recovered from contexts dating as early as ca. A.D. 200

(Hughes and Willey 1978). Two of the specimens are Edwards chert, one is Alibates, and the remaining eight are Tecovas jasper. Three of the Scallorn points were associated with features: one from the floor of Structure 1, one associated with Feature 5, and one with Feature 10. The other points were recovered either from the surface or Stratum 2b.

Table 7. Dimensions and Provenience of Arrowpoints, Kent Creek Site.

Point Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness
Deadman	surface	--	Tecovas	27.0mm	19.0mm	3.5mm
Deadman	surface	--	Alibates	--	14.5	3.0
Deadman	surface	--	Tecovas	24.0	17.0	2.5
Deadman	N18-19W3-4	Structure 1	Tecovas	--	16.5	4.0
Deadman	N18-19W5-6	Feature 5	Tecovas	33.0	16.5	3.0
Deadman	N16-17W4-5	Stratum 2a	Tecovas	--	17.0	3.5
Deadman	N17-18W4-5	2a	Tecovas	28.5	16.5	3.5
Deadman	N18-19W3-4	2b	Tecovas	--	--	2.5
Deadman	N16-17W4-5	2b	Tecovas	--	--	3.0
Deadman	N18-19W7-8	2b	Tecovas	--	18.5	3.5
Scallorn	surface	--	Tecovas	30.0	13.5	3.0
Scallorn	surface	--	Tecovas	--	13.0	3.5
Scallorn	surface	--	Tecovas	--	15.5	3.5
Scallorn	N17-18W3-4	Structure 1	Alibates	22.5	15.0	3.5
Scallorn	N18-20W6-7	Feature 5	Edwards	--	11.0	3.0
Scallorn	N18-19W9-10	Feature 10	Tecovas	34.0	13.5	4.0
Scallorn	N17-18W4-5	2b	Edwards	18.0	9.0	3.0
Scallorn	N20-21W5-6	2b	Tecovas	--	14.0	3.5
Scallorn	N16-17W4-5	2b	Tecovas	22.5	13.5	3.0
Scallorn	N17-18W8-9	2b	Tecovas	--	13.0	3.0
Scallorn	N17-18W7-8	2b	Tecovas	21.0	13.0	3.0
Scallorn	N16-17W2-4	1	Tecovas	--	11.5	3.5
Unidentified	N21-22W2-4	2b	Tecovas	--	13.0	3.0
Unidentified*	N18-19W7-8	1	Tecovas	--	12.0	3.0
Unidentified**	N19-20W3-5	2b	Tecovas	18.5	15.0	3.5

*Crude side-notched point; similar to Washita type.
**Corner-notched point with a third notch in the tip.

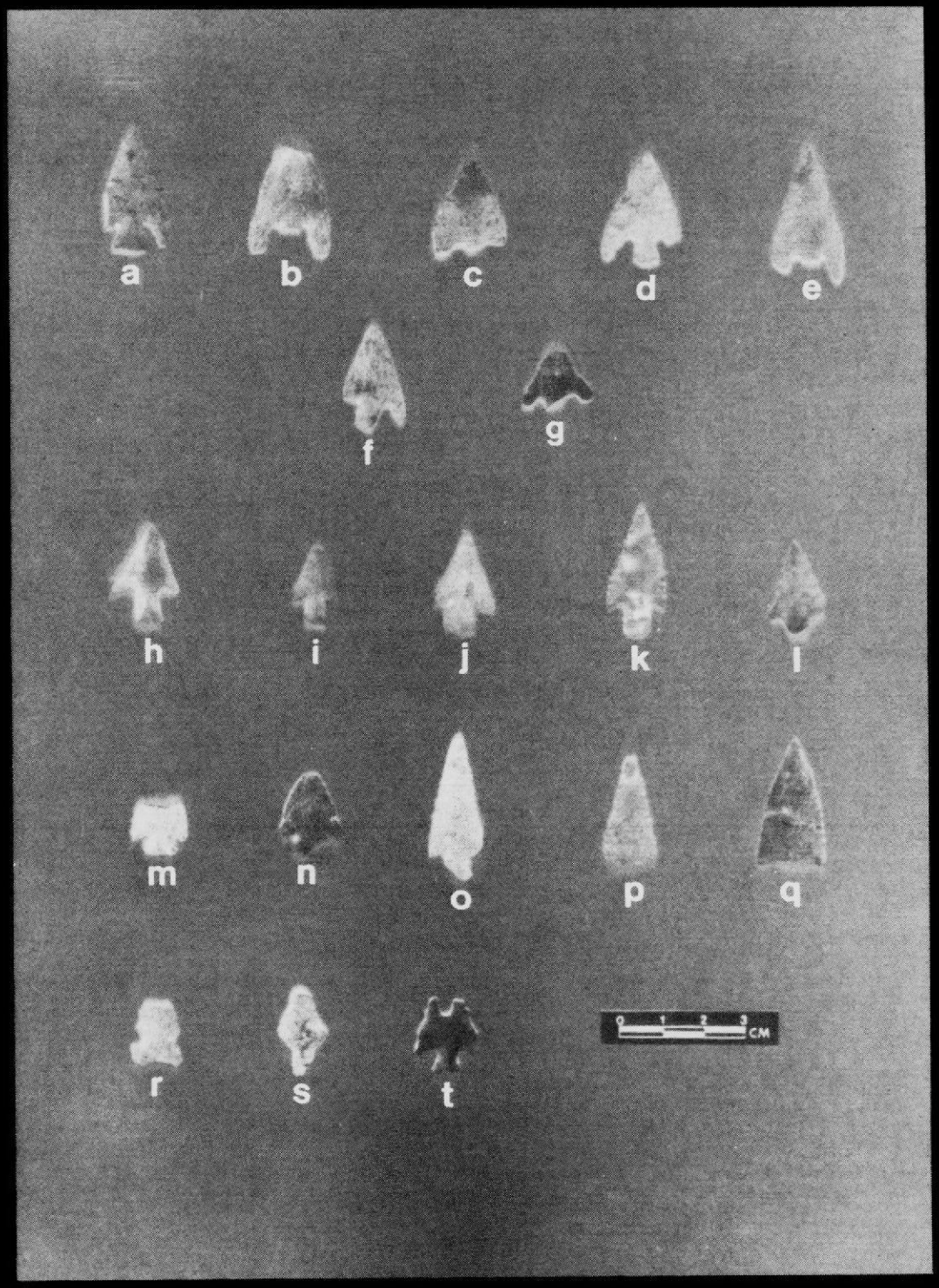

Figure 18. Arrowpoints recovered from the Kent Creek site: a-g, Deadman points; h-q, Scallorn points; r-t, unidentified arrowpoints.

Unidentified Arrowpoints
Sample size: 3 (Figure 18r-t)

These specimens could not be identified to type. All are of Tecovas jasper. One of the specimens is a corner-notched point with a third notch in the tip of the point (Figure 18t). Another specimen is a crudely side-notched point somewhat similar to the Washita type (Figure 18r). The other point has a fragmented tip and an elongated, pointed base.

Arrowpoint Fragments
Sample size: 32

These specimens are all arrowpoint fragments which could not be assigned to a type. Included in this category are stems (n=7), tips (n=15), barbs (n=6), and midsections (n=4). All of the stems can be described as expanding or spatulate-shaped. They are typical of the stems found on the Deadman and Scallorn points. The six barbs are long and slender and are probably from Deadman points. One of the tips was found under the left clavicle of the burial (Feature 7) and one tip and one barb were recovered from Feature 10. All of the specimens are Tecovas jasper except for one of the midsections which is obsidian.

Arrowpoint Preforms
Sample size: 24 (Figure 19a-g)

All of these specimens are Tecovas jasper except for one of Alibates. Only four specimens are complete; the remainder are base fragments. Lateral edges are usually straight to convex. Bases range from rounded to slightly convex. Corners are rounded to sharp. Outlines of these specimens are subtrianguloid to ovate.

Table 8. Arrowpoint Fragments from the Kent Creek Site.

Fragment Type	Unit	Stratum or Feature	Material	Note
stem	N18-19W8-9	Stratum 1	Tecovas	expanding stem
stem	N18-20W10-12	2a	Tecovas	expanding stem
stem	N18-19W7-8	2a	Tecovas	expanding stem
stem	N18-20W6-7	2b	Tecovas	expanding stem
stem	N19-20W2-3	2b	Tecovas	expanding stem
stem	N19-20W3-5	2b	Tecovas	expanding stem
stem	N21-22W2-4	2c	Tecovas	expanding stem
tip	N19-20W1-2	Feature 7	Tecovas	under clavicle
tip	N18-19W9-10	Feature 10	Tecovas	---
tip	N20-21W5-6	1	Tecovas	---
tip	N16-17W2-4	1	Tecovas	---
tip	N18-20E0-1	2a	Tecovas	---
tip	N19-20W1-2	2a	Tecovas	serrated
tip	N17-18W3-4	2a	Tecovas	---
tip	N18-20W10-12	2a	Tecovas	---
tip	N17-18W3-4	2b	Tecovas	---
tip	N18-19W2-3	2b	Tecovas	---
tip	N18-20W6-7	2b	Tecovas	burned
tip	N16-17W4-5	2b	Tecovas	---
tip	N20-21W5-6	2b	Tecovas	---
tip	N18-20W6-7	2b	Tecovas	---
tip	N18-19W8-9	2c	Tecovas	---
barb	N18-19W9-10	Feature 10	Tecovas	Deadman (?)
barb	N17-18W3-4	2a	Tecovas	Deadman (?)
barb	N18-19W5-6	2b	Tecovas	Deadman (?)
barb	N18-19W7-8	2b	Tecovas	Deadman (?)
barb	N20-21W5-6	2b	Tecovas	Deadman (?)
barb	N20-21W4-5	2c	Tecovas	Deadman (?)
midsection	N18-20W6-7	2a	Tecovas	---
midsection	N20-21W3-4	2b	Tecovas	burned
midsection	N19-20W1-2	2b	Tecovas	burned
midsection	N18-19W2-3	2b	Obsidian	---

Artifacts similar to these have been found associated with Deadman points at Deadman's Shelter (Hughes and Willey 1978) and at sites in the Red Deer Creek watershed (Hughes *et al.* 1977). In most reports these have been identified as Young points, with suggestions that they are point preforms. Apparent notching attempts on

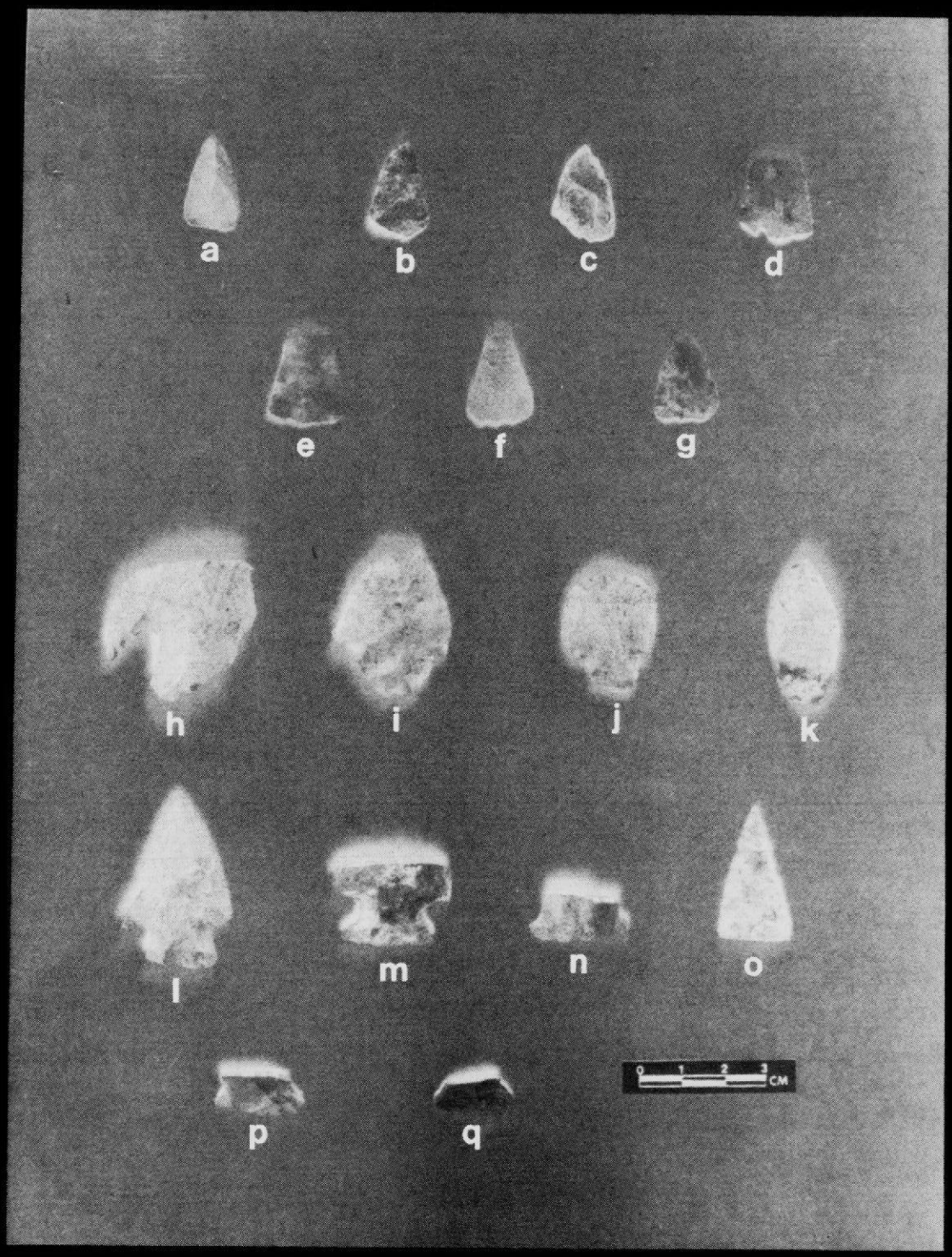

Figure 19. Arrowpoint preforms and dart points recovered from the Kent Creek site: a-g, arrowpoint preforms; h-k, o, unidentified dart points; l-n, p-q, Ellis dart points.

specimens from some sites support this hypothesis. Three specimens from the Kent Creek site exhibit notching attempts. These specimens are classified as preforms, probably for Deadman or Scallorn points, rather than as Young points. Table 9 presents the distribution by analytic unit of the arrowpoint preforms.

Table 9. Dimensions and Provenience of Arrowpoint Preforms from the Kent Creek Site.

Unit	Stratum or Feature	Material	Length	Maximum Width	Thickness	Note
Surface	--	Tecovas	--	15.0mm	3.5mm	notched base
Surface	--	Tecovas	--	11.0	4.0	tip missing
N17-18W2-3	Structure 1	Tecovas	--	18.5	3.0	tip missing
N18-19W9-10	Feature 10	Tecovas	--	21.0	2.5	tip missing
N19-20W3-5	Stratum 1	Tecovas	--	22.5	5.0	notched base
N16-17W2-4	1	Tecovas	--	17.5	6.5	tip missing
N18-20W10-12	1	Tecovas	--	17.0	3.5	tip missing
N19-20W5-6	1	Tecovas	23.0mm	16.0	3.0	complete
N18-20W10-12	2a	Tecovas	--	15.0	3.5	tip missing
N18-19W2-3	2a	Tecovas	--	14.0	3.5	tip missing
N18-20W6-7	2a	Tecovas	22.5	13.0	2.0	complete
N18-19W4-5	2a	Tecovas	--	14.0	4.0	tip missing
N21-22W4-5	2b	Tecovas	20.0	15.0	3.5	complete
N16-17W4-5	2b	Tecovas	--	18.5	3.0	tip missing
N18-20W6-7	2b	Tecovas	--	16.0	2.0	tip missing
N20-21W5-6	2b	Tecovas	--	16.0	3.0	tip missing
N19-20W3-5	2b	Tecovas	--	18.0	3.5	notched base
N18-20W6-7	2b	Tecovas	24.0	14.5	5.0	complete
N16-17W4-5	2b	Alibates	--	14.5	3.5	tip missing
N18-19W7-8	2b	Tecovas	--	18.5	3.0	tip missing
N18-20W6-7	2b	Tecovas	--	18.5	4.5	tip missing
N18-20W6-7	2b	Tecovas	--	--	2.0	tip missing
N18-19W7-8	2b	Tecovas	--	18.5	3.0	tip missing
N21-22W2-4	2c	Tecovas	--	--	3.0	tip missing

Dart Points

A total of 12 dart points or dart point fragments were recovered

from the Kent Creek site. Of these, two specimens are complete; the remaining specimens are tips, stems, and bases. Distribution of the dart points by analytic unit is presented in Table 10. A general typology of dart points has not been worked out for the Panhandle Plains region. Therefore, the dart points from Kent Creek were compared to types from surrounding regions. Five of the dart points can be classified as Ellis or Ellis-like and the other seven are unidentified as to type.

Table 10. Dimensions and Provenience of Dart Points, Kent Creek Site.

Point Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness	Note
Ellis	N16-17W2-4	Feature 1	Tecovas	--	--	--	stem
Ellis	N16-17W2-4	Feature 1	Tecovas	--	--	--	stem
Ellis	N18-19W7-8	Stratum 2a	Tecovas	--	--	--	stem
Ellis	N22-24W2-4	2a	Tecovas	--	29.0mm	7.0mm	basal fragment
Ellis	N18-20W10-12	2b	Tecovas	41.0mm	26.0	6.0	complete
Unident.	Surface	--	Tecovas	35.0	21.0	6.5	lonzenge-shape
Unident.	Surface	--	Tecovas	--	23.0	5.0	reworked tip
Unident.	Surface	--	Tecovas	--	--	10.0	reworked base
Unident.	Surface	--	Tecovas	--	--	5.0	tip
Unident.	Surface	--	Alibates	--	28.0	7.0	side-notched
Unident.	N20-21W2-3	2b	Tecovas	--	--	--	tip
Unident.	N20-21W0-1	2b	Tecovas	--	--	--	tip

Ellis
Sample size: 5 (Figure 19 l-n, p-q)

Turner and Hester (1985:93) describe the Ellis point as having "a short, thick body, shallow corner-notches, barbs and a wide, slightly expanding stem." The one complete specimen from Kent Creek is very

similar to the ones they illustrate. The lateral edges on this specimen are nearly straight, the stem is expanding, and the base is slightly convex.

The other specimens from the site include a basal fragment and three stems from corner-notched points, similar to the one complete specimen. Two of the stems were recovered from Feature 1 (hearth). All of these points are Tecovas jasper.

Unidentified Dart Points
Sample size: 7 (Figure 19h-k, o)

Of the unidentified dart points, two are complete and the others are either tips or basal fragments. One of the complete specimens is lozenge or oval shaped with very weak shoulders. The other complete specimen is a broad, weakly side-notched point of Alibates agate with a converging base. The fragments include four tips (one of which has been reworked) and one basal fragment which has also been reworked. All of these points were recovered from the surface of the plowed field except for two of the tips which were recovered from Stratum 2b.

Bifaces

Bifaces are artifacts that are flaked along both dorsal and ventral surfaces. Based on the earlier discussion of the manufacturing sequence for chipped stone tools, these bifaces have been divided into two types reflecting the degree of completion: bifaces which have received varying degrees of additional thinning and shaping but lack evidence of haft preparation, and those which have only been roughed out to the desired shape.

Type I Bifaces
Sample size: 17 (Figure 20)

These are bifaces which have been flaked or thinned to the final shape and have variable amounts of final trimming. These specimens are Tecovas jasper (n=14), Petrified wood (n=2), and Edwards chert (n=1). Both of the Petrified wood specimens and the Edwards specimen are complete. Only two of the Tecovas specimens are complete. One of the Tecovas specimens was recovered from Structure 1. All of the complete specimens are ovoid or leaf-shaped. The rest of the Type I bifaces are fragmented specimens which include distal fragments (n=4), proximal fragments (n=7), and midsections (n=1). Most of these specimens are so fragmentary that form is difficult to infer, but they were probably ovate in outline like the complete specimens. Type I bifaces probably functioned as cutting or scraping tools. The provenience and dimensions of the Type I bifaces is listed in Table 11.

Type II Bifaces
Sample size: 7

These are bifaces which are characterized by flaking to the roughly desired shape, but final trimming has not occurred. They are Tecovas jasper (n=6) and quartzite (n=1). They are thick, crudely chipped bifaces of various sizes. They may represent blanks, choppers, or cores. The distribution of crude bifaces is presented on Table 11.

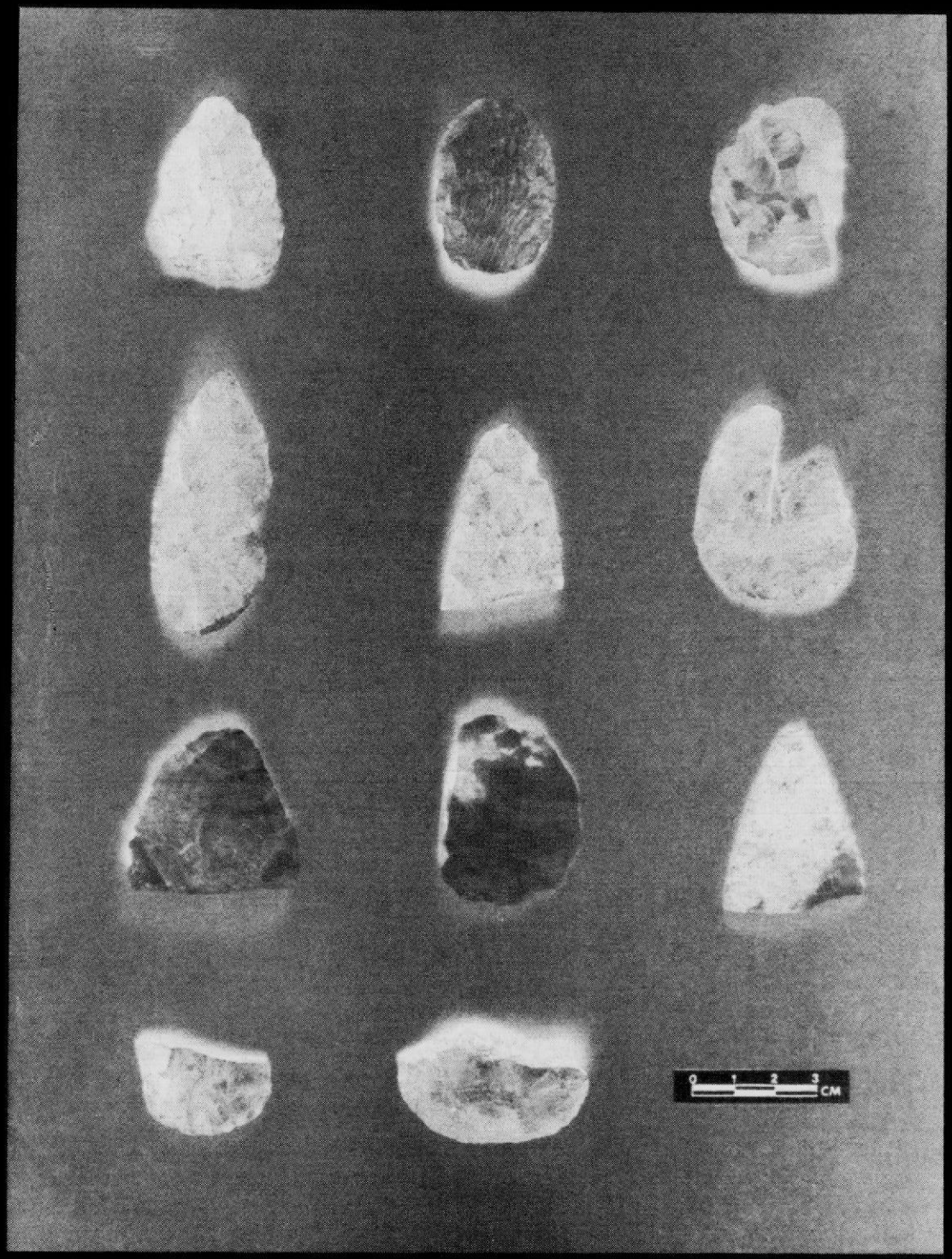

Figure 20. Type I bifaces recovered from the Kent Creek site.

Table 11. Dimensions and Provenience of Type I and Type II Bifaces and Drills from the Kent Creek Site.

Tool Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness	Note
Type I	Surface	--	Edwards	44.5mm	31.5mm	10.0mm	Ovoid
Type I	Surface	--	Tecovas	--	--	5.0	Distal frag.
Type I	Surface	--	Tecovas	--	32.0	5.0	Proximal frag.
Type I	Surface	--	Tecovas	--	44.0	6.5	Proximal frag.
Type I	Surface	--	Tecovas	--	--	10.0	Distal frag.
Type I	Surface	--	Tecovas	--	40.5	10.0	Distal frag.
Type I	N17-18W3-4	Structure 1	Tecovas	63.0	29.0	7.0	Ovoid
Type I	N16-17W2-4	Stratum 1	Pet. wood	45.0	32.0	9.0	Ovoid
Type I	N16-17W2-4	1	Tecovas	--	--	5.0	Distal frag.
Type I	N18-19W8-9	2a	Tecovas	--	48.0	8.0	Proximal frag.
Type I	N16-17W4-5	2a	Tecovas	--	23.0	5.5	Proximal frag.
Type I	N18-19W7-8	2b	Tecovas	--	--	9.5	Midsection
Type I	N18-19Z-3	2b	Tecovas	--	41.0	11.0	Proximal frag.
Type I	N20-21W0-1	2b	Pet. wood	42.5	28.0	9.5	Ovoid
Type I	N21-22W2-4	2b	Tecovas	--	--	6.0	Proximal frag.
Type I	N19-20W5-6	2c	Tecovas	--	--	6.0	Proximal frag.
Type I	N18-20W6-7	2c	Tecovas	46.0	38.0	6.0	Ovoid
Type II	N22-23W0-1	2a	Quartzite	--	70.0	15.0	Proximal frag.
Type II	N20-21W4-5	2b	Tecovas	--	--	--	Fragment
Type II	N18-19W1-2	2b	Tecovas	--	--	--	Fragment
Type II	N21-22W0-2	2b	Tecovas	60.0	27.5	20.0	Minimal retouch
Type II	N17-18W4-5	2b	Tecovas	--	42.0	12.0	Distal frag.
Type II	N18-19W3-4	2b	Tecovas	--	--	--	Fragment
Type II	N19-20W5-6	2b	Tecovas	62.0	32.5	14.0	Minimal retouch
Drill	N17-18W3-4	2b	Tecovas	31.5	25.0	6.5	Flanged base
Drill	N17-18W8-9	2b	Alibates	--	35.5	6.5	T-shaped base

Fragmentary Bifaces
Sample size: 19

These are all Tecovas jasper. They are too fragmentary for functional classification. These specimens include: midsections (n=5), proximal fragments (n=4), distal fragments (n=2), blade fragments (n=3), and unidentified fragments (n=5). Table 12 presents the distribution of these specimens.

Drills
Sample size: 2 (Figure 21a-b)

Drills were probably used to bore a hole. These specimens are Tecovas jasper and Alibates agate. The Tecovas specimen is complete and the Alibates specimen is a base of a T-shaped drill. The complete specimen has a flanged base. The provenience and dimensions of these specimens are listed in Table 11.

Choppers
Sample size: 8 (Figure 21g-h)

These specimens have several flakes removed from both faces of one end. The resulting edge shows heavy battering. Five of these specimens are Potter chert, two are Tecovas jasper, and one is quartzite. The quartzite specimen was recovered near the north interior wall of Structure 1. Table 13 presents the dimensions and distribution by analytic unit of the choppers.

Cores
Sample size: 91

This class includes core remnants. Lithic materials are Tecovas jasper (n=74), Potter chert (n=11), petrified wood (n=2), opaline (n=2), Dakota quartzite (n=1), and Alibates agate (n=1). The specimens are small to moderately large percussion-flaked cobbles. Several of the cores are battered from use as hammerstones. Two-thirds of the cores retain some cortex. This indicates that the inhabitants were obtaining workable cobbles from the gravel deposits in the local area rather than importing the flint from the quarries a few miles to the west. The one-third which do not retain any cortex

are generally smaller, suggesting core remnants or exhausted cores. The distribution of cores is presented in Table 14.

Table 12. Distribution of Unidentified Biface Fragments from the Kent Creek Site.

Unit	Stratum or Feature	Material	Length	Maximum Width	Thickness	Note
N16-17W2-4	Stratum 1	Tecovas	--	--	--	Distal frag.
N17-18W3-4	1	Tecovas	--	--	--	Midsection
N18-20W10-12	2a	Tecovas	--	--	--	Proximal frag.
N28-29W11-12	2a	Tecovas	--	--	--	Fragment
N22-23W0-1	2b	Tecovas	--	--	--	Blade frag.
N18-19W2-3	2b	Tecovas	--	--	--	Blade frag.
N18-19W5-6	2b	Tecovas	--	--	--	Midsection
N20-21W1-2	2b	Tecovas	--	--	--	Proximal frag.
N20-21W0-1	2b	Tecovas	--	--	8.0	Midsection
N19-20W3-5	2b	Tecovas	--	--	--	Blade frag.
N28-29W11-12	2b	Tecovas	--	--	5.0	Midsection
N18-19W9-10	2b	Tecovas	--	--	10.0	Proximal frag.
N17-18W8-9	2b	Tecovas	--	19.0	4.5	Midsection
N18-19W7-8	2b	Tecovas	--	24.5	9.0	Proximal frag.
N18-19W7-8	2b	Tecovas	--	--	--	Fragment
N21-22W2-4	2b	Tecovas	--	--	--	Fragment
N16-17W2-4	2b	Tecovas	--	--	--	Distal frag.
N16-17W2-4	2b	Tecovas	--	--	--	Fragment
N18-20W6-7	2b	Tecovas	--	--	--	Fragment

Table 13. Dimensions and Provenience of Choppers, Kent Creek Site.

Unit	Stratum or Feature	Material	Length	Maximum Width	Thickness
Surface	--	Tecovas	83.5mm	61.0mm	20.0mm
Surface	--	Potter	66.0	71.0	24.0
N20-21W1-2	Structure 1	Quartzite	82.5	80.0	39.0
N19-20W1-2	Stratum 2a	Tecovas	90.0	67.5	40.5
N19-20W3-5	2b	Potter	106.0	73.5	36.5
N16-17W4-5	2b	Potter	93.5	90.0	39.0
N21-22W2-4	2b	Potter	83.5	70.0	32.0
N18-19W4-5	2b	Potter	78.0	80.0	21.0

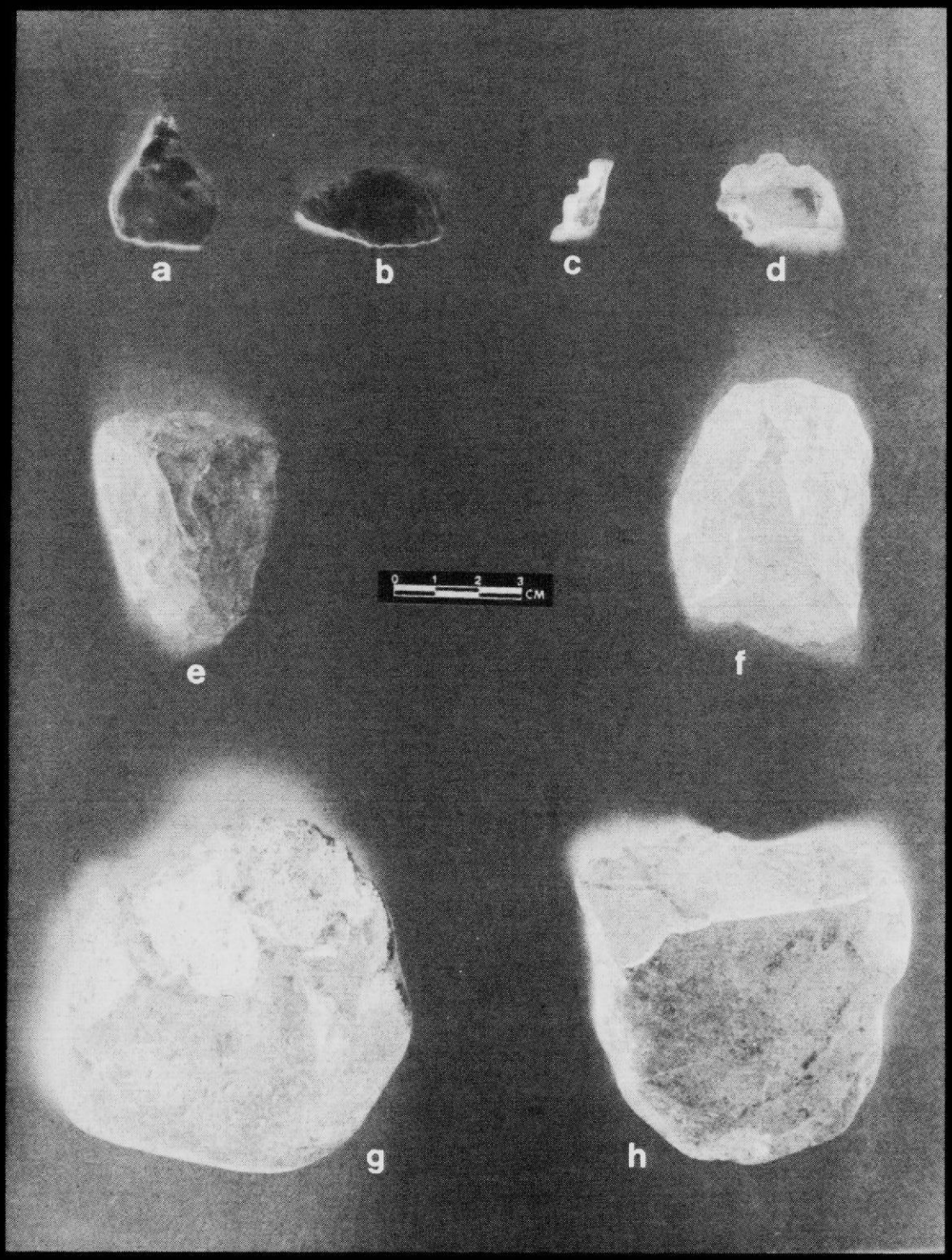

Figure 21. Drills, spokeshaves, gouges, and choppers from the Kent Creek site: a-b, drills; c-d, spokeshaves; e-f, gouges; g-h, choppers.

Table 14. Distribution of Cores by Stratum, Kent Creek Site.

Material Type	1	2a	2b	2c	Fe. 7	Fe. 10	Total
Alibates			1				1
Dakota			1				1
Opaline			2				2
Petrified Wood		1	1				2
Potter Chert		3	8				11
Tecovas Jasper	7	16	44	4	1	2	74
Total	7	20	57	4	1	2	91

Unifacial Tools

Unifacial tools are those in which only one face has been worked or modified through use. Tools in this category include scrapers, spokeshaves, gouges, and modified flakes. The distribution of these tools by analytic unit is presented in Table 15.

Side Scrapers
Sample size: 20 (Figure 22e-j)

Side scrapers are trimmed on one or two edges and may have a combination of side and end trimming. Eight of these specimens are complete and the rest are fragments. All of the complete specimens are Tecovas. Of the fragments, eight are Tecovas, two are Alibates, and two are Edwards. One of the complete specimens and one of the fragments were recovered near Feature 9 (hearth) in Structure 1.

End Scrapers
Sample size: 5 (Figure 22k-m)

End scrapers are trimmed to a steep and convex bit at the end of the longest axis (Turner and Hester 1985:233). Of these specimens,

Table 15. Unifacial Tools from the Kent Creek Site.

Tool Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness	Note
side scraper	surface	--	Tecovas	40.5mm	23.0mm	8.0mm	complete
side scraper	surface	--	Tecovas	41.0	26.0	5.5	complete
side scraper	surface	--	Tecovas	43.5	30.5	11.5	complete
side scraper	N20-21W2-3	Structure 1	Tecovas	--	--	--	fragment
side scraper	N20-21W1-2	Structure 1	Tecovas	44.5	30.0	13.0	complete
side scraper	N19-20W2-3	Feature 7	Alibates	--	--	--	from fill
side scraper	N16-17W2-4	Stratum 1	Tecovas	43.0	21.0	7.0	complete
side scraper	N19-20W5-6	1	Edwards	--	--	--	fragment
side scraper	N18-20W10-12	2a	Alibates	--	--	--	fragment
side scraper	N18-19W0-1	2a	Tecovas	56.0	23.5	6.5	complete
side scraper	N20-21W3-4	2a	Edwards	--	--	--	fragment
side scraper	N18-19W3-4	2a	Tecovas	--	--	--	fragment
side scraper	N18-19W8-9	2b	Tecovas	53.0	20.5	9.5	complete
side scraper	N16-17W4-5	2b	Tecovas	47.0	33.0	8.5	complete
side scraper	N18-19W5-6	2b	Tecovas	--	--	--	fragment
side scraper	N18-19W4-5	2b	Tecovas	--	--	--	fragment
side scraper	N16-17W2-4	2b	Tecovas	--	--	--	fragment
side scraper	N17-18W8-9	2b	Tecovas	--	--	--	fragment
side scraper	N18-20W6-7	2c	Tecovas	--	--	--	fragment
side scraper	N18-19W5-6	2c	Tecovas	57.5	34.0	10.0	complete
end scraper	N18-19W9-10	Feature 10	Tecovas	--	--	--	bit frag.
end scraper	N16-17W4-5	2a	Potter	--	--	--	bit frag.
end scraper	N20-21W4-5	2b	Tecovas	--	--	--	bit frag.
end scraper	N18-19W7-8	2b	Pet. wood	--	--	--	bit frag.
end scraper	N17-18W8-9	2b	Edwards	41.5	30.0	9.0	complete
flake scraper	N25-26W4-5	1	Tecovas	--	--	--	fragment
flake scraper	N19-20W2-3	2a	Tecovas	--	--	--	fragment
flake scraper	N18-20W10-12	2a	Tecovas	--	--	--	fragment
flake scraper	N17-18W8-9	2a	Tecovas	--	--	--	fragment
flake scraper	N19-20W3-5	2b	Tecovas	28.0	11.0	3.0	complete
flake scraper	N28-29W11-12	2b	Tecovas	--	--	--	fragment
flake scraper	N19-20W5-6	2b	Tecovas	--	--	--	fragment
spokeshave	N18-19W2-3	Structure 1	Edwards	--	--	12.0	fragment
spokeshave	N18-19W9-10	Feature 10	Tecovas	--	17.0	3.5	fragment
spokeshave	N19-20W5-6	2c	Tecovas	--	--	5.5	fragment
spokeshave	N19-20W5-6	2c	Tecovas	--	--	5.0	fragment
gouge	surface	--	Potter	54.0	42.5	20.0	complete
gouge	N21-22W2-4	2b	Potter	60.0	46.5	26.5	complete
modified flake	surface	--	Dakota	--	19.0	2.5	fragment
modified flake	surface	--	Tecovas	29.0	21.0	6.0	complete
modified flake	N19-20W2-3	Feature 7	Tecovas	30.0	20.0	3.0	from fill
modified flake	N19-20W2-3	Feature 7	Tecovas	--	13.0	2.5	from fill
modified flake	N19-20W2-3	Feature 7	Pet. wood	--	--	2.0	from fill
modified flake	N20-21W4-5	Feature 8	Tecovas	24.0	--	4.5	from fill

Table 15. Continued.

Tool Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness	Note
modified flake	N25-26W4-5	Stratum 1	Tecovas	--	19.5mm	5.0mm	fragment
modified flake	N16-17W2-4	1	Tecovas	--	--	3.5	burned
modified flake	N17-18W3-4	1	Tecovas	33.5mm	14.0	3.0	complete
modified flake	N19-20W5-6	1	Tecovas	42.0	29.0	13.5	complete
modified flake	N25-26W4-5	1	Tecovas	31.0	--	3.5	fragment
modified flake	N17-18W3-4	2a	Tecovas	31.0	19.0	5.0	complete
modified flake	N25-26W4-5	2a	Tecovas	31.0	21.0	6.0	complete
modified flake	N20-21W0-1	2a	Tecovas	--	27.5	6.0	fragment
modified flake	N18-19W4-5	2b	Tecovas	29.0	18.0	7.5	complete
modified flake	N19-20W2-3	2b	Tecovas	--	18.0	2.5	fragment
modified flake	N17-18W4-5	2b	Tecovas	--	--	--	fragment
modified flake	N21-22W4-5	2b	Tecovas	28.0	21.0	4.0	complete
modified flake	N17-18W3-4	2b	Tecovas	30.0	20.0	7.0	complete
modified flake	N18-19W3-4	2b	Tecovas	--	--	3.0	fragment
modified flake	N18-19W3-4	2b	Tecovas	--	22.0	7.0	fragment
modified flake	N18-19W8-9	2b	Tecovas	36.0	24.0	8.5	complete
modified flake	N18-19W8-9	2b	Tecovas	--	--	4.0	fragment
modified flake	N18-20W6-7	2b	Tecovas	43.5	--	12.0	fragment
modified flake	N19-20W1-2	2b	Tecovas	37.5	19.5	15.0	complete
modified flake	N21-23W1-3	2b	Tecovas	--	19.0	3.0	fragment
modified flake	N18-20W6-7	2b	Tecovas	--	27.5	5.0	fragment
modified flake	N18-19W8-9	2b	Tecovas	--	--	4.0	burned
modified flake	N19-20W5-6	2b	Tecovas	22.0	14.5	3.5	complete
modified flake	N16-17W4-5	2b	Tecovas	--	--	--	fragment
modified flake	N18-19W5-6	2b	Edwards	48.0	24.0	11.0	complete
modified flake	N20-21W1-2	2c	Tecovas	--	16.5	2.5	fragment
modified flake	N19-20W5-6	2c	Tecovas	53.0	39.0	5.5	complete
modified flake	N18-20W6-7	2c	Tecovas	--	--	--	fragment

four are bit fragments and one is complete. The complete specimen is Edwards chert. The other specimens are Tecovas (n=2), Potter chert (n=1), and Petrified wood (n=1). The complete specimen is a thin flake with a steep bit on the distal end of the flake, produced by work on the outer face.

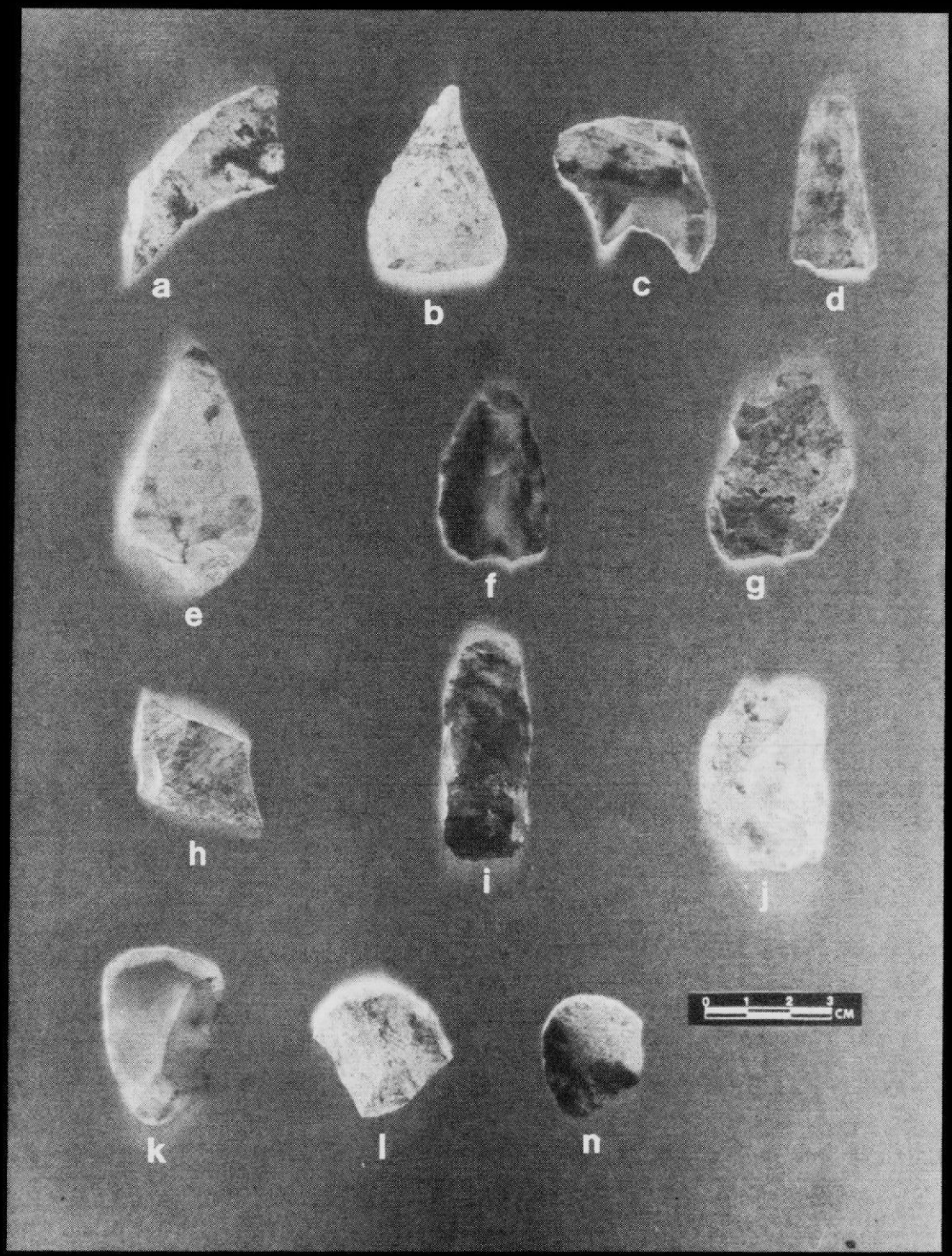

Figure 22. Scrapers recovered from the Kent Creek site: a-d, flake scrapers; e-j, side scrapers; k-m, end scrapers.

Flake Scrapers
Sample size: 7 (Figure 22a-d)

These are flakes which have one worked edge. This edge is usually convex, but straight, concave, and irregular edges do occur. In most cases the modified edge has had deliberate work or retouch, although the retouch on some specimens may be the result of use. These artifacts range from small, thin flake fragments to large, thick, complete flakes. Most of the incomplete specimens may be fragments of another tool class, such as side or end scrapers. All of the flake scrapers are Tecovas jasper.

Spokeshaves
Sample size: 4 (Figure 21c-d)

These are flakes which have a worked or worn concavity along one edge or end. Two have multiple worked concavities. The spokeshaves range from thin to moderately thick. The specimens show minimal work other than in the concavity. One of the specimens is Edwards chert and the other three are Tecovas jasper. The Edwards chert specimen was recovered from Structure 1. Distribution of the spokeshaves by analytic unit is presented in Table 15.

Gouges
Sample size: 2 (Figure 21e-f)

These specimens are Potter chert. Both are subtriangular in outline and the bit on each is steep and beveled. In cross-section, both are plano-convex. Gouges occur frequently on the Rolling Plains and are usually associated with Late Archaic sites. The distribution of the gouges by analytic unit is presented in Table 15.

Modified Flakes
Sample size: 34

These are flakes and flake fragments which show damage or use-wear along an edge or end. The damage in some cases may be accidental. Most of these tools were probably used for one job and then discarded. Some of the fragments may be broken side or end scrapers. These specimens are Tecovas jasper (n=31), Edwards chert (n=1), Dakota quartzite (n=1), and Petrified wood (n=1). Distribution of the modified flakes by analytic unit is presented in Table 15.

GROUND AND PECKED STONE ARTIFACTS

Ground and pecked artifacts refers to nonchipped stone artifacts which have been manufactured by pecking, battering, or grinding. Any of these techniques may have been used in the manufacture of a specific item. Specimens in this category include manos, metates, and hammerstones. Table 16 presents the proveniences and dimensions of the ground and pecked stone artifacts.

Manos
Sample size: 20 (Figure 23)

Of the 20 manos recovered, eight are complete and the rest are fragments. Based on the complete specimens, two basic styles of manos are present. One style is longer and subrectangular in shape, whereas the other is roughly oval. Researchers in New Mexico (Lancaster 1984) and in western Oklahoma (Brooks 1987) have suggested that the longer, more rectangular manos may have been used with trough metates while the oval manos could be more easily used with circular grinding

Table 16. Ground and Pecked Stone Artifacts from the Kent Creek Site.

Tool Type	Unit	Stratum or Feature	Material	Maximum Length	Width	Thickness	Note
mano	N17-18W2-3	Structure 1	sandstone	115.5mm	90.5mm	31.5mm	Unifacial-beveled
mano	N22-23W1-2	Feature 12	sandstone	140.0	77.0	26.0	Unifacial-beveled
mano	N19-20W5-6	Feature 5	sandstone	114.0	87.0	40.0	Unifacial
mano	N19-20W5-6	Feature 5	quartzite	--	--	--	Bifacial-fragment
mano	N17-18W9-10	Feature 10	sandstone	97.0	83.0	30.0	Unifacial
mano	N17-18W8-9	Feature 11	quartzite	119.0	87.5	40.0	Unifacial
mano	N17-18W8-9	Feature 11	quartzite	102.5	90.0	57.0	Bifacial
mano	N17-18W8-9	Feature 11	sandstone	136.0	99.0	30.5	Bifacial
mano	N16-17W2-4	Stratum 2b	sandstone	--	92.0	36.0	Unifacial fragment
mano	N16-17W2-4	2b	sandstone	--	--	31.0	Unifacial fragment
mano	N16-17W2-4	2b	sandstone	--	78.5	37.5	Unifacial fragment
mano	N18-20W6-7	2b	sandstone	--	73.0	36.0	Unifacial fragment
mano	N20-21W5-6	2b	quartzite	--	90.0	31.0	Unifacial fragment
mano	N18-20W6-7	2b	quartzite	--	88.0	47.5	Unifacial fragment
mano	N18-19W3-4	2b	quartzite	--	70.0	55.0	Unifacial fragment
mano	N18-19W4-5	2b	quartzite	--	75.5	56.5	Unifacial fragment
mano	N17-18W2-3	2b	quartzite	--	84.0	59.0	Unifacial fragment
mano	N18-19W7-8	2b	sandstone	106.0	83.0	29.0	Bifacial
mano	N18-19W7-8	2b	sandstone	--	--	--	fragment
mano	N18-19W3-4	2b	sandstone	--	--	--	fragment
metate	surface	--	sandstone	--	--	--	edge fragment
metate	surface	--	sandstone	--	--	--	edge fragment
metate	surface	--	sandstone	--	--	--	edge fragment
metate	N17-18W8-9	2b	sandstone	--	--	--	edge fragment
metate	N18-19W5-6	2b	sandstone	--	--	--	edge fragment
metate	N17-18W3-4	2b	sandstone	--	--	--	edge fragment
metate	N21-22W0-2	2b	sandstone	--	--	--	edge fragment
metate	N17-18W7-8	2b	sandstone	--	--	--	edge fragment
hammer	N18-19W3-4	2b	quartzite	100.5	73.0	72.0	ends battered
hammer	N16-17W2-4	2b	quartzite	90.0	70.0	65.5	ends battered

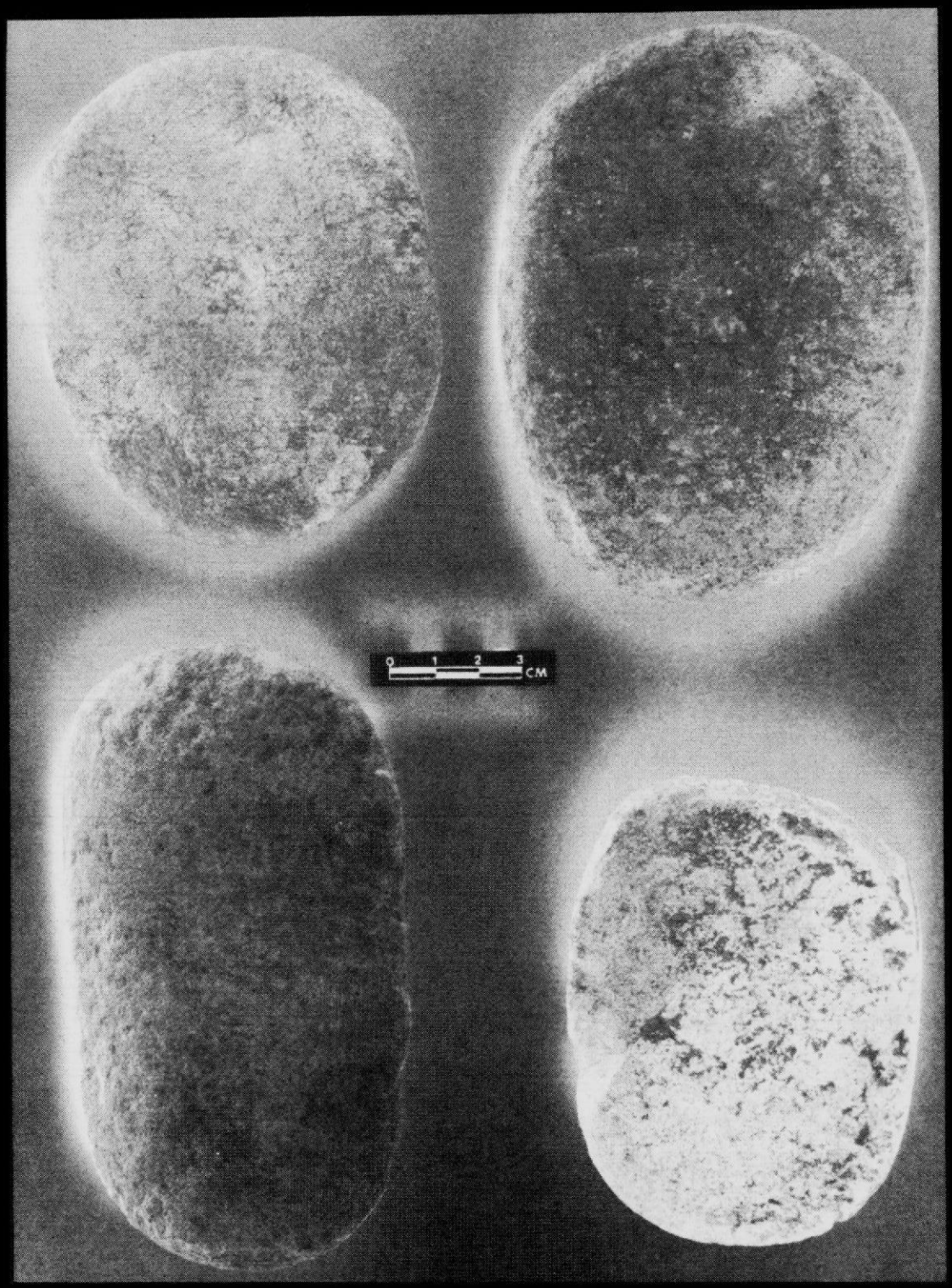

Figure 23. Manos recovered from the Kent Creek site.

basins or slabs. Although oval manos (n=11) are more common than the subrectangular manos (n=5), there does not appear to be a significance to their spatial distributions.

Of the complete manos, three exhibit grinding on both faces and five are unifacially ground. Two of the unifacial manos have beveled edges. According to Lancaster (1984:251), whether the surface of a mano is flat or beveled results from differences in the manner in which pressure was applied to the mano, and to a lesser extent on the shape of the surface of the metate used. Briefly, flat manos result from the application of very even pressure. Beveled manos are produced by consistently applying pressure to the trailing edge of the mano. Periodically flipping the mano over or turning it around results in a distinctly beveled surface. Such wear could only be produced from the use of a reciprocal grinding motion.

Metates
Sample size: 8

Metates are large slabs of stone which have been used as a base in processing plant materials. These specimens are sandstone. They are very fragmentary and no significant dimensions can be taken. Two of the fragments fit together but do not form a complete metate. One of the specimens represents a thick slab, probably with a deep concavity. The other specimens are edge fragments from fairly thin slabs, probably with shallow grinding concavities.

Hammerstones
Sample size: 2

These specimens are quartzite. Both exhibit extensive battering

on the ends. Given the amount of debitage recovered from the site, it is felt that the scarcity of hammers in the artifact sample does not reflect the frequencey of hammers at the site, but rather reflects the probability that they were overlooked or not recognized by the excavators.

CERAMIC ANALYSIS

Thirty-four ceramic sherds were recovered from the site. All of these specimens are body sherds. Six of the sherds were identified as olla sherds. The ceramics were submitted to John Hedrick of the El Paso Archaeological Society who identified the sherds according to the following types: Jornada Brown, Roswell Brown, Middle Pecos Micaceous Brown, and one unidentified plain brown sherd with 70% sand temper which appears to be of local manufacture. Table 17 presents the distribution of the sherds from the site. The descriptions for the ceramic types are taken from Jelinek (1967).

Jornada Brown
Sample size: 16

Jornada Brown is a smooth surfaced ware generally tempered with metamorphic or granitic derivatives which have been crushed or ground. Angular fragments of feldspar are most common, with secondary fragments of quartz and infrequent particles of mica. Size of particles varies from over 3 mm to microscopic. Particle size in the sherds from Kent Creek range from 0.25 mm to 1.5 mm and are moderately abundant. The method of manufacture is by coiling. Wall thickness ranges from 4-9 mm. The paste is tan to black with a frequent black

Table 17. Distribution of Ceramics, Kent Creek Site.

Ceramic Type	Unit	Stratum or Feature
Jornada Brown	Surface	--
Jornada Brown	Surface	--
Jornada Brown*	N19-20W5-6	Feature 5
Jornada Brown	N19-20W4-5	Feature 8
Jornada Brown	N20-21W5-6	Feature 8
Jornada Brown	N18-19W9-10	Feature 10
Jornada Brown*	N20-21W1-2	Structure 1
Jornada Brown	N20-21W2-3	Structure 1
Jornada Brown	N18-19W3-4	Stratum 2a
Jornada Brown	N18-20W10-12	Stratum 2a
Jornada Brown	N20-21W3-4	Stratum 2b
Jornada Brown	N20-21W4-5	Stratum 2b
Jornada Brown	N18-19W7-8	Stratum 2b
Jornada Brown	N17-18W8-9	Stratum 2b
Jornada Brown	N20-21W0-1	Stratum 2b
Jornada Brown	N21-22W0-2	Stratum 2c
Roswell Brown	Surface	--
Roswell Brown	N16-17W2-4	Feature 1
Roswell Brown	N18-19W5-6	Feature 5
Roswell Brown	N19-20W2-3	Structure 1
Roswell Brown*	N20-21W1-2	Structure 1
Roswell Brown	N25-26W4-5	Stratum 2a
Roswell Brown	N18-20W10-12	Stratum 2b
Roswell Brown	N18-20W10-12	Stratum 2b
Roswell Brown	N17-18W8-9	Stratum 2b
Roswell Brown*	N17-18W8-9	Stratum 2b
Roswell Brown	N18-20W6-7	Stratum 2c
Middle Pecos Brown	N21-22W0-2	Structure 1
Middle Pecos Brown	N19-20W1-2	Stratum 2a
Middle Pecos Brown	N20-21W3-4	Stratum 2a
Middle Pecos Brown	N17-18W7-8	Stratum 2b
Middle Pecos Brown*	N17-18W3-4	Stratum 2b
Middle Pecos Brown	N18-19W3-4	Stratum 2b
Unidentified Brown*	N18-19W5-6	Feature 5

*Olla sherd

core. Hardness varies considerably, although some correlation with the amount of temper is present. Fracture is generally slightly to very friable. Finish on vessels is frequently polished over a hand-

smoothed exterior on ollas. Some tool-smoothed finish without polish also occurs. Interiors are hand or tool-smoothed. Vessel forms include ollas and bowls with direct rims, and also seed jars. Two of the Jornada Brown sherds from Kent Creek were identified as olla sherds.

Roswell Brown
Sample size: 11

Roswell Brown is tempered with crushed granitic derivatives, with a predominance of feldspar and quartz. Mica and magnetite are sometimes present in very small amounts. Particle sizes range from 0.2 mm to 3.0 mm. Density of particles is heavy. The weathered granite particles are occasionally oxidized to orange-red; these red specks in the temper form one of the characteristics of the type. The method of construction is by coiling. Paste color is tan to black with the most frequent shade being a dark tan. Black fire-clouding and black cores are frequent. Hardness is medium and the fracture is friable to crumbly. Wall thickness ranges from 5-10 mm and averages about 6 mm. Surface finish is by tool-smoothing and polishing on interiors of bowls and exteriors of ollas. Polish on bowl interiors is extremely well executed. The fine finish of polished surfaces suggests floating. Vessel forms are ollas and bowls. Rims are most commonly flattened or slightly flattened. Direct rims occur rarely. Ollas appear to have the wide mouth and neck like those for Jornada Brown. Two of the Roswell Brown sherds from Kent Creek are from ollas.

Middle Pecos Micaceous Brown
Sample size: 6

As the name suggests, temper in these sherds consists of small flakes of mica abundantly distributed through the paste and concentrated on wall surfaces. Other tempering agents include feldspar, quartz, and some magnetite is always present. Rock particles vary from about 1.5 mm to microscopic, with the average range of the larger particles about 0.5 to 0.8 mm. Density of the particles is moderate to heavy. Paste color is tan to black with frequent black cores. Hardness is fairly constant, with fracture usually quite friable. Construction is by coiling. Wall thickness is from 2.5 to 9.0 mm, with the average being 6-7 mm. Surface finish is tool-smoothed on both the interior and exterior. Mica is the only temper element apparent on vessel walls and just beneath the surface, suggesting floating. Vessel forms are ollas and bowls. Rims are direct and somewhat less attenuated or extended than in Jornada ollas, resulting in a shorter neck. One of the sherds of this type from Kent Creek has a hole drilled through it.

Unidentified Brown
Sample size: 1

The temper in this sherd consist of 70% rolled sand and 30% mica. Particle sizes range from 0.1 to 0.5 mm. Construction is by coiling and wall thickness is 4.6 mm. Paste and core color is dark brown. The texture is very fine and is friable. Surface finish is rough; treatment is by wiping and smoothing. The sherd is from an olla.

The sand temper in this sherd suggests that it was produced in

the Panhandle-Plains region. Word (1965) reports the occurrence of plain brownwares with predominately sand temper from the Floydada Country Club site in Floyd County, Texas, which were probably produced locally.

Daub
Sample size: 4

Four chunks of daub were recovered from excavations at the Kent Creek site. All of these are from Structure 1. The size of the chunks is such that these are probably plastering from a wall.

FAUNAL ANALYSIS

A total of 627 faunal specimens were recovered from the Kent Creek site including 527 complete and fragmented bones, 18 isolated teeth and teeth fragments, 77 terrestrial gastropods, and numerous bivalve fragments. Of the 527 bones recovered from the site, 471 (89%) are small bone fragments which could not be classified any further than to the subphylum Vertebrata. Identifiable bone includes nine reptile bones and 53 mammal bones, with mammals making up 85% of the identifiable bone. As used here, identifiable refers to those specimens which could be assigned to the taxonomic level of class.

Specimens exhibiting disorders were absent from the sample. Spiral fractures indicative of freshly broken bone containing a high collagen content were observed in two instances. The first specimen consists of the distal end of a left artiodactyl femur represented by either antelope or deer. It was recovered from Stratum 2b in excavation unit N21-22 W2-4. The second specimen is an awl preform

constructed from the lateral portion of a deer metatarsal. This specimen was associated with the burial.

Analysis produced no evidence of cut marks or gnawing. Burned bone constitutes 29.3% (155 specimens) of the bone assemblage. Poor bone preservation is reflected in the fragmentary nature of the sample and the high degree of marked weathering noted. Weathering as it is used here includes all forms of physical and chemical bone reduction. Evidence of weathering is reflected in 91.1% (482 specimens) of the bone sample.

In addition to the vertebrate faunal remains recovered from the site, 77 terrestrial gastropods and numerous mussel shell fragments were also recovered. It should be emphasized that the numbers presented above are in no way a direct reflection of the dietary importance of these animals at the site, or that all of the remains accumulated as a result of human activity. The numbers are presented simply as a means of quantifying the faunal material recovered from the site. The gastropod fragments most likely represent a fortuitous association, as do the snake remains. The small number of identifiable remains in general prevents any broad dietary conclusions.

What follows is a discussion of the faunal material recovered from the site. All material is considered together and no temporal distinctions are made. Table 18 summarizes the Kent Creek faunal assemblage.

Table 18. Number of Identified Faunal Specimens (NISP), Kent Creek Site.

Classification	Stratum/Feature 1	2a	2b	2c	Fea. 7	Fea. 8	NISP
Deer or Antelope			8*	2	2		12
Deer					4		4
Pronghorn Antelope			(1)				(1)
Bison			1				1
Skunk			2				2
Cottontail Rabbit					1		1
Unident. Rabbit			4				4
Prairie Dog				1			1
Unident. Rodent			2	1			3
Hard Shell Turtle			3(3)				3(3)
Water Turtle			1				1
Unident. Snake	2						2
Vertebrate	1(2)	10(1)	213(101)	40(19)	58(15)	6(6)	327(144)
Large Mammal	1	2	7	3	1		14
Medium/Large Mammal		4(1)	10(3)	3(2)	(1)	2	19(7)
Small/Medium Mammal					1		1
Small Mammal			1				1
Gastropods			77				77
Mussel shell	unk.	unk.	unk.	unk.	3	unk.	unk.

*Numbers not in parentheses represent the number of bone elements or fragments found unburned in each unit. Numbers in parentheses represent the number of bone fragments burned in each unit.
Unk. = unknown

Deer (*Odocoileus* sp.)
Sample size: 4

These specimens consists of four metatarsals which have been modified into an awl and three awl preforms. Morphological overlap between *O. virginianus* (white-tailed deer) and *O. hemoinus* (mule deer) makes osteological differentiation between the two difficult. Davis (1978) notes that both species occur in the High Plains, with mule deer preferring more arid, open environments than the white-tailed deer. A minimum of three individuals is represented by the remains.

One of the metatarsals exhibits an unfused condyle, indicating that the individual was a subadult.

Pronghorn Antelope (*Antilocapra americana*)
Sample size: 1

This specimen is the proximal end of a medial phalange. The specimen was recovered near Feature 5 from excavation unit N17-18W4-5, Stratum 2b. The burned condition of the bone suggests that human activities played a role in its taphonomic history. Davis (1978) notes that pronghorns are currently distributed over the western half of Texas from the Panhandle to the Lower Rio Grande Valley, inhabiting a plains environment.

Unidentified Artiodactyls
Sample size: 12

Specimens in this category include a cervical vertebrae, the distal portion of a proximal phalange, the distal end of a right tibia, a right unciform (carpal), an astragalus fragment, two distal metapodial fragments, a left astragalus, a right astragalus, a left scaphoid (carpal), the lateral condyle from the distal end of a left femur, and a tooth fragment.

The bone assigned to this category represents either *Antilocapra americana* (pronghorn antelope) or *Odocoileus* sp. (deer). No positive identification may be made because of the fragmentary nature of the remains. A minimum of two individuals is represented based on the presence of three astragali. The single artiodactyl tooth fragment was recovered from the fill covering the burial. None of the material is burned.

Bison (*Bison bison*)
Sample size: 1

The specimen is a complete proximal phalange. It was recovered in the area of Feature 5 from excavation unit N19-20 W5-6, Stratum 2b and represents the only identifiable bison remains recovered from the site. The bone was identified as bison rather than cow based on the site's temporal setting and the vertical provenience of the specimen. Olsen's (1960) criteria for differentiating between *Bos* and *Bison* on the basis of the first phalanx could not be substantiated. Bison were once found in great herds over much of North America, normally ranging over prairie environments (Davis 1978).

Skunk
Sample size: 2

These specimens are a complete left calcaneus of a subadult and a right premaxilla exhibiting the third incisor, also from a subadult. Age assessment for both specimens were based on their unfused proximal epiphysis. The remains probably represent a single individual. Davis (1978) notes that two genera of skunks currently inhabit Hall County; *Spilogale* (spotted skunks) and *Mephitis* (striped and hooded skunks), preferring tall-grass prairie or wooded area habitats.

Cottontail Rabbit (*Sylvilagus* sp.)
Sample size: 1

This specimen is the proximal articular end and approximately one third of the shaft of a right ulna. The specimen was recovered from the fill of the burial. Genus identification was assessed on the basis of bone gracility as compared with the larger black-tailed

jackrabbit (*Lepus californicus*), which also inhabits the area today (Schmidly 1983). Cottontails that currently inhabit Hall County include desert cottontail (*S. audubonii*) and eastern cottontail (*S. floridanus*) (Davis 1978).

Rabbits and Hares
Sample size: 4

These specimens consists of four individual teeth which include a LPm3 (lower), a LPm4 (lower), a LM2 (lower), and a LM3 (lower). All four teeth were recovered from excavation unit N19-20 W5-6, Stratum 2b and appears to represent the left mandibular dentition of a single individual.

Black-tailed Prairie Dog (*Cynomys ludovicianus*)
Sample size: 1

This specimen is a right mandibular fragment exhibiting tooth sockets for RPm4 (lower) through RM2 (lower). Two teeth, RM1 (lower) and RM2 (lower), are intact. The specimen was recovered near Feature 5 from excavation unit N18-19 W5-6, Stratum 2b.

Prairie dogs are actually ground-dwelling squirrels and are common in the short-grass prairie habitats of western and northern Texas (Schmidly 1983). Davis (1978) notes that their burrows are commonly three to four inches in diameter and may extend down nearly vertically for as much as fourteen feet.

Rodents
Sample size: 3

These materials consists of three isolated incisors recovered from Stratum 2b of excavation units N18-19 W3-4, N18-19 W7-8, and N19-

20 W1-2. Each incisor is indicative of a small rodent.

Hard Shelled Turtle
Sample size: 3

These specimens are three left peripheral carapace plates. While the peripheral carapace plates lack structural features which would allow family assignment, they are representative of the hard shell turtles and not the soft shell turtle family Trionychidae.

Water Turtles (*Chrysemys* sensu lato)
Sample size: 1

This specimen is a left peripheral carapace plate. The use of the taxon *Chrysemys* follows Boulenger's (1889) inclusion of painted turtles, cooters, and sliders within a single genus. Agassiz (1857) had divided the complex into three genera: *Chrysemys* (painted turtles), *Pseudemys* (cooters), and *Trachemys* (sliders). Controversy exists even today, however, concerning which classification system most accurately reflects the relationship of these turtles (Seidel and Smith 1986). Because of the difficulty involved in identifying turtle remains from archaeological sites (Sobolik and Steele n.d.), Boulenger's classification is preferred within this paper.

If the presence of water turtle remains at the site is indeed a result of human activity, Kent Creek (which is spring fed) reflects a potential source of exploitation. This specimen was recovered near Feature 5 from excavation unit N19-20 W5-6, Stratum 2b.

Unidentified Turtle
Sample size: 3

These are three unidentifiable plate fragments. These three

specimens may represent either plastron or carapace fragments. It is not possible to determine if these remains reflect aquatic or terrestrial species. The burned condition of these bones suggests that human activities played a role in their taphonomic history.

Snakes
Sample size: 2

These specimens are both fragmented vertebrae. They were recovered from excavation unit N22-23 WO-1, Stratum 1 and most likely represent one individual. These remains probably represent a recent intrusion based on the slight weathering observed and their vertical position within the site.

Unidentified Vertebrate Fragments
Sample size: 472

This category constitutes 89% of the faunal bone assemblage recovered from the site and consists of bone fragments and a tooth fragment which lack diagnostic features that would allow class assignment. Of the specimens in this category, 144 are burned. Overall, the material represents minute unidentifiable fragments of bone from throughout the site. In several instances, however, it was possible to identify the bone as representing a long bone fragment from a small animal, yet the assessment of class remained uncertain. A possible tooth fragment representing a poikilothermal animal was also included in this category. In all likelihood most of the vertebrate remains are of mammals, though no positive identification can be made.

Unidentified Mammal Fragments
Sample size: 51

Specimens in this category consists of mammal bone fragments and teeth fragments unassignable to order from throughout the site. Mammals within this classification were identified on the basis of the following subcategories: small mammal, small/medium mammal, medium/large mammal, and large mammal. Small mammals are defined as animals the size of most rodents and rabbits. Medium mammals are defined as those animals within the size range of canids. Large mammals are defined as those animals the size of deer and larger. Seven of the medium/large bone fragments are burned.

Gastropods
Sample size: 77

These specimens are terrestrial gastropod fragments recovered from the flotation samples. Family levels identified are Zonotidae (n=68), Pupillidae (n=8), and Endodontidae (n=1). They most likely represent a fortuitous association.

Mussel Shell
Sample size: unknown

Numerous mussel shell fragments were recovered from throughout the site. Most specimens are small fragments which could not be identified as to species.

Worked Shell and Bone

Five worked shell artifacts (Figure 24) were recovered from the site; all from Structure 1. Of these, three are right valves from fresh-water mussels that were recovered from the burial. One of the

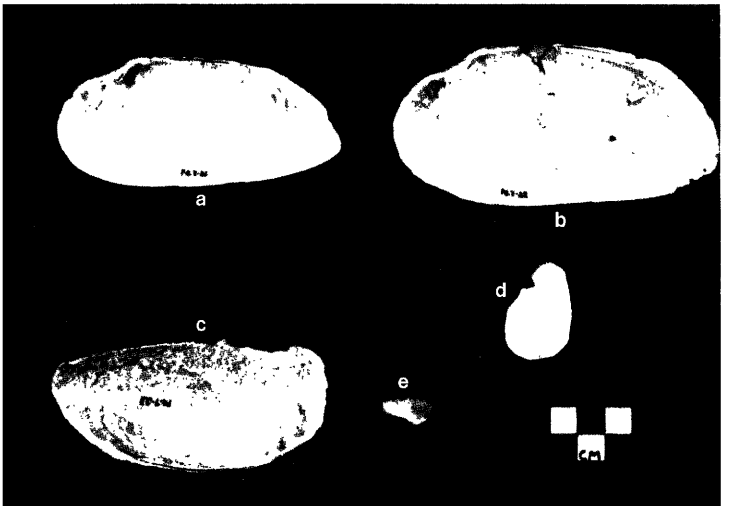

Figure 24. Worked shell recovered from the Kent Creek site: a-c, mussel shells from burial; d, pendant; e, shell fragment with serrated edge.

two smaller valves is slightly ground along the edge and may have been a scraper; the other has a hole drilled near the apex and may be a pendant. The larger valve has two small holes along the lower ventral edge. The remaining two pieces were recovered near the entrance of Structure 1. One is an oval shaped incised piece of mussel shell that may be a pendant. The second is a small fragment of mussel shell with a serrated edge and may have been a scraper.

Four worked bone artifacts were recovered from the burial (Figure 25). These include one bone awl and three awl preforms. Analysis of the artifacts was facilitated through the utilization of Lang and Harris' (1984) bone awl classification system.

The awl (Figure 25d) corresponds to Type D specimens, consisting of a quartered and altered large mammal metapodial, whose proximal end has been retained. The specimen compares favorably with the anterior medial portion of a right deer metatarsal. The tip of the awl is elongated and sharp, exhibiting polishing and wear around the circumference of the bone. The awl measures 20.0 cm in length.

In addition to the finished awl, three awl preforms were recovered, representing the initial stage of bone awl manufacture. The three specimens compare favorably with Type A awl artifacts, as described by Lang and Harris (1984). Type A specimens are produced from large mammal metapodials and are split longitudinally. Such preforms may be produced by scoring the bone along the anterior groove, followed by the insertion of a wedge into the scored surface to facilitate splitting. All four of the awl specimens showed signs of scoring.

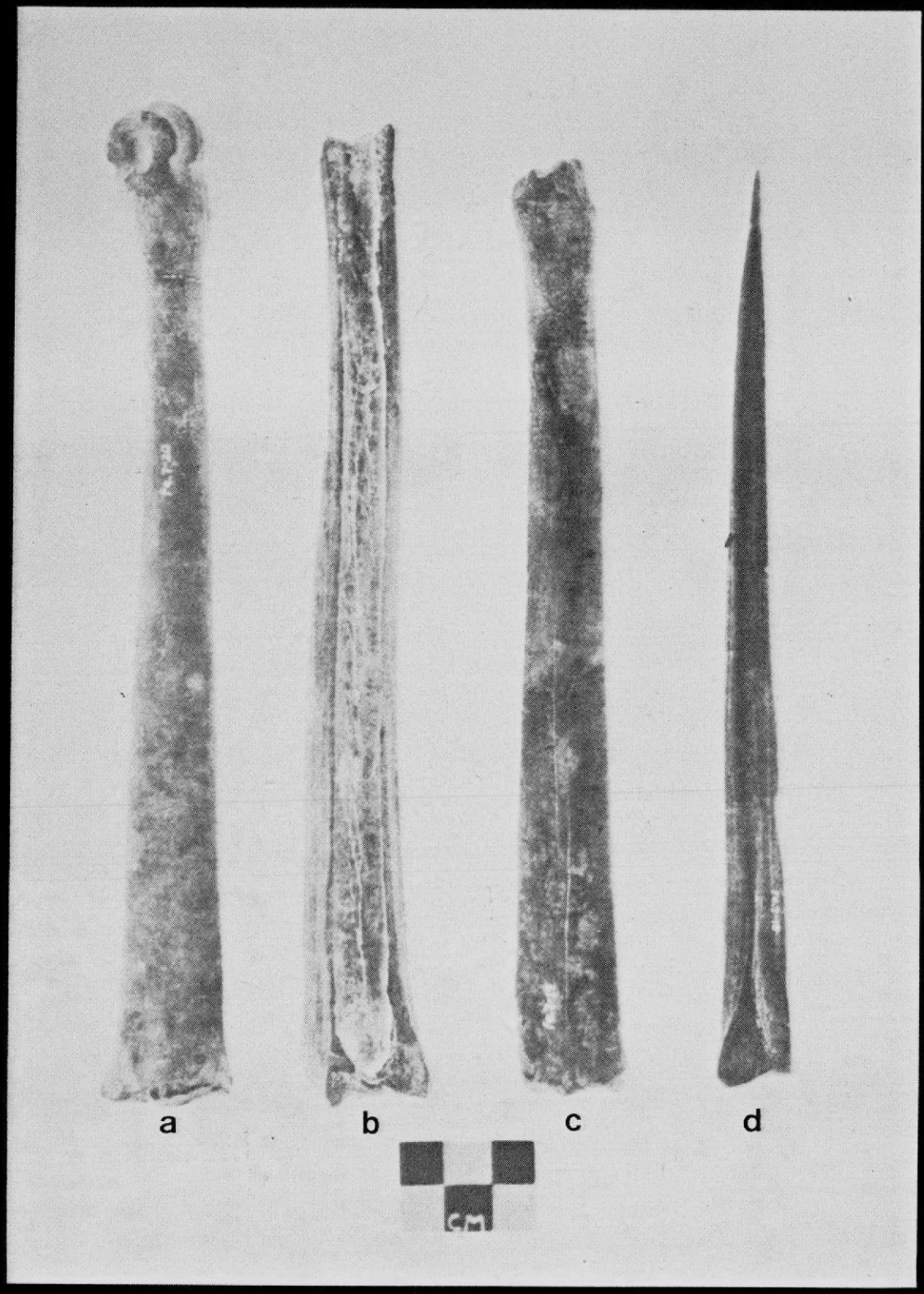

Figure 25. Bone tools recovered from the Kent Creek site: a-c, awl preforms; d, awl.

Of the preform tools, all are from right metatarsals of deer (*Odocoileus* sp.). Examination of the preforms indicated that each is representative of a separate individual. The first specimen (Figure 25c) is the medial portion of a subadult deer metatarsal. This is inferred from the fact that the distal condyle remains unfused. The preform measures 20.4 cm in length and exhibits fine root etching along the distal portion of the bone.

The second preform tool (Figure 25a) is also the medial portion of a metatarsal. The bone measures 21.9 cm in length and possesses fine root etching over the entire surface of the bone. The third specimen (Figure 25b) is the lateral portion of a metatarsal which lacks the distal condyle. Spiral fractures are observable on the distal end of the bone, perhaps a result of tool manufacture activity. The bone measures 21.5 cm in length and exhibits fine line cracking and root etching on its exterior surfaces.

POLLEN AND FLORAL ANALYSIS

In addition to the lithic, ceramic, and faunal assemblages, five pollen samples and four flotation samples were submitted to the Texas A&M University Anthropology Department Palynology Laboratory for analysis.

POLLEN ANALYSIS

The pollen samples submitted were from the floor of Structure 1, the floor of Structure 2, Feature 8 (pit), Feature 5 (hearth), and Feature 10. Unfortunately, no pollen or plant remains from

domesticated plants was recovered from any of the Kent Creek samples. Pollen that was identified includes *Pinus* (pine) which was recovered from all the samples, Poaceae (grass), *Amaranthus* (pigweed), *Chenopodium* (goosefoot), and low-spine Asteraceae which is produced by ragweed and goldenrod. Table 19 provides the pollen counts from the site.

In light of the fact that both pine pollen and grass pollen are produced in great quantities and that pine pollen is known to travel long distances from its source of production, it is felt that the presence of these pollen types in the samples reflects the natural pollen rain rather than necessarily reflecting the paleoenvironment. The Cheno-Am, on the other hand, has a well documented ethnographic usage as a food plant.

PLANT REMAINS

The following plants were recovered from the flotation samples from the site. The distribution of the plant remains by analytic unit is presented on Table 20.

Goosefoot (*Chenopodium*)

Seeds from this plant were recovered from Feature 6 and Feature 10. Goosefoot can be eaten as greens in the spring and early summer. Seeds are available in the late summer and fall (Gilmore 1977; Yarnell 1965). Goosefoot grows in open settings commonly found around habitation sites. Some *Chenopodium* seeds from the eastern U.S. are unusually large and may reflect selective propagation of the species.

Table 19. Pollen Counts from the Kent Creek Site.

Provenience	Pollen Type	Quantity
Structure 1	*Pinus*	1
	Poaceae	1
	Cheno-Am	5
	Onagraceae	1
	Total	8
	Concentration value (grains/ml)	144.64
Structure 2	*Pinus*	2
	Poaceae	1
	Total	3
	Concentration value (grains/ml)	27.67
Feature 5	*Pinus*	1
	Cheno-Am	3
	Low-Spine Asteraceae	1
	Indeterminate	1
	Total	6
	Concentration value (grains/ml)	123.27
Feature 8	*Pinus*	1
	Cheno-Am	6
	Low-Spine Asteraceae	1
	Total	8
	Concentration value (grains/ml)	136.45
Feature 10	*Pinus*	3
	Poaceae	1
	Cheno-Am	12
	Total	16
	Concentration value (grains/ml)	289.28

Most of the seeds recovered from the Kent Creek site appear to represent wild forms, however, one of the seeds was observed to be unusually larger than the others.

Purslane (*Portulaca*)

Seeds from this plant were recovered from Feature 10. Purslane

Table 20. Distribution of Plant Remains, Kent Creek Site.

Plant	Fea. 5	Fea. 6	Fea. 7	Fea. 10	Fea. 12
Goosefoot		X		X	
Purslane				X	
Oak			X	X	X
Juniper	X				
Cottonwood/ Willow		X			

can be eaten as a green during the spring, whereas its seeds are available from May through late fall. Purslane favors open and/or secondary growth settings such as those present around habitation sites.

Oak (*Quercus* sp.)

Fragments of charred acorns were recovered from the fill of the burial and from Feature 12 inside Structure 2. Although the species could not be ascertained, a number of oaks can be used as a food source. Acorns from the shin oak (*Quercus havardii*) are abundant in the Rolling Plains region of Texas during favorable years and were potentially an important food resource. Acorns could also be used in the preparation of tannic acid for hide preparation or as a source of fuel for fires. Acorns are available during the fall.

Juniper (*Juniperus*)

A fragment of charred juniper wood was recovered from Feature 5. Juniper is common in this section of the Rolling Plains and was probably used as a source of fuel for fires.

Cottonwood or Willow (Salicaceae family)

This charcoal fragment was recovered from Feature 6. It could not be identified beyond the family level of Salicaceae. It appears to be either cottonwood or willow, both of which are abundant along Kent Creek.

CHAPTER VII

SYNTHESIS OF THE DATA AND CONCLUSIONS

In Chapter IV several research questions were posed which, it was hoped, could be answered by the analysis of the data gathered from the site. Briefly stated, these questions are: 1) What is the age of the Kent Creek site occupation? 2) How do the structures at Kent Creek compare to Mogollon and Plains structures? 3) Do the recovered materials indicate an occupation of the site by a cultural group indigenous to the region? 4) What do the artifacts and artifact distributions reveal about activities and activity areas at the site? 5) What were the subsistence strategies at the site? and 6) What can be said about influence from the Mogollon or Plains Woodland on the developing cultures of the Southern Plains? Below, under the headings of chronology, architecture, artifacts, activity functions, subsistence, and conclusions, the data gathered from the site is summarized and the research questions addressed.

CHRONOLOGY

Three radiocarbon dates were obtained from charcoal samples at Kent Creek. Two of the dates were from Feature 5 (hearth) and the third was from the floor of Structure 1. The dates from Feature 5 were A.D. 1110±250 and A.D. 790±80. The date obtained from Structure 1 was A.D. 710±120. Following the procedures outlined by Ward and Wilson (1978), these dates were combined to produce a date of A.D. 802±108. When converted to their calendrical equivalents (Stuiver and Pearson 1986), the dates range from A.D. 690-1010 with a mid-range of A.D. 889.

Additional observations on the temporal placement of the Kent Creek site can be presented through a review of the artifact assemblage. Both dart points (n=12) and arrow points (n=56) were recovered from the site. As discussed in more detail later, the dart points appear to represent either a continued use or re-use of these items and are, therefore, not considered here.

The arrowpoints recovered include Scallorn and Deadman types. Both of these types apparently have long temporal ranges. Turner and Hester (1985:189) date the Scallorn point from ca. A.D. 700-1200, though at the Deadman's Shelter site of the Palo Duro phase, Hughes and Willey (1978) recovered Scallorn-like points from contexts with radiocarbon dates of A.D 120±60 and A.D. 210±40. The Scallorn point is considered the characteristic type of the Woodland period (ca. A.D. 200-800) in the Southern Plains and is also the predominant type of

the early Plains Village Custer phase (A.D. 800-1200) in western Oklahoma (Lintz 1976; Hofman 1978; 1984). The Deadman point has thus far been reported only from sites of the Palo Duro phase which dates from ca. A.D. 200-1000 (Hughes n.d.; Wedel 1975; Hughes and Willey 1978; Etchieson 1979).

Like the arrowpoints, the ceramics provide a rather broad temporal range for the occupation of the Kent Creek site. All of the ceramics (n=34) are plain brownwares. Thirty are Mogollon Brownwares from the Middle Pecos Valley of New Mexico, three appear to be from the Tularosa Basin of southern New Mexico, and one sherd is apparently of local manufacture. The Mogollon ceramic types represented include Jornada Brown (n=16), Roswell Brown (n=11), and Middle Pecos Micaceous Brown (n=6). In the Middle Pecos Valley, Jelinek (1967) found that these types dominate the ceramic assemblages from ca. A.D. 800 to 1100.

In sum, the projectile points from the site provide only a broad temporal range (ca. A.D. 200-1100) for the occupation at the Kent Creek site. The ceramics narrow this range considerably and suggest a range from ca. A.D. 800-1100. The radiocarbon dates from the site range from ca. A.D. 690-1010. Further refinement of the Kent Creek site chronology will require additional excavation and analysis.

ARCHITECTURE

The two excavated structures at the Kent Creek site, while sharing a number of architectural features, are quite dissimilar in

construction plans and architectural design. Both of the structures are shallow (less than 35 cm bgs), both are rectangular in shape, and both have extended ramp entryways. Conversely, Structure 1 has almost twice the floor area of Structure 2 (14.2 square meters compared to 7.6 square meters). In addition, several posts molds were located inside Structure 1 whereas none were located inside Structure 2. Several pieces of daub were also recovered from Structure 1, perhaps suggesting a wattle and daub superstructure. Daub was not recovered from Structure 2 but this structure did contain a number of small cobbles (some with plaster on one side) as well as several patches of mixed clay and gravel. These materials apparently were used in wall and roof construction, perhaps as "chinking." This suggests that Structure 2 may have had a jacal superstructure. Structure 2 also had a plastered floor whereas Structure 1 did not. Finally, several artifacts and features (including a burial and a rock-lined hearth) were located inside Structure 1 whereas in Structure 2 only two trough-like features and one mano were located.

The architectural differences exhibited by the structures at Kent Creek suggest that they were utilized for different purposes. The larger size of Structure 1 and the presence of several features and artifacts indicates that this structure was utilized as a habitation. The function of Structure 2, on the other hand, is not readily apparent. This structure, being significantly smaller than Structure 1 and lacking features and artifacts, may have served as a storage facility. No direct evidence for this interpretation exists, however.

COMPARISON WITH MOGOLLON AND PLAINS STRUCTURES

Determining how the structures at Kent Creek compare to structures of the Mogollon, Plains Woodland, and early Plains Village complexes is important in order to determine the sources of cultural influence on the Southern Plains during the first millenium A.D. Unfortunately, no Plains Woodland structures have yet been investigated in Texas or in western Oklahoma. A few Plains Woodland structures have been investigated in the Central Plains but details on construction are lacking. In general, most of these structures appear to be circular, shallow basin-shaped depressions with a few randomly placed poles for roof and wall supports which were then covered by grass or thatch, apparently in an eastern Woodlands fashion (Wedel 1961). Overall, they show few similarities to the Kent Creek structures.

In comparing the structures at Kent Creek with those of early Plains Village cultures, only general architectural similarities are evident. Most early Plains Village structures are rectangular in shape and commonly they are semisubterranean, like the structures at Kent Creek. Other than these general similarities, however, no other specific similarities exist. For example, the most distinguishing feature of the structures at Kent Creek are the extended ramp entryways. Though extended entryways are common features on some of the early Plains Village structures (Wedel 1961; Lintz 1986), none of the entrances are inclined ramps like those at Kent Creek.

Furthermore, the floor sizes of the structures at Kent Creek are quite small when compared to those of early Plains Village structures.

As mentioned above, Structure 1 at Kent Creek has a floor area of 14.2 square meters and Structure 2 has a floor area of 7.6 square meters. Early Plains Village structures tend to be significantly larger, averaging between 20 and 40 square meters (Hofman 1984; Lintz 1986).

Another characteristic of Plains Village architecture which is lacking at Kent Creek is the use of four central roof support posts. Structure 1 at Kent Creek has a single larger post near the center of the structure and smaller periphery posts near the walls. Other characteristics of the early Plains Village structures located in the Panhandle include the use of slab-lined foundations, depressed floor channels, raised platforms or altar features, and threshold collar features (Lintz 1986). None of these characteristics were found at Kent Creek.

Obversely, the structures at Kent Creek show strong similarities to semisubterranean structures found in the Mogollon region of the Southwest. The ramp entryways found at Kent Creek are a distinguishing characteristic of Mogollon architecture. Feature 3 at Kent Creek appears to be a step which separates the ramp from the floor. This type of feature is common in Mogollon pithouses (Wheat 1955). The floor area of the structures at Kent Creek also compare favorably with Mogollon structures. According to Wheat (1955) and Anyon *et al.* (1981), Mogollon pithouses generally average between 13 and 15 square meters. Though Structure 2 at Kent Creek is significantly smaller than the average Mogollon pithouse, this structure is believed to be a storage facility and not a habitaton. Also, the use of a larger central roof support post is common in

Mogollon structures. Finally, though not an architectural feature *per se*, the burial at Kent Creek was placed in a subfloor pit in Structure 1. This practice is fairly common in the Southwest but is rare in the early Plains Village cultures (Wheat 1955; Lintz 1986).

Architectural features which seem to be unique to Kent Creek are the two trough features (Features 12 and 13) located in Structure 2. The function of these features is not known and no similar features have been located in the literature for sites in the Southwest or the Plains.

Though more detailed information (such as roof and wall construction and covering techniques) which could be used in comparative analyses is lacking at Kent Creek, it seems clear that the structures compare favorably with Mogollon structures while few similarities with Plains structures are evident.

ARTIFACTS

The Kent Creek artifact assemblage exhibits a wide variety of tool forms and, as such, a varied array of activities were apparently being conducted at the site. Tools collected at Kent Creek include arrow and dart points, arrowpoint preforms, knives, drills, choppers, cores, scrapers, spokeshaves, gouges, modified flakes, grinding implements, hammers, ceramics, and bone awls. In addition, numerous lithic and bone debris items were recovered.

Several points concerning the characteristics of the lithic assemblage are apparent. First, the lithic materials represented in the debitage and tool assemblage indicate a heavy reliance upon the

use of local materials for the production of lithic tools. Locally available materials, which include Tecovas jasper, sandstone, quartzite, Potter chert, petrified wood, and opaline, account for almost 98% of the lithic resources utilized. This suggests that the Kent Creek occupants were indigenous to the region and were relying almost exclusively on locally available materials.

However, the presence of some nonlocal cherts and obsidian indicate contact or trade to the north, south, and west. Table 21 presents the distance and compass direction of the source areas for the lithic materials recovered from the Kent Creek site. As can be seen on Table 21, the presence of Alibates agate (from the Canadian River region) suggests trade networks or travel to the north. Edwards chert, found on the extreme southeastern edge of the High Plains, suggests contact to the south. Interaction with groups to the west is suggested by the presence of Dakota quartzite and obsidian.

Table 21. Distance and Direction of Lithic Source Areas.

Material	Distance to Source (miles)	Direction
Alibates agate	100	NNW
Dakota quartzite	150	WNW
Edwards chert	25	SSW
Obsidian	340	WNW
Opaline	local	--
Petrified wood	local	--
Potter chert	local	--
Quartzite	local	--
Sandstone	local	--
Tecovas jasper	local	--
Unidentified	local	--

The second point to be made concerning the lithic artifacts from Kent Creek focuses on the styles of knives and scrapers recovered. Unlike the large four-beveled knives characteristic of the Plains Village complexes to the north and east, the knives at Kent Creek (and the Palo Duro phase as a whole) are small and ovoid. Likewise, scrapers of the Palo Duro phase are small and light and usually of the side scraper or flake scraper varieties, often being not much more than large retouched flakes. The scrapers of the preceding Archaic complexes and of the later Plains Village complexes of the region, however, are characteristically large and the bit is steeply angled.

Both of these cultural complexes were apparently heavily dependent on the bison populations (Hughes n.d.; Lintz 1986). This difference in hide working tool types may suggest less of a reliance on bison during the Palo Duro phase and more of a reliance on deer and smaller mammals. This suggestion is supported by the analysis of the faunal remains from Kent Creek and from other sites in the region that date to this time period (Dillehay 1974; Hughes and Willey 1978). This point is discussed in more detail below with the subsistence discussion.

Third, the presence of both dart points and arrowpoints may suggest either a multiple occupation of the site or a continued use of dart points by groups of the Palo Duro phase. That the dart points are the result of a multiple occupation does not seem likely because none of the dart points were recovered from the deepest cultural stratum (Stratum 2c). In fact, two of the dart points were recovered from Stratum 2a and five from Stratum 2b with the remaining five being

collected from the surface of the cultivated field. Both arrowpoints and ceramics were recovered from Stratum 2c in undisturbed contexts and this would suggest a continued use of the dart points rather than a multiple occupation.

To date, dart points have been reported from every Palo Duro phase site investigated. Hughes (n.d.) has suggested that the arrowpoints of the Palo Duro phase are merely scaled-down versions of the dart points of the region. If so, this would seem to support a conclusion that the indigenous Archaic groups of the Southern Plains were the base from which the subsequent Palo Duro phase emerged.

The vertical distribution of the flake and debitage items (Table 22) also suggest a single occupation for the site. Of the 12,147 lithic items recovered from non-feature proveniences, 660 (5.5%) were recovered from Stratum 1, 2440 (20.0%) from Stratum 2a, 8288 (68.2%) from Stratum 2b, and 759 (6.2%) from Stratum 2c. This analysis clearly reveals that the vertical distribution of materials "peaks" in Stratum 2b, which suggests either a single occupation of the site or a frequent re-occupation of the site.

Finally, except for the ceramics, the Kent Creek artifact assemblage appears to be more similar to Plains Woodland assemblages than to Mogollon, perhaps reflecting adaptation to a Plains environment. The dominate point types at Kent Creek are the Scallorn and Deadman arrowpoints. As pointed out earlier, the Scallorn type, which is found throughout the Southern Plains, is considered indicative of the Southern Plains Woodland stage (Lintz 1976). It is also found in the early Plains Village Custer phase in western

Table 22. Vertical Distribution of Flake and Debitage Items, Kent Creek Site.

Flake Type	Stratum 1		2a		2b		2c		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Primary	22	0.2	76	0.7	262	2.2	14	0.1	374	3.2
Secondary	270	2.2	872	7.2	2380	19.6	212	1.7	3734	30.7
Tertiary	44	0.4	418	3.4	966	7.9	59	0.5	1487	12.2
Debris	324	2.7	1074	8.8	4680	38.5	474	3.9	6552	53.9
Total	660	5.5	2440	20.1	8288	68.2	759	6.2	12,147	100.0

Oklahoma. The Deadman type has thus far been found only on the Southern Plains associated with Palo Duro phase sites and, occasionally, Woodland sites. Other tools recovered at Kent Creek and considered to be of Plains origin are the T-shaped drill, end scrapers, and gouges (Bronitsky 1982; Lintz 1986; Hughes n.d.). The oval knives and small scrapers are also common in Plains Woodland assemblages.

In addition to the chipped stone tool assemblage, the ground stone assemblage at Kent Creek is also more similar to Plains Woodland than to Mogollon. Most of the manos at Kent Creek are oval one-hand types as are those which have been recovered at Southern Plains Woodland sites (Hughes n.d.; 1962). The metates apparently are all small slabs, again like the Plains Woodland types.

What distinguishes Mogollon grinding assemblages is the sheer variety of forms. Wheat (1955:115-116) recognizes no less than four types of manos with rectangular shapes being the most common. Metates consist of slab, basin, trough, and through-trough forms. Wheat

considers the one-end-closed trough metate as the typical Mogollon form. None of these types are represented at Kent Creek and the large trough metates do not appear in Plains Village sites until corn becomes an important dietary supplement (ca. A.D. 1100-1500).

The ceramics from Kent Creek, on the other hand, are clearly of Mogollon origin. Excluding the sand tempered sherd which appears to be of local manufacture, all of the other ceramics from the site are tempered with materials characteristic of ceramics from the Pecos River area of New Mexico and westward to the Tularosa Basin. The tempering materials include feldspar, which is the dominant tempering agent in the assemblage, hematite, magnetite, quartz and quartz sand, mica, and anhydrite or gypsum. The closest source area for most of these materials is the Middle Pecos River valley. Though most of the sherds seem to have originated in the Middle Pecos region, three of the Jornada Brown sherds contain 5-20% magnetite and appear to be from the mountains of the Tularosa Basin, around the Lincoln and Glencoe, New Mexico area.

So few sherds of Mogollon Brownware have been recovered from any Palo Duro phase site (the most being 47 from the Blue Clay site [Hughes and Willey 1978]) that they clearly represent introduced items from the Southwest.

ACTIVITY FUNCTIONS

On the basis of the artifacts and debris, several statements can be made concerning the economical and technological activities conducted at the site. Various tools and remains suggest that hunting

and gathering were the major activities practiced in and adjacent to the site.

Evidence of hunting activities is suggested by the presence of projectile points and animal bone refuse. The local processing of the animal resources is implied from the fragmentary nature of the bone and the presence of lithic tools (scraper, knives) assumed to have been used in such activites. Evidence for gathering activities of wild food remains exists in the floral remains recovered and the presence of the manos and metates. The presence of burned bone, hearths, pits, and a limited amount of ceramics suggests indirectly that food processing occurred on the site. Evidence for local pottery manufacturing is inconclusive, since only one sherd appears to be of local manufacture.

A number of lithic tool categories and debris suggest the presence of manufacturing and maintenance activites. The large quantity of lithic debitage representing all stages of lithic reduction suggests that the majority of stone tools were manufactured at the site from raw or prepared nodules.

Some tool categories suggest the local production of perishable materials, perhaps including cloth, hides, and bone or wooden tools. Clothing preparation or hide working is suggested by the presence of knives, stone and shell scrapers, and bone awls. Local bone or woodworking is directly inferred from the presence of gouges and spokeshaves.

ARTIFACT DISTRIBUTIONS AND ACTIVITY AREAS

Artifact distributions presented in Figures 26 and 27 provide further insights on the nature of the activities conducted at the site and the location of specific activity areas. On the floor in the southwest corner of Structure 1 is a circular distribution of projectile points, cores, a hammerstone, a preform, and lithic debitage. This concentration suggests an area of lithic implement manufacture and maintenance. Near Feature 9 is a concentration of sherds which may indicate utilization of this area for food storage and preparation.

Several activities appear to be associated with Feature 5 (hearth). The flake and debitage distribution shown on Figure 28 and the bone distribution shown on Figure 29, reveals that Feature 5 was a major activity area for tool manufacturing and maintenance and food processing. Several manos around Feature 5 also suggest a food processing activity area. A hide processing area is indicated east of Feature 5 where several scrapers were recovered.

Another hide processing area is indicated east of Feature 10. Feature 11 is a cache of manos with a metate located nearby and is probably another area for processing food. Food processing also seems to be associated with Feature 1 (hearth) where several manos and a metate fragment were recovered. Several lithic tools occur west of Feature 1 which may indicate a lithic tool maintenance or manufacturing area.

Of interest is the distribution of sherds identified as being from ollas (n=6). Of these, two were recovered near Feature 5, two

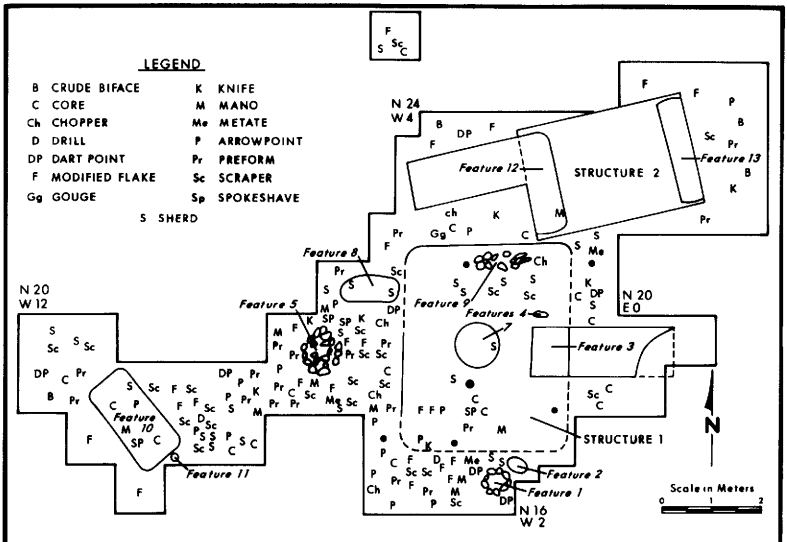

Figure 26. Distribution of tools at the Kent Creek site.

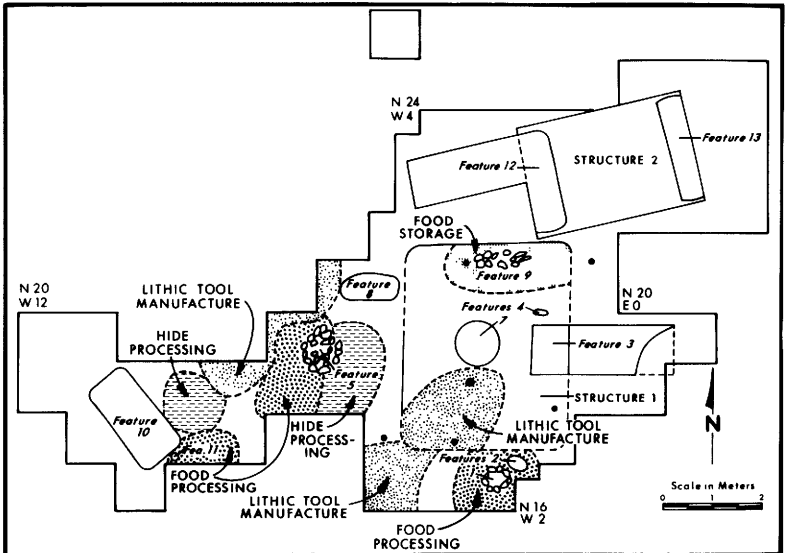

Figure 27. Activity areas at the Kent Creek site.

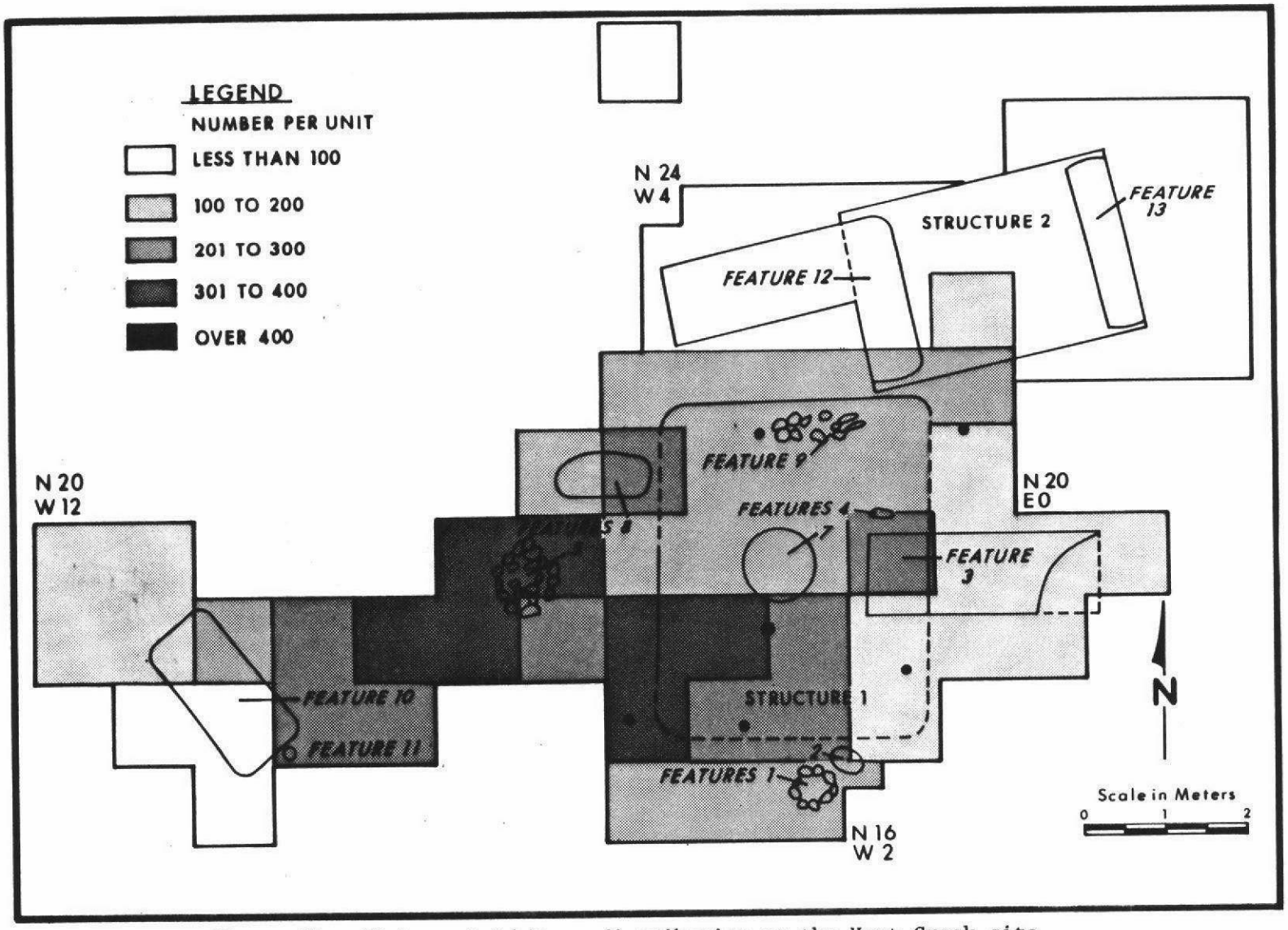

Figure 28. Flake and debitage distribution at the Kent Creek site.

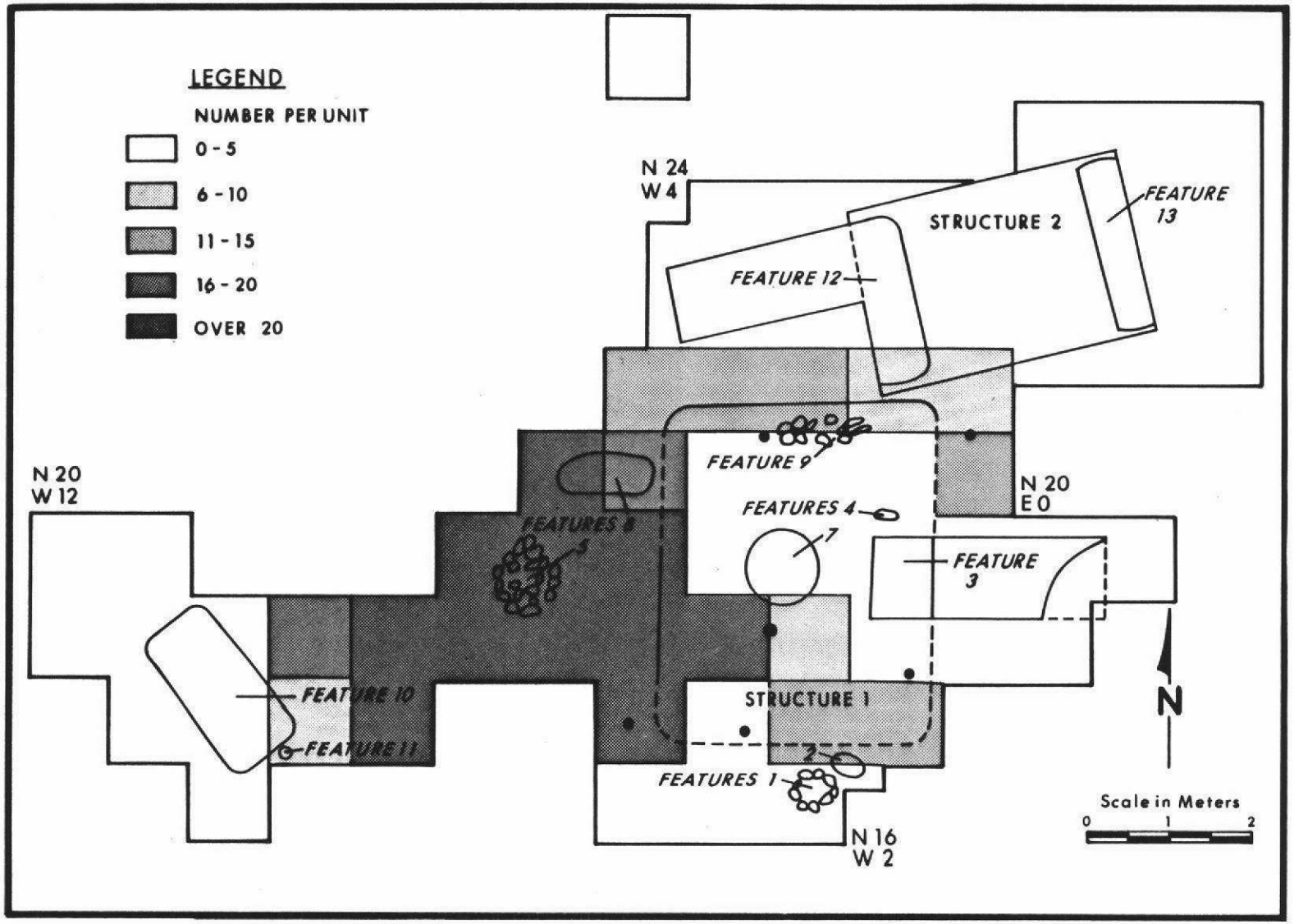

Figure 29. Bone distribution at the Kent Creek site.

were recovered in Structure 1 near the concentration of sherds mentioned above, one was recovered near Feature 1, and the other was recovered near Feature 11. The distribution and frequency of olla sherds suggest that ollas were a primary vessel type at Kent Creek and that they were used in food preparation and storage.

In general, then, the artifact assemblage indicates that the occupants of the Kent Creek site were indigenous to the region and that they had contact and possible trade relations with Mogollon and Plains Woodland groups. The artifact assemblage also suggests that a wide range of activities were being conducted at the site. These activities include tool manufacture and maintenance, hide and meat processing, hunting, plant processing and storing, woodworking, and house construction.

SUBSISTENCE

Animal and plant remains recovered from the Kent Creek site indicate that hunting and gathering were the major subsistence practices. No direct evidence of horticultural activities was recovered. However, because the excavations at the site focused primarily on the structures and because the flotation and pollen analyses were quite limited, the possibility that horticulture was practiced cannot be ruled out.

ANIMAL RESOURCES

As documented in Table 17, hunting activities of the Kent Creek site inhabitants resulted in the procurement of a diversity of animal

species. Unfortunately, most of the faunal assemblage consists of small bone fragments that could not be classified any further than to the subphylum Vertebrata. As such, any broad dietary conclusions are prevented.

The identifiable elements include deer, antelope, bison, skunk, rabbit, prairie dog, turtle, unidentified rodents, and mussel. Most of these were probably obtained near the site with the major emphasis on the floodplain forest and secondary reliance on the upland prairie habitat. Except for mussels, the artiodactyls (deer and antelope) dominate the assemblage.

Of interest is the near absence of bison remains at the site. Only one bison phalange was recovered. Several researchers (Hughes n.d.; Hughes and Willey 1978; Dillehay 1974) have noted the scarcity of bison remains from sites in the region during the time period from ca. A.D. 500 to 1200, lending some credence to Dillehay's (1974) postulated Bison Absence Period II. Though the validity of Dillehay's model has recently been questioned (S. Baugh 1986), it is clear that bison remains, though not completely absent, are minimally represented at a number of sites in the region during this time period.

Paleoenvironmental and faunal studies have shown that this bison "scarcity" occurs at a time when the region may have been experiencing a somewhat wetter and cooler climate. Paleoenvironmental studies in western Oklahoma (Ferring 1982; Lintz and Hall 1983) and in north central Oklahoma (Farley and Keyser 1979; Henry *et al.* 1979) have documented a moist period between ca. A.D. 1-1200 which was followed by a drier period. In addition, detailed faunal analysis from a

series of archaeological sites has suggested that a seemingly moist regime (reflected by prairie vole remains) was followed by somewhat drier conditions (Duffield 1970; Hall 1982; Hughes 1979b).

Ferring (1986), in his geoarchaeological study of Delaware Canyon in southwestern Oklahoma, has documented a significant increase in moisture availability during the Plains Woodland period. This increase in moisture, according to Ferring, led to a western expanse of the forest habitats at the expense of the grasslands with corresponding increases in vertebrate forest species such as white-tailed deer and cottontail rabbits and decreases in available prairie vertebrates, in particular bison. The wetter conditions also led to increased abundance of available plant resources. After about A.D. 1000, moisture availability was apparently reduced and a prairie habitat was again dominate with a corresponding increase in prairie vertebrates.

Ferring's (1986) examination of archaeological sites at Delaware Canyon indicates that, perhaps due to the increased natural resources availability, Plains Woodland occupations were intense, in contrast to more frequent but less intensive occupations during the later Plains Village period. The increased intensity of utilization of the Delaware Canyon area, especially towards the end of the first millennium A.D., corresponds with the appearance of the first Custer phase hamlets in the nearby Washita River Valley (Lintz 1974; Hofman 1975). Ferring (1986) suggests that environmental conditions at this time were favorable under which a shift to a hamlet-based settlement pattern was accomplished. In his words, "the onset of moister

climatic regimes towards the end of the first millennium A.D. seems to have potentially increased resource bases to the point that semisedentism accompanied by horticultural activities was feasible" (Ferring 1986:76). He is quick to add that the archaeological record provides multiple examples that horticulture is not necessarily the result of nor the cause for sedentism.

Nevertheless, this shift in settlement patterns and the transition to the use of domesticates during the early Plains Village period represents a change that perhaps was not feasible during the earlier portions of the Woodland period in the region. As Ferring (1986:76) states, "the increased security of food income from natural resources may have been, in fact, a necessary prelude to the adoption and systematic use of domesticates."

Some detail has been given here to Ferring's (1986) study because of its implications for the cultural development in the southeastern region of the Southern Plains during the Plains Woodland and early Plains Village periods. The scarcity of bison remains from Plains Woodland and Palo Duro phase sites in Texas is probably related to an increase in moisture availability during the first millennium A.D. Increased moisture allowed forest habitats to dominate the region at the expense of prairie and grassland habitats. The result was an increase in available woodland species such as deer and rabbits and a decrease in prairie species such as bison. The accompanying increase in natural resources may have been an important factor in the adoption of horticulture and semisedentism.

PLANT RESOURCES

Nine different wild plant species (and/or genera) were identified in pollen and flotation samples from the Kent Creek site. However, because of limited sampling (only four small flotation samples were analyzed), these plants should not be viewed as the total range of species available to the prehistoric occupants of the site. More extensive flotation analysis would undoubtedly reveal a wider range of plant species utilization.

Of the plants identified at Kent Creek, pigweed (*Amaranthus*), goosefoot (*Chenopodium*), purslane (*Portulaca*), and acorns (*Quercus*) were probably used as supplements to the food supply (Yanovsky 1936; Yarnell 1978). These plants probably grew in open areas adjacent to the site. The plants were primarily gathered from late spring/early summer through late fall.

The other plants identified were either incidental additions to the deposits (pine and grass pollen) or were used for non-food purposes. The trees identified (willow or cottonwood, juniper, and oak) from the charcoal fragments were probably used as a fuel source for fires.

CONCLUSIONS

Archaeological excavations conducted during 1985 and 1986 at the Kent Creek site (41HL66) have provided information on early Plains Village adaptations in the Texas panhandle. The site has produced the first evidence of structures to be associated with the Palo Duro

phase, suggesting that by A.D. 700-800 a transition in settlement patterns and sociocultural organization may have been developing on the Southern Plains with an increase in sedentism and a development of small villages.

Evidence gathered from the faunal and floral analyses suggest that the site was occupied from early spring through late fall. Subsistence was based primarily on hunting and gathering. Though direct evidence of horticulture has not been found, the permanence implied by the structures and the fact that Structure 2 appears to be a storage unit may suggest horticultural practices. However, much more research into the subsistence strategies of the Palo Duro phase is needed before the importance of horticulture can be determined.

The Kent Creek occupants were apparently indigenous to the Panhandle Plains region where they probably developed from the local Archaic manifestations. It is apparent that these early Southern Plains villagers were in contact with groups from the Southwest and also with groups in western Oklahoma and the northern Texas panhandle. By at least the eighth or ninth centuries A.D., they were being significantly influenced by southwestern Mogollon groups; an important factor in determining intraregional trade and exchange networks between the Southwest and the Plains.

This contact apparently intensified after ca. A.D. 1000 when numerous sites on the Llano Estacado that date to this time period are reported where Plains artifacts are in association with Southwestern ceramics. Several hypotheses have been postulated to account for the

occurrence of these sites. These include: 1) the sites represent occupations by Plains peoples who had trade relations with the eastern Pueblos (Pearce 1936, Watts 1963); 2) the sites are the result of brief, intermittent Puebloan occupations (Pearce 1936, Moorehead 1931); 3) the sites represent relatively permanent Puebloan occupations (Witte 1947, Krieger 1946); or 4) the sites are semi-permanent settlements of Puebloan groups which depended upon hunting and gathering with the apparent exclusion of agriculture (Collins 1971).

None of these hypotheses, however, are completely satisfactory to explain the material and structural remains at Kent Creek. Undoubtedly the occupants of Kent Creek had trade relations with Southwestern groups, as evidenced by the presence of Mogollon brownwares and obsidian. The adoption of a similar architectural style, however, indicates more than an occasional trading episode. Direct contact and intermingling of people seems more likely.

The structural and material remains do not support the hypothesis of a brief occupation by a group from the Southwest. Rather, the structures indicate a relatively permanent or semipermanent occupation and the artifact assemblage appears to be of Plains rather than Southwest derivation, with the adoption of Southwestern ceramics.

The hypothesis that natural resources were adequate to support semipermanent settlements which depended upon hunting and gathering but excluded agriculture is certainly a possibility. This hypothesis was advanced by Collins (1971) following the investigations at the Salt Cedar site (A.D. 1000-1500) in Andrews County, Texas which

produced shallow pit houses or jacal-type surface houses, apparently very similar to those at Kent Creek. Like Kent Creek, the Salt Cedar site failed to produce evidence of domestic plants. The faunal assemblage at Salt Cedar, however, was heavily dominated by bison remains while bison at Kent Creek were only minimally represented, with deer and smaller mammals occurring much more frequently.

The scarcity of bison remains at Kent Creek suggest that bison were not an important resource. However, as discussed earlier, other natural resources were probably more abundant during the time period that Kent Creek was occupied and perhaps less abundant when the Salt Cedar site was occupied. This relative abundance and dependence on natural resources may have led to a more semisedentary lifestyle which in turn may have led to the adoption and use of domesticates. Much more data is needed, however, before the importance of horticulture during the Palo Duro phase can be determined.

At any rate, the structural and material remains at Kent Creek indicate that the site was occupied at least semipermanantly and that this occupation was possible as a result of several factors. These factors include heavy reliance on natural resources other than bison, possibly some horticulture, and trade and contact with the Southwest.

Based on the excavations at Kent Creek and other sites of the Palo Duro phase, it is clear that the indigenous groups on the southern portion of the Panhandle Plains were being influenced by Mogollon groups to the southwest during the first millennium A.D. But at this time, information about the environmental conditions and

cultural developments in the Southern Plains and adjacent areas during this time period is insufficient to indicate why this influence occurred.

Further research is needed before the significance of this influence can be determined. Intensive efforts should be made to locate additional village sites of the Palo Duro phase. At present, only one other site has been located which may contain structures (Hays 1986), but this site has not been extensively investigated. All of the other known sites of the Palo Duro phase appear to be either open camps or rockshelters.

Once additional village sites are located future investigations should address the following research questions:

(1) What is the nature of the layout of village patterns and are these patterns similar to those of the Mogollon?

(2) Was the natural flora, such as acorns, sufficient to support an increase in sedentism at the same time there was a scarcity of bison, or were horticultural practices adopted?

(3) Was there a local brownware ceramic tradition on the Southern Plains and, if so, how similar are these ceramics to the plain wares of the Custer phase villagers of western Oklahoma?

Answers to these questions are critical before we can begin to understand the nature of the cultural exchanges that occurred between the Southwest and the Plains during the early centuries A.D. and other sites like Kent Creek must be investigated in order to provide these answers.

REFERENCES

Agassiz, L.
1857 Contributions to the natural history of the United States of America, first Monograph. In North American Testudinata. Vol. 1, part 2 Little, Brown and Company, Boston.

Anyon, Roger
1980 The Late Pithouse Period. In An archaeological synthesis of southcentral and southwestern New Mexico, edited by Steven A. LeBlanc and Michael E. Whalen. Office of Contract Archaeology, University of New Mexico. pp. 142-204.

Anyon, Roger, Patricia Gilman, and Steven A. LeBlanc
1981 A reevaluation of the Mogollon-Mimbres archaeological sequence The Kiva 46(4):209-225.

Anyon, Roger and Steven A. LeBlanc
1984 The Galaz ruin: a prehistoric Mimbres village in southwestern New Mexico. The Maxwell Museum of Anthropology and the University of New Mexico Press, Albuquerque.

Bagot, Joe T. and Jack T. Hughes
1979 Archaeological Inventory of Caprock Canyons State Park. Archaeological Research Lab, Killgore Research Center, West Texas State University, Canyon, Texas.

Baugh, Susan T.
1986 Late prehistoric bison distributions in Oklahoma. Plains Anthropologist 31(114, Part 2):83-96. Memoir 21.

Baugh, Timothy G.
1986 Culture history and protohistoric societies in the Southern Plains. Plains Anthropologist 31(114, Part 2):167-187. Memoir 21.

Baugh, Timothy G.(ed.), Susan M. Berta, Peggy Flynn, John A. Harrington, and Michael C. Moore
1984 Archaeology of the Mixed Grass Prairie Phase I: Quartermaster Creek. Oklahoma Archaeological Survey, Archeological Resource Survey Report No. 20.

Blair, W. Frank
1950 The biotic provinces of Texas. The Texas Journal of Science 2(1):93-117.

Blakley, Earl R.
1967 Soil survey of Hall County, Texas. United States Department of Agriculture.

Boisvert, R. A.
1980 Materials recovered. In Excavations at four Archaic sites in the lower Ohio Valley Jefferson County, Kentucky, edited by M. B. Collins. Department of Anthropology, University of Kentucky, Occasional Papers No. 1:60-470.

Boulenger, G. A.
1889 Catalogue of the chelonians, rhynchocephalians, and crocodiles in the British Museum. Taylor and Francis, London.

Bronitsky, Gordon
1982 The Southwest and the Plains: ecology and economics. Plains Anthropologist 27(95):67-73.

Brooks, Robert L.
1987 The Arthur site: settlement and subsistence structure at a Washita River phase village. Oklahoma Archeological Survey, Studies in Oklahoma's Past, No. 15.

Bullard, William R., Jr.
1962 The Cerro Colorado site and pithouse architecture in the Southwestern United States prior to A.D. 900. Papers of the Peabody Museum of American Archaeology and Ethnology 44(2). Harvard University, Cambridge.

Campbell, Robert G.
1969 Prehistoric Panhandle culture on the Chaquaqua Plateau, southeast Colorado. Ph.D. dissertation, University of Colorado. University Microfilms, Ann Arbor.

Collins, Michael B.
1966 The Andrews Lake sites: evidence of semi-sedentary prehistoric occupation in Andrews County, Texas. Midland Archeological Society, Bulletin No. 1:27-43.

1968 The Andrews Lake locality: new archeological data from the southern Llano Estacado, Texas. Unpublished Master's thesis, University of Texas at Austin.

1971 A review of Llano Estacado archaeology and ethnohistory. Plains Anthropologist, 16(52):85-104.

1975 Lithic technology as a means of processual inference. In Lithic technology, making and using stone tools, edited by E. Swanson, pp. 15-35. Mouton Publishers, The Hague.

Cordell, Linda S.
1984 Prehistory of the Southwest. Academic Press, Inc., New York.

Corley, John A.
1965 Proposed eastern extension of the Jornada branch of the Mogollon culture. Southeastern New Mexico and West Texas Symposium Papers, Bulletin No. 1:30-36. Lea County Archeological Society.

Couzzourt, James E.
1982 Archaeological testing at Cal Farley's Boys Ranch, Oldham County, Texas. In Transactions of the 17th regional archaeological symposium for southeastern New Mexico and western Texas. Midland Archaeological Society, Midland, Texas.

Crabtree, Don E.
1972 An introduction to flintworking. Idaho State University Museum, Occasional Papers 28.

Davis, William B.
1978 The mammals of Texas. Texas Parks and Wildlife Department Bulletin 41. Austin, Texas.

Dillehay, Tom D.
1974 Late quaternary bison population changes on the Southern High Plains. Plains Anthropologist, 19(65):180-196.

Drass, Richard R. and Michael C. Moore
1987 The Linville II site (34RM492) and plains village manifestations in the mixed-grass prairie. Plains Anthropologist 32(118):404-418.

Duffield, Lathel F.
1970 Some Panhandle Aspect sites in Texas: their vertebrates and paleoecology. Ph.D. Dissertation, Department of Anthropology. University of Wisconsin, Madison.

Etchieson, Gerald M.
1979 Archaeological testing at the South Ridge site, Lake Meredith recreation area, Hutchinson County, Texas. Archaeological Research Lab, Killgore Research Center, West Texas State University, Canyon, Texas. National Park Service Purchase Order No. PX7029-8-0568.

Etchieson, Gerald M., Roberta D. Speer, and Jack T. Hughes
1977 An archaeological survey of certain tracts in and near Caprock Canyons State Park in eastern Briscoe County, Texas. Archaeological Research Lab, Killgore Research Center, West Texas State University, Canyon, Texas.

Farley, James A. and James D. Keyser
1979 Little Caney River prehistory: 1977 field season. University of Tulsa Laboratory of Archaeology, Contributions in Archaeology 5. Tulsa.

Ferring, C. Reid
1982 The Late Holocene prehistory of Delaware Canyon, Oklahoma. Institute of Applied Sciences, Contributions to Archaeology 1. North Texas State University, Denton.

1986 Late Holocene cultural ecology in the Southern Plains: perspectives from Delaware Canyon, Oklahoma. Plains Anthropologist 31(114, Part 2):56-82. Memoir 21.

Genoves, Santiago C.
1967 Proportionality of long bones and their relation to stature among Mesoamericans. American Journal of Physical Anthropology 26(1):67-77.

Gidley, James W.
1903 The fresh-water Tertiary of northwestern Texas. American Museum of Natural History Bulletin 19:617-635.

Gilbert, B. Miles and T.W. McKern
1973 A method for aging the female os pubis. American Journal of Physical Anthropology 38:31-38.

Gilmore, M. R.
1977 Use of plants by the Indians of the Missouri River region. University of Nebraska Press, Lincoln.

Gould, Charles N.
1906 The geology and water resources of the eastern portion of the panhandle of Texas. U.S. Geological Survey, Water Supply and Irrigation Paper No. 154. Washington: Government Printing Office.

Hall, Stephen A.
1982 Late Holocene paleoecology of the Southern Plains. Quaternary Research 17:391-407.

Hammond, George P. and Agapito Rey
1940 Narratives of the Coronado expedition, 1540-1542. Coronado Historical Series, vol. 2. University of New Mexico Press.

Haury, Emil W.
1936 The Mogollon culture of southwestern New Mexico. Medallion Papers 20. Gila Pueblo, Globe, Arizona.

Hays, Joe S.
1986 An archeological survey of portions of the Buffalo Lake National Wildlife Refuge Randall County, Texas. Prepared for U.S. Department of the Interior, Bureau of Reclamation Southwest Region, Amarillo, Texas.

Henry, Donald O., Barbara Butler, and Stephen A. Hall
1979 The late prehistoric human ecology of Birch Creek Valley, northeastern Oklahoma. Plains Anthropologist 24(85):207-238.

Hofman, Jack L.
1975 A study of Custer-Washita River foci relationships. Plains Anthropologist 20:41-51.

1978 The development and northern relationships of two archeological phases in the Southern Plains subarea. In The Central Plains Tradition: internal and external relationships, edited by Donald J. Blakeslee, pp. 6-35. Office of the State Archeologist, The University of Iowa.

1984 The Plains Villagers: the Custer phase. In Prehistory of Oklahoma, edited by Robert E. Bell, pp. 287-306. Academic Press, New York.

Holliday, Vance T.
1987 Cultural chronology. Chapter 3 in Lubbock Lake: late Quaternary studies on the Southern High Plains. Edited by Eileen Johnson. Texas A&M University Press, College Station.

Holliday, Vance T. and Curtis M. Welty
1981 Lithic tool resources of the eastern Llano Estacado. Bulletin of the Texas Archeological Society 52:201-214.

Hughes, Jack T.
n.d. Cultural development during the Archaic and NeoIndian stages on the Texas High Plains. Manuscript on file at the Archaeological Research Lab, Killgore Research Center, West Texas State University, Canyon, Texas.

1962 Lake Creek: a Woodland site in the Texas Panhandle. Bulletin of the Texas Archeological Society, vol.32:65-84. Austin, Texas.

1969 The Canyon City Club Cave, Randall County, Texas. Manuscript on file at the Texas Historical Commission, Austin, Texas.

1979a Cultural resources. In An environmental profile of the Palo Duro Creek Basin, pp. V-1 to V-117. Report submitted to the U.S. Army Corps of Engineers by Killgore Research Center, West Texas State University, Canyon, Texas.

1979b Archaeology of Palo Duro Canyon. The story of Palo Duro Canyon edited by Duane Guy, pp. 35-38. Canyon.

Hughes, Jack T., Charles Hood, Billy P. Newman, and Pollyanna Hughes
1977 Final report on an archaeological survey of the Red Deer Creek watershed in Gray, Robert, and Hemphill counties, Texas. Archaeological Research Lab, Killgore Research Center, West Texas State University, Canyon, Texas.

Hughes, Jack T. and Patrick S. Willey
1978 Archeology at Mackenzie Reservoir. Texas Historical Commission, Archeological Survey Report No. 24. Austin, Texas.

Irwin, H. J. and C. Irwin
1959 Excavations at the LoDaisKa site in the Denver, Colorado area. Denver Museum of Natural History, Proceedings No. 8.

Jelinek, Arthur J.
1967 A prehistoric sequence in the Middle Pecos Valley, New Mexico. Anthropological Papers, No. 31. Museum of Anthropology, University of Michigan, Ann Arbor.

Jennings, Jesse D.
1974 Prehistory of North America. McGraw-Hill, New York.

Johnson, Leroy, Jr.
1986 A plague of phases. Bulletin of the Texas Archeological Society 57:1-26.

Krieger, Alex D.
1946 Culture complexes and chronology in northern Texas. University of Texas Publication No. 4640. Austin.

Lancaster, James
1984 Groundstone artifacts. In The Galaz ruin: a prehistoric Mimbres village in southwestern New Mexico. The Maxwell Museum of Anthropology and the University of New Mexico Press.

Lang, R. W. and A. H. Harris
1984 The faunal remains from Arroyo Hondo Pueblo, New Mexico. School of American Research Press, Santa Fe, New Mexico.

Lehmer, Donald J.
1948 The Jornada branch of the Mogollon. University of Arizona Bulletin No. 69(2). Tucson.

Levine, Frances and Charles M. Mobley
1976 Archeological resources at Los Esteros Lake, New Mexico. Department of Anthropology, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.

Lintz, Christopher R.
1974 An analysis of the Custer focus and its relationship to the Plains village horizon in Oklahoma. Papers in Anthropology 15(2):1-72.

1976 The McGrath site of the Panhandle Aspect. Bulletin of the Oklahoma Anthropological Society 25:1-110.

1982 An overview of the Antelope Creek focus. Transactions of the 17th regional archaeological symposium for southeastern New Mexico and western Texas, pp. 37-56.

1986 The historical development of a culture complex: the basis for understanding architectural misconceptions of the Antelope Creek focus. Plains Anthropologist, 31(114, Part 2):111-128. Memoir 21.

Lintz, Christopher R. and Stephen A. Hall
1983 The geomorphology and archaeology of carnegie canyon. Fort Cobb laterals watershed, Caddo County, Oklahoma. Oklahoma Conservation Commission, Archaeological Research Report 10.

Lloyd, A.M, and W.C. Thompson
1929 Correlation of Permian outcrops on the eastern side of the West Texas Basin. American Association of Petroleum Geologists Bulletin 13:945-956.

Lobeck, A.K.
1957 Physiographic diagram of the United States. The Geographical Press, Maplewood, New Jersey.

Lovejoy, C. Owen
1985 Dental wear in the Libben population: it's functional pattern and role in the determination of adult skeletal age at death. American Jounal of Physical Anthropology 68:47-56.

McGregor, John C.
1965 Southwestern archaeology. University of Illinois Press, Urbana.

McKern, Thomas W.
1964 Indian skeletal material from the Jim Arnold site. Bulletin of the Texas Archaeological Society 35:95-99.

Marshall, Michael P.
1973 Background information on the Jornada culture area. In Human Systems Research Technical Manual, Tularosa Basin Survey. Human Systems Research, Inc., Three Rivers, New Mexico.

Mera, H. P.
1938 Reconnaissance and excavation in southeastern New Mexico. Memoirs of the American Anthropological Association, No. 51, Menasha.

Moore, Michael C.
1986 Western Oklahoma settlement patterns: a study of the Quartermaster Creek watershed, Roger Mills and Custer counties. Plains Anthropologist 31 (114, Part 2):97-110. Memoir 21.

Moorehead, W. K.
1931 Archeology of the Arkansas River Valley. Yale University Press, New Haven.

Olsen, Stanley J.
1960 Post-cranial skeletal characters of Bison and Bos. In Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. XXXV-no. 4. Peabody Museum.

Patton, Leroy T.
1923 The geology of Potter County. The University of Texas Bulletin No. 2330. Austin, Texas.

Pearce, W. M.
1936 A survey of the sandhill camp sites of Lamb and Bailey counties. Bulletin of the Texas Archaeological and Paleontological Society 8:184-186.

Rathjen, Frederick W.
1973 The Texas panhandle frontier. University of Texas Press, Austin, Texas.

Sayles, E. B.
1935 An archeological survey of Texas. Medallion Papers, vol. 17. Gila Pueblo, Globe, Arizona.

Schmidly, David J.
1983 Texas mammals east of the Balcones fault zone. Texas A&M University Press, College Station.

Scholes, F. V. and H. P. Mera
1940 Some aspects of the Jumano problem. Carnegie Contributions to American Anthropology and History, vol. 34, Washington.

Seidel, Michael E. and Hobart M. Smith
1986 Chrysemys, Pseudemys, Trachemys (Testudines: Emydidae): did Agassiz have it right? Herpetologica 42:242-248.

Sobolik, Kristin D. and D. Gentry Steele
n.d. An atlas of turtles to facilitate archaeological identification. Manuscript on file at the Department of Anthropology, Texas A&M University, College Station, Texas.

Steele, D. Gentry and Claud Bramblett
1988 The anatomy and biology of the human skeleton. Texas A&M University Press, College Station.

Stuiver, Minze and Gordon W. Pearson
1986 High precision calibration of the radiocarbon time scale, AD1950-500BC. Radiocarbon 28(2B):805-839.

Suhm, Dee A. and Edward B. Jelks
1962 Handbook of Texas archeology: type descriptions. Texas Archeological Society, Special Publications, No. 1 and Texas Memorial Museum, Bulletin No. 4.

Tharp, Benjamin C.
1952 Texas range grasses. University of Texas Press, Austin, Texas.

Trotter, Mildred and Goldine C. Gleser
1952 Estimation of stature from long bones of American whites and negroes. American Journal of Physical Anthropology 10:463-514.

Tunnell, Curtis D.
1964 Two burials from the Jim Arnold site in northwest Texas. Bulletin of the Texas Archaeological Society 35:83-94.

Turner, Ellen S. and Thomas R. Hester
1985 A field guide to stone artifacts of Texas Indians. Texas Monthly Press. Austin.

Ward, G.K. and S.R. Wilson
1978 Procedures for comparing and combining radiocarbon age determinations: a critique. Archeometry 20(1):19-31.

Watts, W. C.
1963 Distribution of pottery in surface sites on the South Plains of Texas. South Plains Archeological Society Bulletin 1:1-25.

Wedel, Waldo R.
1961 Prehistoric man on the Great Plains. University of Oklahoma Press, Norman, Oklahoma.

1975 Chalk Hollow: culture sequence and chronology in the Texas Panhandle. Actas del XLI Congreso Internacional De Americanistas. 1:271-278, Mexico, D.F.

Weniger, Del
1984 The explorers' Texas. Eakin Press, Austin, Texas.

Whalen, Michael E.
1977 Settlement pattern of the eastern Hueco Bolson. Anthropological Paper No. 4. El Paso Centennial Museum, University of Texas at El Paso.

Wheat, Joe B.
1954 Crooked Ridge Valley (Arizon W:10:15). University of Arizona Social Science Bulletin, 24. Tucson.

1955 Mogollon culture prior to A.D. 1000. American Anthropologist 57(2), part 3, Memoir 82. Menasha, Wisconsin.

Willey, Gordon R. and Philip Phillips
1958 Method and theory in American archaeology. University of Chicago Press, Chicago.

Witte, A. H.
1947 Certain archaeological notes on the High Plains of Texas. Bulletin of the Texas Archeological and Paleontological Society 18:76-82.

Word, James H.
1965 The Montgomery site. Bulletin of the South Plains Archeological Society 2:55-102.

Yanovsky, Elias
1936 Food plants of the North American Indians. United States Department of Agriculture, Miscellaneous Publications, 237. Washington D.C.

Yarnell, R. A.
1965 Aboriginal relationships between culture and plant life in the Upper Great Lakes region. University of Michigan, Museum of Anthropology, Anthropological Papers 23.

1978 Domestication of sunflower and sumpweed in Eastern North America. In The nature and status of ethnobotany, edited by R. Ford. University of Michigan, Museum of Anthropology, Anthropological Papers 67:289-300.

APPENDIX I

41HL66 SKELETAL ANALYSIS

By Beth Miller

41HL66 SKELETAL ANALYSIS

During excavation of Structure 1 at the Kent Creek site (41HL66), a human skeleton was uncovered in a subfloor pit. The individual was an adult female, buried semi-flexed on the back, head to the west facing southeast. The arms were folded across the chest and the legs were folded to the right and drawn up towards the chest. The grave was a circular pit, approximately 90 cm in diameter and 60 cm deep. Grave goods included three mussel shells, a bone awl fashioned from a deer metapodial, and three awl blanks, also fashioned from deer metapodials. A radiocarbon sample from the floor of the structure produced a date of A.D. 710 $\pm$ 120.

This analysis includes a burial inventory, taphonomic analysis of the remains, evaluation of the age and sex of the individual, and a review of the observed pathological conditions present in the sample.

DESCRIPTION OF THE REMAINS

A cranium; the mandible; both clavicles; both scapulae; the sternum; both humeri; both radii; both ulnae; miscellaneous carpals, metacarpals, and phalanges; several cervicle, thoracic, and lumbar vertebrae; several ribs; a complete pelvis; both femora; both tibiae; both fibulae; and miscellaneous tarsals, metatarsals, and phalanges were recovered from the burial. The remains are generally in a good state of preservation though many are broken, probably by earth and rock pressures and burrowing rodents. Many are warped. The skull was so fragmented and warped that, despite the large and well-preserved

cranial parts, a complete reconstruction was not possible. As a result, cranial measurements and indices could not be obtained.

Sex

The sex of the individual is probably female, based on the width of the sciatic notch, the subpubic angle, and the general size and morphology of the os coxae, the sacral index, and features of the cranium and mandible such as general size and morphology, gonial angle, supraorbital tori, size and morphology of the mastoid process, and size and morphology of the frontal and parietal bosses (Steele and Bramblett 1988).

Age

The individual is an old adult, approximately 32-52 years of age based on morphological changes of the pubic symphysis (Gilbert and McKern 1973). Occlusal attrition, a less accurate method of age estimation because of variations in wear caused by environmental and cultural agents, especially on the right mandibular third molar indicates a younger adult, possibly 20-25 years of age (Lovejoy 1985).

Stature

Stature was estimated on the basis of the incomplete left femur and complete left tibia according to criteria set forth in Genoves (1967) and Trotter and Gleser (1952). Femur length was estimated using Steele and Bramblett (1988). Based on these methods, stature for this individual is estimated at 155 cm (62 inches) to 160 cm (64 inches).

Pathological Conditions

Several pathological conditions were observed in this individual. It appears that some slight porotic hyperostosis was present, however the conservation material (a glue and water mixture) obscured the cranium and this condition is open to interpretation. Porotic hyperostosis is thought to be a skeletal manifestation of anemia caused by expansion of the diploe and hypertrophy of the outer table of the cranium, and is visible as small pits or even exposed diploe on the parietals and occipital above the highest nuchal line. The vault did not appear thickened over this area.

Severe antemortem degeneration of the cervicle vertebrae was also noted, as evidenced by expansion of the centrum, vertebral lipping, and burnishing. The degeneration of the cervicle vertebrae appears to be the result of some chronic trauma to the neck, possibly of the sort a tump line would cause. There were slight marks on the cranium which might be attributable to a tump line.

Arthritic lipping was seen on the thoracic and lumbar vertebrae. Arthritic lipping was also visible on the femur and tibia joints of both legs. Some very slight periosteal infection was also noted on both tibiae.

Degeneration of the temporomandibular joint was noted on the right coronoid process of the mandible and on the right mandibular condyle.

DISCUSSION AND SUMMARY

The skeletal remains recovered from a subfloor pit in Structure 1

at 41HL66 appear to represent the nearly complete skeleton of an old female, approximately 62-64 inches tall. The individual had indications of arthritic degeneration of the knees and back, and chronic stress to the neck.

Unfortunately, the cranium was so badly fragmented and warped that reconstruction was not possible. Consequently, the measurements and indices necessary to compare the skull with other craniums recovered from the region are not available.

Only a few burials have been reported that are possibly associated with the Palo Duro phase. These include the Kent Creek burial (this report), the Deadman's Shelter burial (Hughes and Willey 1978), and the two Arnold burials found less than one mile west of the Kent Creek site and reported by Tunnell (1964) and McKern (1964). The grave assemblages of these burials are strikingly similar. Each contained awls, awl blanks, and mussel shells. The Deadman's Shelter burial also contained the shell of a yellow mud turtle. The similarities of the assemblages suggest that these mortuary offerings are characteristic of Palo Duro phase burials.

Before questions concerning age and sex distributions and morphological and biological affinities for the Palo Duro phase can be addressed, additional burials will have to be investigated and comparative studies made.

APPENDIX II

41HL66 ARTIFACT INVENTORY

41HL66 ARTIFACT INVENTORY

Archaeological specimens are customarily cataloged by a numerical system, which, though it renders bookkeeping simple, it gives no indication of the spatio-temporal disposition of the artifact *in situ*. To overcome this difficulty, the following cataloging system was adopted:

For Artifacts Recovered from Excavated Squares

The initial letter of the catalog number (e.g., A-1-A-1) designates the excavation block. Block A was begun in 1985 and continued in 1986; Block B was laid off but was never opened. Thus, the catalog number on all the artifacts begins with the letter A. The number following the first letter refers to the square in which the artifact was recovered. The second letter indicates the level at which it was found (A=level 1, B=level 2, C=level 3, D=level 4, E=level 5, F=level 6). The last number distinguishes the artifact from others found in the same square and level. Thus A-1-A-1 indicates that the artifact was recovered from excavation A, in square 1 of that excavation, level 1, and that it was the first artifact from that square and level. (NOTE: Because of the large number of debitage items, individual flakes were not given separate catalog numbers. Rather, the flakes were grouped by material type [e.g., Tecovas jasper] and each material group given a catalog number).

For Artifacts Recovered from Features

The initial letter again denotes the excavation block. The following letters and the number after them indicate the feature and

its number. The final number distinguishes the artifact from others in the same feature. Thus A-Fe7-19 indicates that the artifact was recovered in excavation A in Feature 7, and was the 19th specimen encountered in that feature.

**Denotes items not counted in Grand Total.*

N16-17 W4-5 Lev. 1 Stratum 1

A-1-A-1	Tecovas flakes (1 burned)	N=4
		4

N16-17 W4-5 Lev. 2 Stratum 2a

A-1-B-1	Tecovas Deadman arrowpoint fragment	N=1
A-1-B-2	Potter chert end scraper fragment	N=1
A-1-B-3	Tecovas knife fragment	N=1
A-1-B-4	Tecovas flakes (28 burned)	N=89
A-1-B-5	Mussel shell	N=1
A-1-B-6	Potter chert flakes	N=3
A-1-B-7	Opaline flakes	N=3
A-1-B-8	Edwards chert flake	N=1
A-1-B-9	Dakota Quartzite flakes	N=24
A-1-B-10	Tecovas core	N=1
		125

N16-17 W4-5 Lev. 3 Stratum 2b

A-1-C-1	Tecovas core remnant	N=1
A-1-C-2	Tecovas core remnant	N=1
A-1-C-3	*Graphia shell	N=1
A-1-C-4	Tecovas flakes (5 burned)	N=33
A-1-C-5	Flake-unidentified material	N=1
A-1-C-6	Potter chert flakes	N=3
A-1-C-7	Alibates flake	N=1
A-1-C-8	Vertebrata fragment	N=1
A-1-C-9	Untested Tecovas cobble	N=1
A-1-C-10	Tecovas side scraper fragment	N=1
A-1-C-11	Tecovas Deadman arrowpoint	N=1
		44

N16-17 W4-5 Lev. 4 Stratum 2b

A-1-D-1	Opaline flakes	N=3
A-1-D-2	Alibates arrowpoint preform (tip missing)	N=1
A-1-D-3	Tecovas flakes (2 burned)	N=42
A-1-D-4	Potter chert core remnant	N=1
A-1-D-5	Tecovas biface fragment	N=1
A-1-D-6	Tecovas retouched flake	N=1
A-1-D-7	Medium/Large mammal bone fragment	N=1
	Vertebrata fragments (1 burned)	N=2
A-1-D-8	Tecovas core	N=1
		53

N16-17 W4-5 Lev. 5 Stratum 2b

A-1-E-1	Tecovas Scallorn arrowpoint	N=1
A-1-E-2	Tecovas arrowpoint midsection	N=1
A-1-E-3	Tecovas arrowpoint tip	N=1
A-1-E-4	Potter chert flakes	N=2
A-1-E-5	Unidentified Turtle shell fragment	N=1
A-1-E-6	Tecovas core	N=1
A-1-E-7	Tecovas core	N=1
A-1-E-8	Vertebrata fragments (3 burned)	N=5
A-1-E-9	Tecovas flakes (15 burned)	N=53
		66

N17-18 W3-4 Lev. 1 Stratum 1

A-2-A-1	Opaline flake	N=1
A-2-A-2	Potter chert flakes	N=3
A-2-A-3	Burned Alibates flakes	N=2
A-2-A-4	Petrified wood flake	N=1
A-2-A-5	Tecovas retouched flake	N=1
A-2-A-6	Tecovas flakes (40 burned)	N=86
A-2-A-7	Tecovas arrowpoint midsection	N=1
A-2-A-8	Tecovas unidentified biface fragment	N=1
		96

N17-18 W3-4 Lev. 2 Stratum 2a

A-2-B-1	Potter chert flakes	N=4
A-2-B-2	Tecovas flakes (23 burned)	N=82
A-2-B-3	Tecovas retouched flake	N=1
A-2-B-4	Tecovas arrowpoint tip	N=1
A-2-B-5	Tecovas arrowpoint tang	N=1
A-2-B-6	*Graphia shell	N=1
		89

N17-18 W3-4 Lev. 3 Stratum 2b

A-2-C-1	Potter chert flakes	N=3
A-2-C-2	Tecovas flakes (14 burned)	N=48
A-2-C-3	Tecovas drill	N=1
A-2-C-4	Medium/Large mammal bone frag. (burned)	N=1
		53

N17-18 W3-4 Lev. 4 Stratum 2b

A-2-D-1	Tecovas flakes (25 burned)	N=97
A-2-D-2	Dakota Quartzite flakes	N=5
A-2-D-3	Tecovas core remnant	N=1
A-2-D-4	Petrified wood flake	N=1
A-2-D-5	Alibates flakes (2 burned)	N=5
A-2-D-6	Potter chert flakes (4 burned)	N=7
A-2-D-7	*Charcoal sample	N=1
A-2-D-8	Unidentified Turtle shell fragment	N=1
	Vertebrata fragment (burned)	N=1
A-2-D-9	Tecovas knife	N=1
A-2-D-10	Tecovas Scallorn arrowpoint	N=1
A-2-D-11	Tecovas arrowpoint tip	N=1
A-2-D-12	Metate fragment	N=1
		122

N17-18 W2-3 Lev. 1 Stratum 1

A-3-A-1	Tecovas flakes (5 burned)	N=18
		18

N17-18 W2-3 Lev. 2 Stratum 2a

A-3-B-1	Mussel shell fragments	N=4
A-3-B-2	Incised mussel shell; pendant fragment	N=1
A-3-B-3	Tecovas flakes (16 burned)	N=45
A-3-B-4	Potter chert flakes	N=2
A-3-B-5	Tecovas cores	N=2
		54

N17-18 W2-3 Lev. 3 Stratum 2b

A-3-C-1	Petrified wood flakes	N=3
A-3-C-2	Quartzite flake	N=1
A-3-C-3	Potter chert flakes	N=5
A-3-C-4	Tecovas flakes (35 burned)	N=101
A-3-C-5	*Graphia shell	N=1
A-3-C-6	Large mammal long bone fragment	N=1
	Vertebrata fragments (1 burned)	N=4
	Mussel shell fragment	N=1
A-3-C-7	Quartzite Mano fragment	N=1
		117

N17-18 W2-3 Lev. 4 Stratum 2b

A-3-D-1	Tecovas core	N=1
A-3-D-2	Middle Pecos Micaceous Brown olla sherd	N=1
A-3-D-3	Tecovas arrowpoint preform fragment	N=1
A-3-D-4	Burned Alibates flakes	N=2
A-3-D-5	Vertebrata fragments (1 burned)	N=3
A-3-D-6	*Charcoal sample	N=1
A-3-D-7	Petrified wood flake	N=1
A-3-D-8	Sandstone Mano (unifacial-beveled)	N=1
A-3-D-9	Potter chert flakes	N=3
A-3-D-10	Tecovas flakes (19 burned)	N=118
		132

N18-19 W2-3 Lev. 1 Stratum 1

A-4-A-1	Tecovas flakes (11 burned)	N=25
A-4-A-2	Potter chert flakes	N=2
A-4-A-3	Petrified wood flake	N=1
		28

N18-19 W2-3 Lev. 2 Stratum 2a

A-4-B-1	Potter chert flakes	N=11
A-4-B-2	Tecovas flakes	N=133
A-4-B-3	Alibates flake	N=1
A-4-B-4	Tecovas core remnants	N=2
A-4-B-5	Tecovas arrowpoint preform (tip missing)	N=1
A-4-B-6	Obsidian arrowpoint fragment	N=1
A-4-B-7	Mussel shell fragment	N=1
		150

N18-19 W2-3 Lev. 3 Stratum 2b

A-4-C-1	Tecovas crude biface fragment	N=1
A-4-C-2	Vertebrata bone fragments (burned)	N=6
A-4-C-3	Large mammal enamel tooth fragments	N=2
A-4-C-4	Tecovas flakes (37 burned)	N=79
A-4-C-5	Tecovas core remnants	N=3
A-4-C-6	Potter chert core remnant	N=1
A-4-C-7	Potter chert flakes	N=2
A-4-C-8	Alibates flakes	N=2
		96

N18-19 W2-3 Lev. 4 Stratum 2b

A-4-D-1	Tecovas arrowpoint tip	N=1
A-4-D-2	Vertebrata fragments (burned)	N=3
A-4-D-3	Opaline core remnant	N=1
A-4-D-4	Mussel shell fragment	N=1
A-4-D-5	Tecovas core remnant	N=1
A-4-D-6	Tecovas core remnant	N=1
A-4-D-7	Tecovas core remnant	N=1
A-4-D-8	Edwards chert scraper fragment	N=1
A-4-D-9	Potter chert flakes	N=4
A-4-D-10	Medium/Large mammal bone fragment	N=1
A-4-D-11	Edwards chert flake	N=1
A-4-D-12	Quartzite flake	N=1
A-4-D-13	Tecovas flakes (16 burned)	N=55
A-4-D-14	Petrified wood flakes	N=3
A-4-D-15	Tecovas knife fragment	N=1
		76

N17-18 W4-5 Lev. 1 Stratum 1

A-5-A-1	Tecovas flakes (11 burned)	N=41
A-5-A-2	Quartzite flake	N=1
		42

N17-18 W4-5 Lev. 2 Stratum 2a

A-5-B-1	Tecovas Deadman arrowpoint	N=1
A-5-B-2	Tecovas flakes (43 burned)	N=113
A-5-B-3	Potter chert flakes (4 burned)	N=6
A-5-B-4	Petrified wood flakes	N=2
		122

N17-18 W4-5 Lev. 3 Stratum 2b

A-5-C-1	Edwards Scallorn arrowpoint	N=1
A-5-C-2	Potter chert flakes	N=7
A-5-C-3	Petrified wood flake	N=1
A-5-C-4	Alibates flakes	N=2
A-5-C-5	Tecovas flakes (31 burned)	N=97
A-5-C-6	Edwards chert flake	N=1
A-5-C-7	Gastropod shell	N=1
		110

N17-18 W4-5 Lev.4 Stratum 2b

A-5-D-1	Tecovas biface fragment	N=1
A-5-D-2	Tecovas flakes (32 burned)	N=94
A-5-D-3	Potter chert flakes	N=5
A-5-D-4	Medium/Large mammal fragment	N=1
	Gastropod fragment	N=1
	Vertebrata fragments	N=3
A-5-D-5	Tecovas core	N=1
		106

N17-18 W4-5 Lev. 5 Stratum 2b

A-5-E-1	Tecovas flakes (42 burned)	N=79
A-5-E-2	Potter chert flakes	N=5
A-5-E-3	*Graphia shell	N=1
A-5-E-4	Mussel shell fragments	N=1+
A-5-E-5	Pronghorn Antelope medial phalange	N=1
	Testudinata shell fragment (burned)	N=1
	Vertebrata fragments (3 burned)	N=18
A-5-E-6	Petrified wood flake	N=1
A-5-E-7	Alibates flake	N=1
A-5-E-8	Flake-unidentified material	N=1
		108

N18-19 W3-4 Lev. 2 Stratum 2a

A-6-B-1	Jornada Brownware sherd	N=1
A-6-B-2	Potter chert flakes (2 burned)	N=7
A-6-B-3	Tecovas core remnant	N=1
A-6-B-4	Opaline flake	N=1
A-6-B-5	Tecovas side scraper fragment	N=1
A-6-B-6	Tecovas flakes (15 burned)	N=89
A-6-B-7	Tecovas Deadman arrowpoint	N=1
		101

N18-19 W3-4 Lev.3 Stratum 2b

A-6-C-1	Middle Pecos Micaceous Brown sherd	N=1
A-6-C-2	Tecovas Deadman arrowpoint	N=1
A-6-C-3	Alibates flakes (1 burned)	N=2
A-6-C-4	Edwards flakes (1 burned)	N=2
A-6-C-5	Dakota Quartzite flakes	N=3
A-6-C-6	Petrified wood flakes	N=2
A-6-C-7	Opaline flakes	N=4
A-6-C-8	Tecovas flakes (31 burned)	N=109
A-6-C-9	Potter chert flakes (3 burned)	N=13
A-6-C-10	Vertebrata fragments (3 burned)	N=5
A-6-C-11	Mussel shell fragments	N=3
A-6-C-12	Quartzite Mano fragments	N=2
		147

N18-19 W3-4 Lev. 4 Stratum 2b

A-6-D-1	Tecovas biface fragment	N=1
A-6-D-2	Dakota Quartzite flakes	N=4
A-6-D-3	Tecovas flakes (43 burned)	N=153
A-6-D-4	Vertebrata fragments	N=7
A-6-D-5	Petrified wood flake	N=1
A-6-D-6	Alibates flake	N=1
A-6-D-7	Tecovas crude biface fragment	N=1
A-6-D-8	Potter chert flakes (3 burned)	N=13
A-6-D-9	Rodentia incisor	N=1
	Vertebrata fragments (6 burned)	N=12
A-6-D-10	Tecovas retouched flake (burned)	N=1
A-6-D-11	Tecovas retouched flake	N=1
A-6-D-12	Tecovas core	N=1
		197

N18-19 W4-5 Lev. 2 Stratum 2a

A-7-B-1	Potter chert flakes	N=6
A-7-B-2	Potter chert core remnant	N=1
A-7-B-3	Tecovas core remnant	N=1
A-7-B-4	Tecovas core remnant	N=1
A-7-B-5	Tecovas arrowpoint preform (tip missing)	N=1
A-7-B-6	*16 gauge shotgun cap & .22 hull	N=2
A-7-B-7	Tecovas flakes (9 burned)	N=100
A-7-B-8	Quartzite flakes	N=4
A-7-B-9	Edwards chert flake	N=1
A-7-B-10	Petrified wood flake	N=1
A-7-B-11	Alibates flakes (burned)	N=2
		118

N18-19 W4-5 Lev. 3 Stratum 2b

A-7-C-1	Potter chert flakes (1 burned)	N=4
A-7-C-2	Tecovas flakes (35 burned)	N=89
A-7-C-3	Petrified wood flakes	N=2
A-7-C-4	Edwards chert flake	N=1
A-7-C-5	Mussel shell fragments	N=4
		100

N18-19 W4-5 Lev. 4 Stratum 2b

A-7-D-1	Mussel shell fragment	N=1
A-7-D-2	Opaline flake	N=1
A-7-D-3	Potter chert flakes	N=2
A-7-D-4	Alibates flakes	N=2
A-7-D-5	Dakota Quartzite flakes	N=5
A-7-D-6	Tecovas flakes (18 burned)	N=78
A-7-D-7	Tecovas retouched flake	N=1
A-7-D-8	Quartzite flake	N=1
A-7-D-9	*Graphia shell	N=1
A-7-D-10	Tecovas side scraper fragment	N=1
		92

N18-19 W4-5 Lev. 5 Stratum 2b

A-7-E-1	Tecovas flakes (22 burned)	N=80
A-7-E-2	Potter chert flakes	N=8
A-7-E-3	Obsidian flake	N=1
A-7-E-4	Mussel shell fragment	N=1
A-7-E-5	*Charcoal sample	N=1
A-7-E-6	Turtle shell left carapace plate (burned)	N=1
A-7-E-7	Vertebrata long bone fragment (burned)	N=1
	Vertebrata fragments (7 burned)	N=29
A-7-E-8	Quartzite Mano fragment	N=1
		122

N17-18 W1-2 Lev.3 Stratum 2b

A-8-C-1	Tecovas flakes (43 burned)	N=93
A-8-C-2	Mussel shell w/serrated edge	N=1
A-8-C-3	Potter chert flakes (2 burned)	N=8
A-8-C-4	Tecovas core	N=1
A-8-C-5	Sandstone mano fragment	N=1
A-8-C-6	Petrified wood flake	N=1
		105

N19-20 W2-3 Lev. 2 Stratum 2a

A-9-B-1	Tecovas flakes (6 burned)	N=70
A-9-B-2	Potter chert flakes	N=14
A-9-B-3	Opaline flakes	N=6
A-9-B-4	Alibates flakes	N=2
A-9-B-5	Vertebrata fragments	N=2
A-9-B-6	Tecovas flake scraper fragment	N=1
		95

N19-20 W2-3 Lev.3 Stratum 2b

A-9-C-1	Roswell Brownware sherd	N=1
A-9-C-2	Petrified wood flakes (1 burned)	N=3
A-9-C-3	Alibates flakes (2 burned)	N=6
A-9-C-4	Dakota Quartzite flakes	N=2
A-9-C-5	Tecovas flakes (17 burned)	N=63
A-9-C-6	Potter chert flakes (4 burned)	N=12
A-9-C-7	Potter chert core	N=1
		88

N19-20 W2-3 Lev. 4 Stratum 2b

A-9-D-1	Tecovas flakes (16 burned)	N=32
A-9-D-2	Potter chert flakes	N=4
A-9-D-3	Tecovas arrowpoint stem	N=1
A-9-D-4	Potter chert core	N=1
		38

N18-19 W5-6 Lev. 2 Stratum 2a

A-10-B-1	Sandstone flake	N=1
A-10-B-2	Tecovas flakes (16 burned)	N=60
		61

N18-19 W5-6 Lev. 3 Stratum 2b

A-10-C-1	Vertebrata fragment (burned)	N=1
A-10-C-2	Tecovas biface fragment	N=1
A-10-C-3	Tecovas side scraper fragment	N=1
A-10-C-4	Potter chert flakes	N=3
A-10-C-5	Tecovas flakes (35 burned)	N=102
A-10-C-6	Alibates flake	N=1
		109

N18-19 W5-6 Lev.4 Stratum 2b

A-10-D-1	Roswell Brownware sherd	N=1
A-10-D-2	Potter chert flakes (burned)	N=3
A-10-D-3	Alibates flakes (burned)	N=2
A-10-D-4	Tecovas unidentified biface fragment	N=1
A-10-D-5	Edwards chert flakes (burned)	N=2
A-10-D-6	Tecovas flakes (28 burned)	N=78
A-10-D-7	*Graphia shell	N=1
A-10-D-8	Vertebrata fragments	N=2
A-10-D-9	Sandstone metate fragment	N=1
		90

N18-19 W5-6 Lev. 5 Stratum 2b

A-10-E-1	Tecovas Deadman arrowpoint	N=1
A-10-E-2	Tecovas arrowpoint tang	N=1
A-10-E-3	Mussel shell fragment	N=1
A-10-E-4	Burned Alibates flakes	N=3
A-10-E-5	Potter chert flakes	N=6
A-10-E-6	Potter chert core	N=1
A-10-E-7	Petrified wood flake	N=1
A-10-E-8	Tecovas flakes (9 burned)	N=46
A-10-E-9	*Charcoal sample	N=1
A-10-E-10	Artiodactyla Right tibia, distal end	N=1
	Vertebrata fragments	N=17
		78

N18-19 W5-6 Lev. 6 Stratum 2b (Feature 5 area)

A-10-F-1	Brownware olla sherd (Panhandle type)	N=1
A-10-F-2	Potter chert flakes (1 burned)	N=8
A-10-F-3	Alibates flakes	N=3
A-10-F-4	Tecovas side scraper	N=1
A-10-F-5	Tecovas flakes (8 burned)	N=60
A-10-F-6	Dakota Quartzite flake	N=1
A-10-F-7	Petrified wood flake	N=1
A-10-F-8	*Charcoal sample	N=1
A-10-F-9	Prairie Dog right mandibular frag.	N=1
	Medium/Large mammal long bone fragment	N=1
	Medium/Large mammal fragment	N=1
	Vertebrata fragments (1 burned)	N=4
		82

N18-19 W1-2 Lev. 2 Stratum 2a

A-11-B-1	Mussel shell fragments	N=2
A-11-B-2	Vertebrata fragment (burned)	N=1
A-11-B-3	Tecovas flakes (15 burned)	N=34
A-11-B-4	Tecovas core remnants	N=2
A-11-B-5	Potter chert flakes	N=2
A-11-B-6	Alibates flakes	N=4
		45

N18-19 W1-2 Lev. 3 Stratum 2b

A-11-C-1	Tecovas biface fragment	N=1
A-11-C-2	Mussel shell fragments	N=5
A-11-C-3	Tecovas flakes (5 burned)	N=29
A-11-C-4	Alibates flakes	N=7
A-11-C-5	Tecovas core remnant	N=1
		43

N18-19 W1-2 Lev. 4 Stratum 2b

A-11-D-1	Tecovas flakes (30 burned)	N=73
A-11-D-2	Tecovas core remnants	N=2
A-11-D-3	Tecovas side scraper	N=1
A-11-D-4	Potter chert flakes	N=3
A-11-D-5	Mussel shell fragments	N=6
		85

N19-20 W1-2 Lev. 2 Stratum 2a

A-12-B-1	Middle Pecos Micaceous Brown sherd	N=1
A-12-B-2	Middle Pecos Micaceous Brown sherd	N=1
A-12-B-3	Tecovas arrowpoint tip	N=1
A-12-B-4	Potter chert flakes (9 burned)	N=18
A-12-B-5	Burned Alibates flakes	N=2
A-12-B-6	Opaline flakes	N=1
A-12-B-7	Tecovas flakes (21 burned)	N=122
A-12-B-8	Tecovas chopper	N=1
A-12-B-9	Medium/Large mammal fragment	N=1
	Vertebrata fragments	N=3
A-12-B-10	Tecovas core	N=1
		152

N19-20 W1-2 Lev. 3 Stratum 2b

A-12-C-1	Edwards chert flake	N=1
A-12-C-2	Tecovas flakes (17 burned)	N=71
A-12-C-3	Petrified wood flakes	N=2
A-12-C-4	Potter chert flakes	N=8
A-12-C-5	Burned Daub (w/stick impression)	N=1
A-12-C-6	*Graphia shell	N=1
A-12-C-7	Vertebrata fragments (1 burned)	N=2
		85

N19-20 W1-2 Lev. 4 Stratum 2b

A-12-D-1	Tecovas flakes (51 burned)	N=102
A-12-D-2	Potter chert flakes (5 burned)	N=7
A-12-D-3	Tecovas retouched flake	N=1
A-12-D-4	Petrified wood flake	N=1
A-12-D-5	Tecovas arrowpoint midsection (burned)	N=1
A-12-D-6	Rodentia incisor	N=1
A-12-D-7	Large mammal fragment	N=1
	Medium/Large mammal fragment (burned)	N=1
	Vertebrata fragments (1 burned)	N=6
A-12-D-8	Tecovas core	N=1
		122

N16-17 W2-4 Test Unit (All Levels)

A-13-A-1	Roswell Brown sherd	N=1
A-13-A-2	Tecovas Ellis dart point stem	N=1
A-13-A-3	Tecovas unidentified arrowpoint	N=1
A-13-A-4	Tecovas arrowpoint tip	N=1
A-13-A-5	Petrified wood knife	N=1
A-13-A-6	Tecovas side scraper	N=1
A-13-A-7	Tecovas knife fragment	N=1
A-13-A-8	Tecovas arrowpoint preform (tip missing)	N=1
A-13-A-9	Tecovas retouched flake	N=1
A-13-A-10	Tecovas flakes (90 burned)	N=499
A-13-A-11	Burned Alibates flakes	N=16
A-13-A-12	Potter chert flakes (25 burned)	N=51
A-13-A-13	Quartzite flakes	N=2
A-13-A-14	Edwards chert flakes (1 burned)	N=4
A-13-A-15	Petrified wood flakes	N=3
A-13-A-16	Tecovas core remnants	N=5
A-13-A-17	Sandstone Mano fragment	N=1
A-13-A-18	Sandstone Mano fragment	N=1
A-13-A-19	Sandstone Mano fragment	N=1
A-13-A-20	*Burned rocks	N=39
A-13-A-21	*Charcoal sample	N=1
A-13-A-22	Large mammal enamel tooth fragment	N=1
A-13-A-23	Mussel shell	N=9
A-13-A-24	Charred acorn	N=1
A-13-A-25	Tecovas Ellis dart point stem	N=1
		604

N19-20 W5-6 Lev. 1 Stratum 1 (Feature 5 area)

A-14-A-1	Tecovas flakes (26 burned)	N=84
A-14-A-2	Petrified wood flakes (burned)	N=3
A-14-A-3	Potter chert flakes (2 burned)	N=3
A-14-A-4	Tecovas retouched flake	N=1
A-14-A-5	Tecovas arrowpoint preform	N=1
A-14-A-6	Tecovas biface tip	N=1
A-14-A-7	Edwards side scraper fragment	N=1
		94

N19-20 W5-6 Lev. 3 Stratum 2b (Feature 5 area)

A-14-C-1	Tecovas flakes (18 burned)	N=58
A-14-C-2	Potter chert flakes	N=4
A-14-C-3	Quartzite flake	N=1
A-14-C-4	Tecovas retouched flake	N=1
A-14-C-5	Edwards chert flake	N=1
A-14-C-6	Gastropods	N=10
		75

N19-20 W5-6 Lev. 4 Stratum 2b (Feature 5 area)

A-14-D-1	Artiodactyla astragalus fragment	N=1
	Lagomorpha (4 left mandibular teeth)	N=4
	Turtle shell left carapace plate (burned)	N=1
	Vertebrata fragment (1 burned)	N=2
A-14-D-2	Jornada Brownware olla sherd	N=1
A-14-D-3	*Charcoal sample (submitted for C-14 date)	N=1
A-14-D-4	Potter chert flakes	N=2
A-14-D-5	Dakota Quartzite flakes	N=5
A-14-D-6	Tecovas flakes (17 burned)	N=75
A-14-D-7	Sandstone Mano	N=1
		94

N19-20 W5-6 Lev. 4 Stratum 2b (Feature 5 area)

A-14-D-1	Quartzite mano fragment	N=1
A-14-D-2	Water Turtle carapace plate	N=1
	Vertebrata fragments	N=2
A-14-D-3	Bison proximal phalange	N=1
A-14-D-4	Tecovas crude biface	N=1
A-14-D-5	Sandstone flake	N=1
A-14-D-6	*C-14 sample	N=1
		7

N19-20 W5-6 Lev. 5 Stratum 2b (Feature 5 area)

A-14-E-1	Tecovas flakes (25 burned)	N=60
A-14-E-2	Petrified wood flake	N=1
A-14-E-3	Mussel shell	N=3
A-14-E-4	*Charcoal sample	N=1
A-14-E-5	Vertebrata fragments (1 burned)	N=3
		67

N19-20 W5-6 Lev. 6 Stratum 2c (Feature 5 area)

A-14-F-1	Large mammal long bone fragment	N=1
	Artiodactyla distal metapodial fragment	N=1
	Medium/Large mammal fragment	N=1
	Vertebrata fragments (10 burned)	N=24
A-14-F-2	Tecovas flakes (20 burned)	N=91
A-14-F-3	Potter chert flakes	N=7
A-14-F-4	Tecovas core remnant	N=1
A-14-F-5	Tecovas knife fragment	N=1
A-14-F-6	Tecovas flake scraper fragment	N=1
		128

N19-20 W0-1 Lev. 2 Stratum 2b

A-15-B-1	Potter chert flake	N=1
A-15-B-2	Tecovas flakes (3 burned)	N=7
		8

N19-20 W0-1 Lev. 3 Stratum 2b

A-15-C-1	Tecovas flakes (20 burned)	N=64
A-15-C-2	Potter chert flakes (2 burned)	N=6
A-15-C-3	Mussel shell fragments	N=2
A-15-C-4	Petrified wood flake	N=1
A-15-C-5	*Graphia shell fragment	N=1
A-15-C-6	Vertebrata fragment (burned)	N=1
		74

N19-20 W0-1 Lev. 4 Stratum 2b

A-15-D-1	Tecovas flakes (21 burned)	N=44
A-15-D-2	Alibates flakes	N=2
A-15-D-3	Potter chert flakes	N=2
A-15-D-4	Flake-unidentified material	N=1
		49

N19-20 W0-1 Lev. 5 Stratum 2b

A-15-E-1	Tecovas flakes (16 burned)	N=33
A-15-E-2	Potter chert flakes	N=3
A-15-E-3	Vertebrata fragment	N=1
		37

N19-20 W0-1 Lev. 6 Stratum 2c

A-15-F-1	Tecovas flakes (4 burned)	N=27
A-15-F-2	Vertebrata fragment	N=1
		28

N19-20 W4-5 Lev. 7 Stratum 2c

A-15-G-1	Tecovas flakes (3 burned)	N=4
		4

N20-21 W1-2 Lev. 2 Stratum 2a

A-16-B-1	Tecovas flakes (7 burned)	N=13
A-16-B-2	Potter chert flakes	N=2
		15

N20-21 W1-2 Lev. 3 Stratum 2b

A-16-C-1	Tecovas flakes (9 burned)	N=21
A-16-C-2	Tecovas core remnant	N=1
		20

N20-21 W1-2 Lev. 4 Stratum 2b

A-16-D-1	Jornada Brownware olla sherd	N=1
A-16-D-2	Mussel shell	N=2
A-16-D-3	Potter chert flakes	N=4
A-16-D-4	Tecovas core remnant	N=1
A-16-D-5	Quartzite chopper	N=1
A-16-D-6	Tecovas flakes (42 burned)	N=102
A-16-D-7	Alibates flake	N=1
A-16-D-8	Tecovas biface fragment	N=1
A-16-D-9	Unidentified material flake	N=1
A-16-D-10	*Graphia shell	N=1
A-16-D-11	Roswell Brownware olla sherd	N=1
A-16-D-12	Tecovas core	N=1
		116

N20-21 W1-2 Lev.5 Stratum 2b

A-16-E-1	Tecovas flakes (13 burned)	N=38
A-16-E-2	Potter chert flakes (2 burned)	N=5
A-16-E-3	*Graphia shell	N=1
A-16-E-4	Vertebrata fragments (1 burned)	N=3
A-16-E-5	Tecovas side scraper	N=1
A-16-E-6	Petrified wood core	N=1
		48

20-21 W1-2 Lev. 6 Stratum 2c

A-16-F-1	Tecovas flakes (13 burned)	N=35
A-16-F-2	Potter chert flake	N=1
A-16-F-3	Petrified wood chunk	N=1
A-16-F-4	Vertebrata fragment (burned)	N=1
		38

N20-21 W1-2 Lev. 7 Stratum 2c

A-16-G-1	Tecovas flakes	N=8
A-16-G-2	Potter chert flakes (2 burned)	N=3
A-16-G-3	Tecovas retouched flake	N=1
		12

N22-23 W0-1 Lev. 1 Stratum 1

A-17-A-1	Serpentes (snake) vertebral fragments	N=2
A-17-A-2	Tecovas flake	N=1
		3

N22-23 W0-1 Lev. 2 Stratum 2a

A-17-B-1	Tecovas flakes (28 burned)	N=45
A-17-B-2	Potter chert flakes	N=10
A-17-B-3	Mussel shell fragment	N=1
A-17-B-4	Large mammal enamel tooth fragment	N=1
A-17-B-5	Tecovas biface (2 pieces--burned)	N=1
		58

N22-23 W0-1 Lev. 3 Stratum 2b

A-17-C-1	Tecovas flakes (18 burned)	N=50
A-17-C-2	Potter chert flakes	N=6
A-17-C-3	Tecovas biface fragment	N=1
A-17-C-4	*Charcoal sample	N=1
A-17-C-5	Vertebrata fragment	N=1
A-17-C-6	Mussel shell fragment	N=1
A-17-C-7	Alibates flake	N=1
		60

N22-23 W0-1 Lev. 4 Stratum 2b

A-17-D-1	Tecovas flakes (18 burned)	N=37
A-17-D-2	Tecovas core remnant	N=1
A-17-D-3	Potter chert flakes	N=6
A-17-D-4	Alibates flake	N=1
A-17-D-5	Petrified wood flake	N=1
		46

N18-19 W0-1 Lev. 1 Stratum 1

A-18-A-1	Tecovas flakes (11 burned)	N=20
A-18-A-2	Vertebrata fragment	N=1
A-18-A-3	Potter chert flake	N=1
		22

N18-19 W0-1 Lev. 2 Stratum 2a

A-18-B-1	Tecovas flakes (7 burned)	N=65
A-18-B-2	*Graphia shell	N=1
A-18-B-3	Potter chert flake	N=1
A-18-B-4	Tecovas side scraper fragment	N=1
A-18-B-5	Mussel shell fragment	N=1
A-18-B-6	Large mammal enamel tooth fragment	N=1
	Medium/Large mammal fragment (burned)	N=1
A-18-B-7	Alibates flake	N=1
A-18-B-8	Tecovas core	N=1
		72

N18-19 W0-1 Lev. 3 Stratum 2b

A-18-C-1	Tecovas flakes (4 burned)	N=58
A-18-C-2	Potter chert flakes	N=10
		68

N20-21 W0-1 Lev. 1 and 2 Strata 1 and 2a

A-19-A&B-1	Tecovas flakes (10 burned)	N=28
A-19-A&B-3	Tecovas retouched flake	N=1
A-19-A&B-4	Tecovas flake scraper	N=1
		30

N20-21 W0-1 Lev. 3 Stratum 2b

A-19-C-1	Vertebrata fragments	N=11
A-19-C-2	Tecovas flakes (28 burned)	N=64
A-19-C-3	Tecovas biface fragment	N=1
A-19-C-4	*Graphia shell	N=1
A-19-C-5	Tecovas dart point tip	N=1
A-19-C-6	Jornada Brownware sherd	N=1
A-19-C-7	Petrified wood knife	N=1
A-19-C-8	Potter chert flakes	N=9
		88

N20-21 W0-1 Lev. 4 Stratum 2b

A-19-D-1	Tecovas flakes (9 burned)	N=35
A-19-D-2	Tecovas core	N=1
A-19-D-3	Alibates flakes (1 burned)	N=3
A-19-D-4	Pigment rock (?)	N=1
		40

N20-21 W0-1 Lev. 5 Stratum 2b

A-19-E-1	Tecovas flakes (6 burned)	N=17
A-19-E-2	Potter chert flakes	N=2
A-19-E-3	Quartzite flake	N=1
		20

N20-21 W0-1 Lev. 6 Stratum 2c

A-19-F-1	Tecovas flakes (5 burned)	N=12
A-19-F-2	Potter chert flakes (burned)	N=3
		15

N20-21 W2-3 Lev. 1 Stratum 1

A-20-A-1	Potter chert flake	N=1
A-20-A-2	Petrified wood flake	N=1
A-20-A-3	Tecovas flakes	N=5
		7

N20-21 W2-3 Lev. 3 Stratum 2b

A-20-C-1	Tecovas flakes (17 burned)	N=47
A-20-C-2	Potter chert flakes	N=5
		52

N20-21 W2-3 Lev. 4 Stratum 2c

A-20-D-1	Jornada Brownware sherd	N=1
A-20-D-2	Mussel shell fragments	N=2
A-20-D-3	*Graphia shell	N=1
A-20-D-4	Vertebrata fragment (burned)	N=1
A-20-D-5	Potter chert flakes	N=4
A-20-D-6	Burned Tecovas core remnants	N=2
A-20-D-7	Tecovas flakes (59 burned)	N=101
A-20-D-8	Tecovas side scraper fragment (burned)	N=1
		112

N20-21 W2-3 Lev. 5 Stratum 2b

A-20-E-1	Tecovas flakes (10 burned)	N=31
A-20-E-2	Potter chert flakes (1 burned)	N=4
A-20-E-3	Alibates flake	N=1
		36

N20-21 W2-3 Lev. 6 Stratum 2c

A-20-F-1	Tecovas flakes (9 burned)	N=23
A-20-F-2	Potter chert flakes (2 burned)	N=4
A-20-F-3	Petrified wood flake	N=1
		28

N20-21 W3-4 Lev. 2 Stratum 2a

A-21-B-1	Tecovas flakes (17 burned)	N=27
A-21-B-2	*Graphia shell	N=1
A-21-B-3	Potter chert core	N=1
A-21-B-4	Middle Pecos Micaceous Brown sherd	N=1
A-21-B-5	Edwards side scraper fragment	N=1
		30

N20-21 W3-4 Lev.3 Stratum 2b

A-21-C-1	Tecovas flakes (11 burned)	N=33
A-21-C-2	Potter Chert flakes	N=5
A-21-C-3	Tecovas arrowpoint midsection	N=1
		39

N20-21 W3-4 Lev. 4 Stratum 2b

A-21-D-1	Vertebrate fragments (burned)	N=2
A-21-D-2	Jornada Brownware sherd	N=1
A-21-D-3	Petrified wood flakes	N=2
A-21-D-4	Obsidian flake	N=1
A-21-D-5	Potter chert flakes	N=3
A-21-D-6	Alibates flakes	N=4
A-21-D-7	Tecovas flakes (37 burned)	N=92
		105

N20-21 W3-4 Lev. 5 Stratum 2b

A-21-E-1	Tecovas flakes (23 burned)	N=67
A-21-E-2	Potter chert core remnant	N=1
A-21-E-3	Potter chert flakes	N=3
A-21-E-4	Vertebrate fragment	N=1
A-21-E-5	Tecovas core remnant	N=1
		73

N20-21 W4-5 Lev. 1 Stratum 1

A-22-A-1	Tecovas flakes (4 burned)	N=9
A-22-A-2	Potter chert flake	N=1
		10

N20-21 W4-5 Lev. 2 Stratum 2a

A-22-B-1	Tecovas flakes (2 burned)	N=24
A-22-B-2	*Graphia shell	N=1
A-22-B-3	Potter chert flakes	N=3
A-22-B-4	Medium/Large mammal podial	N=1
	Vertebrata fragments	N=5
A-22-B-5	Artiodactyla right astragalus	N=1
A-22-B-6	Tecovas core	N=1
		35

N20-21 W4-5 Lev.3 Stratum 2b

A-22-C-1	Jornada Brownware sherd	N=1
A-22-C-2	Vertebrata fragment	N=1
A-22-C-3	Tecovas arrowpoint barb	N=1
A-22-C-4	Alibates flakes	N=5
A-22-C-5	Tecovas flakes (20 burned)	N=94
A-22-C-6	Potter chert flakes (2 burned)	N=9
A-22-C-8	Tecovas biface fragment	N=1
		112

N20-21 W4-5 Lev. 4 Stratum 2b

A-22-D-1	Medium/Large mammal fragment	N=1
	Vertebrata fragments (1 burned)	N=3
A-22-D-2	Tecovas end scraper fragment	N=1
A-22-D-3	Mussel shell fragment	N=1
A-22-D-4	Alibates flake	N=1
A-22-D-5	Opaline flakes	N=3
A-22-D-6	Tecovas flakes (29 burned)	N=120
A-22-D-7	Potter chert flakes (4 burned)	N=11
		141

N20-21 W4-5 Lev. 5 Stratum 2b

A-22-E-1	Tecovas flakes (21 burned)	N=39
A-22-E-2	Petrified wood flake	N=1
A-22-E-3	Potter chert flake	N=1
A-22-E-4	Vertebrata fragments (1 burned)	N=4
		45

N20-21 W4-5 Lev. 6 Stratum 2c

A-22-F-1	Potter chert flakes	N=3
A-22-F-2	Vertebrata fragment	N=1
A-22-F-3	Petrified wood flakes	N=2
A-22-F-4	Tecovas flakes (5 burned)	N=28
A-22-F-5	*Graphia shell	N=1
A-22-F-6	Tecovas dart point tip	N=1
		35

N20-21 W5-6 Lev. 1 Stratum 1

A-23-A-1	Tecovas arrowpoint tip	N=1
A-23-A-2	Vertebrata fragments	N=2
A-23-A-3	Opaline flakes	N=2
A-23-A-4	Alibates flake	N=1
A-23-A-5	Potter chert flakes	N=3
A-23-A-6	Tecovas flakes (6 burned)	N=27
A-23-A-7	Tecovas core	N=1
		37

N20-21 W5-6 Lev. 2 Stratum 2a

A-23-B-1	Tecovas flakes (7 burned)	N=29
A-23-B-2	Potter chert flakes (1 burned)	N=3
A-23-B-3	Tecovas Ellis dart point base	N=1
A-23-B-4	Alibates flake	N=1
A-23-B-5	Quartzite flake	N=1
		35

N20-21 W5-6 Lev.3 Stratum 2b

A-23-C-1	Opaline flakes	N=3
A-23-C-2	Potter chert flakes (2 burned)	N=8
A-23-C-3	Tecovas flakes (23 burned)	N=79
A-23-C-4	*Graphia shell	N=1
A-23-C-5	*Charcoal sample	N=1
A-23-C-6	Vertebrata fragments (burned)	N=2
A-23-C-7	Alibates flakes (1 burned)	N=2
A-23-C-8	Edwards chert flake	N=1
A-23-C-9	Jornada Brownware sherd	N=1
A-23-C-10	Tecovas arrowpoint preform base	N=1
A-23-C-11	Tecovas Scallorn arrowpoint	N=1
		98

N20-21 W5-6 Lev. 4 Stratum 2b

A-23-D-1	Tecovas arrowpoint tip	N=1
A-23-D-2	Tecovas arrowpoint tang	N=1
A-23-D-3	Quartzite Mano	N=1
A-23-D-4	Petrified wood flake	N=1
A-23-D-5	Edwards chert flake	N=1
A-23-D-6	Potter chert flakes	N=5
A-23-D-7	Tecovas flakes (29 burned)	N=94
A-23-D-8	Artiodactyla metapodial fragment	N=1
	Large mammal enamel tooth fragment	N=1
	Vertebrata fragments (3 burned)	N=6
		112

N21-22 W4-5 Lev. 2 Stratum 2a

A-24-B-1	Tecovas flakes (6 burned)	N=27
A-24-B-2	Petrified wood flakes	N=2
A-24-B-3	Potter chert flake	N=1
A-24-B-4	Quartzite flake	N=1
A-24-B-5	*Graphia shell	N=1
		32

N21-22 W4-5 Lev. 3 Stratum 2b

A-24-C-1	Tecovas flakes (46 burned)	N=81
A-24-C-2	Potter chert flakes (5 burned)	N=14
A-24-C-3	Mussel shell fragments	N=2
A-24-C-4	Vertebrata fragments (4burned)	N=7
A-24-C-5	Tecovas core	N=1
		105

N22-23 W4-5 Lev. 4 Stratum 2b

A-24-D-1	Tecovas flakes (63 burned)	N=98
A-24-D-2	Tecovas core	N=1
A-24-D-3	Quartzite flake	N=1
A-24-D-4	Alibates flake	N=1
A-24-D-5	Potter chert flakes	N=7
A-24-D-6	*Charcoal sample	N=1
A-24-D-7	Artiodactyla left scaphoid (carpal)	N=1
	Vertebrata fragments (1 burned)	N=6
		115

N21-22 W4-5 Lev. 5 Stratum 2b

A-24-E-1	Tecovas flakes (11 burned)	N=40
A-24-E-2	Edwards chert flake	N=1
A-24-E-3	Potter chert flake	N=3
A-24-E-4	Mussel shell fragment	N=1
		45

N18-19 W7-8 Lev. 1 Stratum 1

A-25-A-1	Tecovas flakes (13 burned)	N=33
A-25-A-2	Alibates flake	N=1
A-25-A-3	Vertebrata fragment	N=1
		35

N18-19 W7-8 Lev. 2 Stratum 2a

A-25-B-1	Tecovas flakes (39 burned)	N=90
A-25-B-2	Alibates flakes	N=4
A-25-B-3	Potter chert flakes	N=3
A-25-B-4	Tecovas Ellis dart point stem	N=1
A-25-B-5	Medium/Large mammal enamel tooth fragments	N=2
	Vertebrata long bone fragment (small animal)	N=1
	Vertebrata fragments	N=2
		103

N18-19 W7-8 Lev.3 Stratum 2b

A-25-C-1	Jornada Brownware sherd	N=1
A-25-C-2	Tecovas flakes (28 burned)	N=112
A-25-C-3	Vertebrata fragments (1 burned)	N=8
A-25-C-4	Potter chert flakes	N=9
A-25-C-5	Alibates flakes	N=4
		134

N18-19 W7-8 Lev. 4 Stratum 2b

A-25-D-1	Tecovas Deadman arrowpoint	N=1
A-25-D-2	Tecovas unidentified arrowpoint	N=1
A-25-D-3	Tecovas arrowpoint tang	N=1
A-25-D-4	Tecovas arrowpoint preform (tip missing)	N=1
A-25-D-5	Tecovas arrowpoint preform (tip missing)	N=1
A-25-D-6	Petrified wood end scraper fragment	N=1
A-25-D-7	Petrified wood flakes	N=2
A-25-D-8	Alibates flakes	N=2
A-25-D-9	Tecovas flakes (20 burned)	N=81
A-25-D-10	Medium/Large mammal fragments	N=3
	Vertebrata fragments (3 burned)	N=7
A-25-D-11	Potter chert flakes (5 burned)	N=11
A-25-D-12	Sandstone Mano fragment	N=1
A-25-D-13	Sandstone Mano (bifacial)	N=1
A-25-D-14	Tecovas biface fragment	N=1
A-25-D-15	Tecovas core	N=1
		116

N18-19 W7-8 Lev. 5 Stratum 2b

A-25-E-1	Artiodactyla right unciform (carpal)	N=1
	Small mammal long bone articular end	N=1
	Vertebrata long bone frags. (small animal)	N=2
	Vertebrata fragments (4 burned)	N=11
A-25-E-2	Tecovas biface midsection	N=1
A-25-E-3	Tecovas biface fragment (burned)	N=1
A-25-E-4	Quartzite flake	N=1
A-25-E-5	Tecovas flakes (26 burned)	N=83
A-25-E-6	Potter chert flakes	N=4
		105

N18-19 W7-8 Lev. 6 Stratum 2c

A-25-F-1	Rodentia incisor (small rodent)	N=1
A-25-F-2	Vertebrata fragments (2 burned)	N=4
A-25-F-4	Tecovas flakes (18 burned)	N=49
A-25-F-4	Potter chert flakes	N=2
A-25-F-5	Gastropod shells	N=16
		72

N25-26 W4-5 Lev. 1 Stratum 1

A-26-A-1	Tecovas flakes (14 burned)	N=31
A-26-A-2	Tecovas core remnants (burned)	N=2
A-26-A-3	Tecovas retouched flakes	N=2
A-26-A-4	Tecovas flake scraper fragment	N=1
		36

N25-26 W4-5 Lev. 2 Stratum 2a

A-26-B-1	Tecovas flakes (19 burned)	N=37
A-26-B-2	Tecovas core remnant	N=1
A-26-B-3	Tecovas retouched flake	N=1
A-26-B-4	Roswell Brownware sherd	N=2
A-26-B-5	Potter chert flake (burned)	N=1
A-26-B-6	Alibates flakes	N=2
		44

N28-29 W11-12 Lev. 1 Stratum 1

A-27-A-1	Tecovas flakes (5 burned)	N=41
		41

N28-29 W11-12 Lev. 2 Stratum 2a

A-27-B-1	Tecovas flakes (40 burned)	N=141
A-27-B-2	Potter chert flakes	N=2
A-27-B-3	Mussel shell fragment	N=1
A-27-B-4	Tecovas biface fragment	N=1
		145

N28-29 W 11-12 Lev. 3 Stratum 2b

A-27-C-1	Tecovas flakes (10 burned)	N=38
A-27-C-2	Potter chert core remnant	N=1
A-27-C-3	Potter chert flake	N=1
A-27-C-4	Tecovas scraper bit	N=1
A-27-C-5	Tecovas retouched flake	N=1
A-27-C-6	Tecovas flake scraper fragment	N=1
A-27-C-7	Tecovas biface fragment	N=1
		44

N18-19 W8-9 Lev. 1 Stratum 1

A-28-A-1	Tecovas arrowpoint stem	N=1
A-28-A-2	Potter chert flakes	N=4
A-28-A-3	Tecovas flakes (2 burned)	N=32
		37

N18-19 W8-9 Lev. 2 Stratum 2a

A-28-B-1	Tecovas flakes (15 burned)	N=54
A-28-B-2	Tecovas knife fragment (burned)	N=1
A-28-B-3	Potter chert flakes	N=5
A-28-B-4	Petrified Wood flake	N=1
		61

N18-19 W8-9 Lev. 3 Stratum 2b

A-28-C-1	Tecovas side scraper	N=1
A-28-C-2	Alibates retouched flake	N=1
A-28-C-3	Alibates flakes (2 burned)	N=3
A-28-C-4	Potter chert flake	N=1
A-28-C-5	Tecovas flakes (2 burned)	N=81
A-28-C-6	Tecovas retouched flake (burned)	N=1
A-28-C-7	Tecovas retouched flake	N=1

A-28-C-8	Vertebrata fragment (burned)	N=1
A-28-C-9	Mussel shell fragment	N=2
		92

N18-19 W8-9 Lev. 4 Stratum 2b

A-28-D-1	Tecovas flakes (36 burned)	N=87
A-28-D-2	Potter chert flakes (3 burned)	N=6
A-28-D-3	Mussel shell fragments	N=3
A-28-D-4	Large mammal enamel tooth fragment	N=1
A-28-D-5	Large mammal fragment	N=1
	Vertebrata fragments (3 burned)	N=11
A-28-D-6	*Graphia shell fragment	N=1
A-28-D-7	Ochre (burned)	N=1
		110

N18-19 W8-9 Lev. 5 Stratum 2b

A-28-E-1	Tecovas flakes (13 burned)	N=31
A-28-E-2	Mussel shell fragments	N=2
		33

N18-19 W8-9 Lev. 6 Stratum 2c

A-28-F-1	Tecovas flakes (10 burned)	N=19
A-28-F-2	Petrified wood flake	N=1
A-28-F-3	Large mammal long bone fragment	N=1
	Vertebrata fragment (burned)	N=1
		22

N18-19 W9-10 Lev.1 Stratum 1

A-29-A-1	Jornada Brownware sherd	N=1
A-29-A-2	Tecovas Scallorn arrowpoint	N=1
A-29-A-3	Quartzite flake	N=1
A-29-A-4	Potter chert flake	N=1
A-29-A-5	Tecovas flakes (9 burned)	N=56
		60

N18-19 W9-10 Lev. 3 Stratum 2b

A-29-C-1	Obsidian flake	N=1
A-29-C-2	Mussel shell fragments	N=2
A-29-C-3	Tecovas biface fragment	N=1
A-29-C-4	Potter chert flakes	N=6
A-29-C-5	Tecovas flakes (45 burned)	N=91
A-29-C-6	Tecovas core	N=1
		102

N18-19 W9-10 Lev. 4 Stratum 2b

A-29-D-1	Vertebrata fragments	N=2
A-29-D-2	Potter chert flakes (burned)	N=3
A-29-D-3	Tecovas flakes (13 burned)	N=52
A-29-D-6	Alibates flake	N=1
A-29-D-7	Tecovas arrowpoint fragment	N=1
A-29-D-8	Tecovas core	N=1
		60

N17-18 W8-9 Lev. 2 Stratum 2a

A-30-B-1	Tecovas flakes (33 burned)	N=72
A-30-B-2	Tecovas flake scraper fragment	N=1
A-30-B-3	Mussel shell fragment	N=1
A-30-B-4	Vertebrata fragments	N=2
		76

N17-18 W8-9 Lev. 3 Stratum 2b

A-30-C-1	Roswell Brownware olla sherd	N=1
A-30-C-2	Edwards chert flake	N=1
A-30-C-3	Potter chert flakes (1 burned)	N=6
A-30-C-4	Tecovas flakes (57 burned)	N=112
A-30-C-5	Petrified wood flake (burned)	N=1
		121

N17-18 W8-9 Lev. 4 Stratum 2b

A-30-D-1	Jornada Brownware sherd	N=1
A-30-D-2	Edwards chert end scraper	N=1
A-30-D-3	Alibates flakes	N=3
A-30-D-4	Potter chert flakes	N=2
A-30-D-5	Vertebrata fragments	N=2
A-30-D-6	Tecovas flakes (22 burned)	N=77
A-30-D-7	*Charcoal2472Hsample	N=1
A-30-D-8	Sandstone Metate fragment	N=1
		87

N17-18 W8-9 Lev. 5 Stratum 2b

A-30-E-1	*Charcoal sample	N=1
A-30-E-2	Roswell Brownware sherd	N=1
A-30-E-3	Potter chert flakes (1 burned)	N=4
A-30-E-4	Tecovas Scallorn arrowpoint fragment	N=1
A-30-E-5	Vertebrata fragments (1 burned)	N=2
A-30-E-6	Tecovas flakes (27 burned)	N=71
A-30-E-7	Tecovas biface fragment	N=1
A-30-E-8	Edwards chert flake	N=1
A-30-E-9	Dakota Quartzite flakes	N=2
A-30-E-10	Tecovas drill base	N=1
A-30-E-11	Tecovas side scraper fragment	N=1
A-30-E-12	Tecovas cores	N=2
		87

N17-18 W9-11 Lev. 1 Stratum 1

A-31-A-1	Tecovas flakes (5 burned)	N=16
A-31-A-2	Vertebrata fragment (burned)	N=1
		17

N18-20 W10-12 Lev. 1 Stratum 1

A-32-A-1	Tecovas flakes (7 burned)	N=62
A-32-A-2	Petrified wood flake	N=1
A-32-A-3	Tecovas arrowpoint preform (tip missing)	N=1
		64

N18-20 W10-12 Lev. 2 Stratum 2a

A-32-B-1	Obsidian flake	N=1
A-32-B-2	Dakota Quartzite flake	N=1
A-32-B-3	Petrified wood flakes	N=3
A-32-B-4	Potter chert flakes	N=15
A-32-B-5	Alibates flakes (3 burned)	N=15
A-32-B-6	Jornada Brownware sherd	N=1
A-32-B-7	Tecovas Ellis dart point	N=1
A-32-B-8	Tecovas arrowpoint stem	N=1
A-32-B-9	Tecovas flake scraper fragment	N=1
A-32-B-10	Alibates side scraper fragment	N=1
A-32-B-11	Tecovas arrowpoint tip	N=1
A-32-B-12	Tecovas arrowpoint preform (tip missing)	N=1
A-32-B-13	Tecovas biface fragment	N=1
A-32-B-14	Tecovas flakes (75 burned)	N=445
A-32-B-15	Mussel shell fragments	N=7
A-32-B-16	Tecovas cores	N=2
		497

N18-20 W10-12 Lev. 3 Stratum 2b

A-32-C-1	Roswell Brownware sherd	N=1
A-32-C-2	Potter chert flakes	N=3
A-32-C-3	Edwards chert flake	N=1
A-32-C-4	Vertebrata fragment	N=1
A-32-C-5	Petrified wood flake	N=1
A-32-C-6	Tecovas flakes (21 burned)	N=89
A-32-C-7	*Graphia shell	N=1
A-32-C-8	Roswell Brownware sherd	N=1
		97

N18-20 W6-7 Lev. 1 Stratum 1

A-33-A-1	Tecovas flakes (4 burned)	N=24
A-33-A-2	Potter chert flake	N=1
A-33-A-3	Petrified wood flakes	N=2
		27

N18-20 W6-7 Lev. 2 Stratum 2a

A-33-B-1	Tecovas flakes (6 burned)	N=84
A-33-B-2	Alibates flakes (2 burned)	N=13
A-33-B-3	Potter chert flakes	N=3
A-33-B-4	Petrified wood flake	N=1
A-33-B-5	Tecovas arrowpoint preform	N=1
A-33-B-6	Tecovas arrowpoint midsecton	N=1
		103

N18-20 W6-7 Lev. 3 Stratum 2b

A-33-C-1	Tecovas arrowpoint tip	N=1
A-33-C-2	Mussel shell	N=1
A-33-C-3	Tecovas arrowpoint stem	N=1
A-33-C-4	Obsidian flake	N=1
A-33-C-5	Alibates flakes	N=8
A-33-C-6	Potter chert flakes (7 burned)	N=20
A-33-C-7	Opaline flakes	N=5
A-33-C-8	*Charcoal sample	N=1
A-33-C-9	Tecovas arrowpoint preform (tip missing)	N=1
A-33-C-10	Tecovas arrowpoint preform	N=1
A-33-C-11	Vertebrata fragments (1 burned)	N=4
A-33-C-12	Tecovas flakes (61 burned)	N=308
		351

N18-20 W6-7 Lev. 4 Stratum 2b

A-33-D-1	*Charcoal sample	N=1
A-33-D-2	Obsidian flake	N=1
A-33-D-3	*Graphia shell	N=1
A-33-D-4	Edwards chert flake	N=1
A-33-D-5	Tecovas arrowpoint preform (tip missing)	N=1
A-33-D-6	Mussel shell (1 burned)	N=3
A-33-D-7	Edwards chert Scallorn arrowpoint (Fe. 5)	N=1
A-33-D-8	Tecovas arrowpoint preform (tip missing)	N=1
A-33-D-9	Petrified wood flake	N=1
A-33-D-10	Burned Alibates flakes	N=2
A-33-D-11	Potter chert flakes (9 burned)	N=20
A-33-D-12	Tecovas flakes	N=213
A-33-D-13	*Charcoal sample	N=1
A-33-D-14	Tecovas core fragment	N=1
A-33-D-15	Skunk left calcaneus	N=1
	Hard-shell Turtle left carapace plate	N=2
A-33-D-16	Vertebrata fragments (13 burned)	N=20
A-33-D-17	Sandstone Mano fragment	N=1
A-33-D-18	Quartzite Mano fragment	N=1
A-33-D-19	Quartzite hammerstone	N=1
A-33-D-20	Tecovas cores	N=6
		277

N18-20 W6-7 Lev. 5 Stratum 2b

A-33-E-1	Alibates arrowpoint tip	N=1
A-33-E-2	Potter chert flakes (1 burned)	N=7
A-33-E-3	Petrified wood flakes	N=2
A-33-E-4	Quartzite flake	N=1
A-33-E-5	Opaline flake	N=1
A-33-E-6	Tecovas flakes (29 burned)	N=113
A-33-E-7	*Charcoal sample	N=1
A-33-E-8	Vertebrata fragments (4 burned)	N=10
A-33-E-9	Mussel shell (1 burned)	N=2
		138

N18-20 W6-7 Lev. 6 Stratum 2c

A-33-F-1	Tecovas biface fragment (fits A-36-D-1)	N=1
A-33-F-2	Tecovas flakes (14 burned)	N=117
A-33-F-3	Petrified wood flake	N=1
A-33-F-4	Tecovas core	N=1
A-33-F-5	Potter chert flakes	N=8
A-33-F-6	Medium/Large mammal spinous process	N=1
	Medium/Large mammal fragment	N=1
	Vertebrata fragments (3 burned)	N=12
A-33-F-7	*Graphia shell	N=1
A-33-F-8	Alibates flake	N=1
A-33-F-9	Tecovas side scraper fragment	N=1
A-33-F-10	Alibates retouched flake	N=1
A-33-F-11	Large mammal long bone fragment	N=1
A-33-F-12	Vertebrata fragment	N=1
A-33-F-13	Tecovas retouched flake	N=1
A-33-F-14	Roswell Brownware sherd	N=1
		149

N18-20 E0-1 Lev. 1 Stratum 1

A-34-A-1	Tecovas flakes (6 burned)	N=27
A-34-A-2	Quartzite flakes	N=3
A-34-A-3	Potter chert flakes	N=3
		33

N18-20 E0-1 Lev. 2 Stratum 2a

A-34-B-1	Tecovas arrowpoint tip	N=1
A-34-B-2	Petrified wood flake	N=1
A-34-B-3	Potter chert flakes (3 burned)	N=5
A-34-B-4	Alibates flakes (3 burned)	N=4
A-34-B-5	Mussel shell	N=2
A-34-B-6	Tecovas flakes (10 burned)	N=77
		90

N19-20 E1-2 Lev. 1 Stratum 1

A-35-A-1	Tecovas flakes (13 burned)	N=22
		22

N19-20 E1-2 Lev. 2 Stratum 2a

A-35-B-1	Tecovas flakes (13 burned)	N=23
		23

N21-22 W0-2 Levels 1 & 2 Strata 1 & 2a

A-36-A&B-1	Tecovas flakes	N=121
A-36-A&B-2	Burned Tecovas flakes	N=69
A-36-A&B-3	Potter chert flakes	N=15
A-36-A&B-4	Tecovas retouched flake	N=1
A-36-A&B-5	Alibates flakes (burned)	N=5
A-36-A&B-6	Petrified wood flakes	N=2
A-36-A&B-7	Edwards chert flake	N=1
A-36-A&B-8	Tecovas cores	N=2
A-36-A&B-9	Vertebrata fragments (1 burned)	N=4
A-36-A&B-10	Mussel shell fragment	N=1
		221

N21-22 W0-2 Lev. 3 Stratum 2b

A-36-C-1	Tecovas flakes (18 burned)	N=49
A-36-C-2	Potter chert flakes	N=3
A-36-C-3	Tecovas side scraper	N=1
A-36-C-4	Tecovas crude biface	N=1
		54

N21-22 W0-2 Lev. 4 Stratum 2b

A-36-D-1	Tecovas biface fragment (fits A-33-F-1)	N=1
A-36-D-2	Tecovas flakes (43 burned)	N=106
A-36-D-3	Potter chert flakes	N=3
A-36-D-4	Petrified wood flakes	N=2
A-36-D-5	Vertebrata fragments (1 burned)	N=3
A-36-D-6	Potter chert core	N=1
		116

N21-22 W0-2 Lev. 5 Stratum 2b

A-36-E-1	Middle Pecos Micaceous Brownware sherd	N=1
A-36-E-2	Vertebrata fragments (1 burned)	N=3
A-36-E-3	Alibates flakes	N=3
A-36-E-4	Opaline flake	N=1
A-36-E-5	Potter chert flakes	N=7
A-36-E-6	Tecovas flakes (31 burned)	N=115
A-36-E-7	Mussel shell	N=2
		132

N21-22 W0-2 Lev. 6 Stratum 2c

A-36-F-1	Jornada Brownware sherd	N=1
A-36-F-2	Vertebrata long bone fragment	N=1
	Vertebrata fragments	N=6
A-36-F-3	Potter chert flakes	N=6
A-36-F-4	Alibates core	N=1
A-36-F-5	Sandstone Metate fragment	N=1
A-36-F-6	Tecovas flakes (25 burned)	N=82
		98

N21-22 W2-4 Lev. 3 Stratum 2b

A-37-C-1	Tecovas flakes (20 burned)	N=54
A-37-C-2	Tecovas core remnant	N=1
A-37-C-3	Potter chert flakes	N=4
A-37-C-4	Petrified wood flakess	N=2
A-37-C-5	Tecovas knife fragment	N=1
A-37-C-6	Edwards chert flake	N=1
A-37-C-7	Alibates flake	N=1
		64

N21-22 W2-4 Lev. 4 Stratum 2b

A-37-D-1	Tecovas flakes (61 burned)	N=151
A-37-D-2	Petrified wood flakes	N=4
A-37-D-3	Potter chert flakes	N=14
A-37-D-4	Edwards chert flaks	N=2
A-37-D-5	Gastropod shells	N=13
A-37-D-6	*Graphia shell	N=1
A-37-D-7	*Charcoal sample	N=1
A-37-D-8	Potter chert gouge	N=1
A-37-D-9	Tecovas unidentified arrowpoint	N=1
		186

N21-22 W2-4 Lev. 5 Stratum 2b

A-37-E-1	Tecovas flakes (76 burned)	N=267
A-37-E-2	*Graphia shell	N=1
A-37-E-3	*Charcoal sample	N=1
A-37-E-4	Alibates flakes (2 burned)	N=7
A-37-E-5	Tecovas biface fragment	N=1
A-37-E-6	Potter chert chopper	N=1
A-37-E-7	Potter chert flakes	N=17
A-37-E-8	Opaline flakes	N=1
A-37-E-9	Tecovas biface fragment	N=1
A-37-E-10	Artiodactyla left femur, lateral condyle	N=1
	Large mammal fragment	N=1
A-37-E-11	Vertebrata fragments (5 burned)	N=19
A-37-E-12	Edwards chert flake	N=1
A-37-E-13	Petrified wood flakes	N=2
		319

N22-24 W2-4 Lev. 2 Stratum 2a

A-38-B-1	Alibates Ellis dart point base	N=1
		1

N19-20 W3-5 Lev. 1 Stratum 1

A-39-A-1	Tecovas unidentified arrowpoint	N=1
A-39-A-2	Tecovas biface fragment	N=1
A-39-A-3	Quartzite flake	N=1
A-39-A-4	Potter chert flakes	N=6
A-39-A-5	Tecovas flakes (33 burned)	N=67
A-39-A-6	Tecovas core	N=1
		77

N19-20 W3-5 Lev. 2 Stratum 2a

A-39-B-1	Tecovas flakes (57 burned)	N=118
A-39-B-2	*Graphia shell	N=1
A-39-B-3	Potter chert flakes	N=9
A-39-B-4	Tecovas core	N=1
A-39-B-5	Vertebrata fragment	N=1
A-39-B-6	Alibates flakes	N=2
A-39-B-7	Flakes-unidentified material	N=3
A-39-B-8	Mussel shell fragment	N=1
		135

N19-20 W3-5 Lev. 3 Stratum 2b

A-39-C-1	Mussel shell fragment	N=1
A-39-C-2	Medium/Large mammal fragment	N=1
	Vertebrata fragments	N=2
A-39-C-3	Tecovas flake scraper	N=1
A-39-C-4	Tecovas biface fragment	N=1
A-39-C-5	Tecovas arrowpoint preform (notched base)	N=1
A-39-C-6	Potter chert flakes	N=13
A-39-C-7	Petrified wood flakes	N=2
A-39-C-8	Daub (burned)	N=1
A-39-C-9	Tecovas flakes (60 burned)	N=120
A-39-C-10	Alibates flakes	N=4
		147

N19-20 W3-5 Lev. 4 Stratum 2b

A-39-D-1	Tecovas flakes (22 burned)	N=67
A-39-D-2	*Charcoal sample	N=1
A-39-D-3	Petrified wood flake	N=1
A-39-D-4	Mussel shell	N=1
A-39-D-5	Daub (w/stick impression--burned)	N=1
A-39-D-6	Potter chert chopper	N=1
		71

N19-20 W3-5 Lev. 5 Stratum 2b

A-39-E-1	Tecovas flakes (14 burned)	N=34
A-39-E-2	Gastropod shell	N=1
A-39-E-3	Alibates flakes	N=2
A-39-E-4	Potter chert flakes	N=2
A-39-E-5	Edwards chert flake	N=1
A-39-E-6	Petrified wood flake	N=1
A-39-E-7	Tecovas Ellis dart point stem	N=1
A-39-E-8	Tecovas arrowpoint preform (tip missing)	N=1
		43

N17-18 W7-8 Lev. 1 Stratum 1

A-40-A-1	Tecovas flakes (13 burned)	N=31
		31

N17-18 W7-8 Lev. 2 Stratum 2a

A-40-B-1	Tecovas flakes (29 burned)	N=60
A-40-B-2	*Graphia shell	N=1
A-40-B-3	Potter chert flakes	N=3
A-40-B-4	Petrified wood core	N=1
A-40-B-5	Medium/Large mammal fragment	N=1
A-40-B-6	Red ochre	N=1
A-40-B-7	Opaline flake	N=1
		67

17-18 W7-8 Lev. 3 Stratum 2b

A-40-C-1	Tecovas flakes (27 burned)	N=73
A-40-C-2	Potter chert flakes	N=4
A-40-C-3	Alibates flakes	N=3
		80

N17-18 W7-8 Lev. 4 Stratum 2b

A-40-D-1	Tecovas flakes (48 burned)	N=95
A-40-D-2	Gastropod shell	N=1
A-40-D-3	*Charcoal sample	N=1
A-40-D-4	Potter chert flakes	N=3
A-40-D-5	Edwards chert flakes	N=2
A-40-D-6	Vertebrata long bone (subadult)	N=1
A-40-D-7	Mussel shell	N=1
A-40-D-8	Subadult Skunk right premaxilla	N=1
A-40-D-9	Gastropod shell	N=1
A-40-D-10	Metate fragment	N=1
		106

N17-18 W7-8 Lev. 5 Stratum 2b

A-40-E-1	Middle Pecos Micaceous Brownware sherd	N=1
A-40-E-2	Edwards chert flake	N=1
A-40-E-3	Tecovas Scallorn arrowpoint	N=1
A-40-E-4	*Graphia shell	N=1
A-40-E-5	Tecovas flakes (29 burned)	N=78
A-40-E-6	Potter chert core	N=1
A-40-E-7	Tecovas core	N=1
A-40-E-8	Tecovas retouched flake	N=1
A-40-E-9	Artiodactyla cervical vertebrae	N=1
	Medium/Large mammal fragment	N=1
	Vertebrata fragments (3 burned)	N=13
		99

N17-18 W7-8 Lev. 6 Stratum 2c

A-40-F-1	Tecovas flakes (3 burned)	N=37
A-40-F-2	Gastropod shell	N=1
A-40-F-3	Potter chert flakes	N=3
A-40-F-4	Petrified wood flakes	N=3
A-40-F-5	Tecovas core	N=1
A-40-F-6	Tecovas retouched flake	N=1
A-40-F-7	Artiodactyla proximal phalange (distal end)	N=1
	Vertebrata fragments (1 burned)	N=2
		49

Fill from Feature 7-Burial

A-Fe7-1	Tecovas arrowpoint tip	N=1
A-Fe7-2	Alibates side scraper fragment	N=1
A-Fe7-3	Tecovas retouched flake	N=1
A-Fe7-4	Tecovas retouched flake	N=1
A-Fe7-5	Petrified wood retouched flake	N=1
A-Fe7-6	Tecovas flakes (100 burned)	N=276
A-Fe7-7	*Graphia shell	N=1
A-Fe7-8	Potter chert flakes (6 burned)	N=14
A-Fe7-9	Tecovas core	N=1
A-Fe7-10	Tecovas chunks w/cortex	N=8
A-Fe7-11	*Charcoal sample	N=1
A-Fe7-12	Vertebrata tooth (poikilothermal animal?)	N=1
A-Fe7-13	Gastropod shells	N=9
A-Fe7-14	Artiodactyla enamel tooth fragment	N=1
A-Fe7-15	Mussel shell fragments	N=7
A-Fe7-16	Cottontail rabbit right ulna	N=1
	Large mammal enamel tooth fragment	N=1
	Medium mammal distal phalange (burned)	N=1
	Small/Medium mammal dental arcade fragment	N=1
	Vertebrata fragments (15 burned)	N=72
A-Fe7-17	Artiodactyla left astragalus	N=1
A-Fe7-18	Bone awl (deer)	N=1
A-Fe7-19	Awl blank (deer)	N=1
A-Fe7-20	Awl blanks (2 that were paired) (deer)	N=2
A-Fe7-21	Mussel shell (right valve)	N=1
A-Fe7-22	Mussel shell (right valve)	N=1
A-Fe7-23	Mussel shell (left valve)	N=1
A-Fe7-24	Burned Acorns	N=5
		411

N20-21 W4-5 (Fill from Feature 8)

A-Fe8-1	Tecovas flakes (57 burned)	N=109
A-Fe8-2	Potter chert flakes	N=2
A-Fe8-3	Tecovas retouched flake	N=1
A-Fe8-4	Petrified wood flake	N=1
A-Fe8-5	Edwards chert flake	N=1
A-Fe8-6	Jornada Brownware sherd	N=1
A-Fe8-7	Medium/Large mammal fragment	N=1
	Medium/Large mammal enamel tooth fragment	N=1
	Vertebrata fragments (6 burned)	N=12
A-Fe8-8	Mussel shell fragments	N=2
		131

N17-18 W9-11 (Fill from Feature 10)

A-Fe10-1	Tecovas flakes (196 burned)	N=425
A-Fe10-2	Edwards chert flake	N=1
A-Fe10-3	Potter chert flakes	N=8
A-Fe10-4	Burned Quartz flake	N=1
A-Fe10-5	Vertebrate fragment (burned)	N=1
A-Fe10-6	Opaline flake	N=1
A-Fe10-7	Mano fragment	N=1
A-Fe10-8	Alibates flake	N=1
A-Fe10-9	Obsidian flake	N=1
A-Fe10-10	Petrified Wood flakes	N=2
A-Fe10-11	Tecovas biface fragment	N=1
A-Fe10-12	Tecovas end scraper fragment	N=1
A-Fe10-13	Tecovas arrowpoint tang	N=1
A-Fe10-14	Tecovas arrowpoint tip	N=1
A-Fe10-15	Mussel shell fragments	N=2
A-Fe10-16	Gastropod shells	N=38
A-Fe10-17	Tecovas spokshave	N=1
A-Fe10-18	Tecovas cores	N=2
		488

Feature 11

A-Fe11-1	Quartzite unifacial mano	N=1
A-Fe11-2	Quartzite bifacial mano	N=1
A-Fe11-3	Sandstone bifacial mano	N=1
		3

General Surface Collection

A-O-S-1	Jornada Brownware sherd	N=1
A-O-S-2	Jornada Brownware sherd	N=1
A-O-S-3	Roswell Brownware sherd	N=1
A-O-S-4	Tecovas retouched flake	N=1
A-O-S-5	Tecovas knife fragment	N=1
A-O-S-6	Tecovas arrowpoint preform (tip missing)	N=1
A-O-S-7	Tecovas unidentified dart point	N=1
A-O-S-8	Tecovas dart point tip	N=1
A-O-S-9	Tecovas knife fragment	N=1
A-O-S-10	Alibates unidentified dart point	N=1
A-O-S-11	Tecovas knife fragment	N=1
A-O-S-12	Tecovas knife fragment	N=1
A-O-S-13	Tecovas unidentified dart point (reworked)	N=1
A-O-S-14	Tecovas knife fragment	N=1
A-O-S-15	Tecovas unidentified dart point (reworked)	N=1
A-O-S-16	Tecovas Scallorn arrowpoint	N=1
A-O-S-17	Tecovas Scallorn arrowpoint	N=1
A-O-S-18	Tecovas Deadman arrowpoint	N=1
A-O-S-19	Tecovas arrowpoint preform (tip missing)	N=1
A-O-S-20	Tecovas Deadman arrowpoint	N=1
A-O-S-21	Tecovas Scallorn arrowpoint fragment	N=1

General Surface Collection (cont'd)

A-O-S-22	Tecovas Deadman arrowpoint fragment (burned)	N=1
A-O-S-23	Edwards chert knife fragment	N=1
A-O-S-24	Dakota quartzite retouched flake	N=1
A-O-S-25	Tecovas biface fragment	N=1
A-O-S-26	Potter chert gouge	N=1
A-O-S-27	Tecovas side scraper	N=1
A-O-S-28	Potter chert chopper	N=1
A-O-S-29	Tecovas scraper	N=1
A-O-S-30	Tecovas core remnant	N=1
A-O-S-31	Tecovas biface/chopper	N=1
A-O-S-32	Metate fragment (sandstone)	N=1
A-O-S-33A	Metate fragment (sandstone)	N=1
A-O-S-33B	Metate fragment (sandstone)	N=1
		34

GRAND TOTAL = 14,319

VITA

Jimmy Brett Cruse
2819 Shadowdale
Houston, Texas 77043

Date of Birth
February 25, 1960

Education

1974-1978 Valley High School, Turkey, Texas. Diploma.

1978-1982 West Texas State University, Canyon, Texas. Bachelor of Science (B.S.), Anthropology.

1984-1985 Texas A&M University, College Station, Texas. Master of Arts (M.A.) Candidate, Anthropology.

Employment

1986-Present Staff Archaeologist and Site Director. New World Research, Inc. and EMANCO, Inc., Houston, Texas. Duties include conducting field surveys to determine impacts on cultural resources; conducting excavations of archaeological sites; and preparing site mitigation proposals and site reports.

1985-1986 Archaeology Technician/Crew Chief. All-American Pipeline Company and Texas A&M University. Duties included the supervision of 5-7 crew members in the surveying, recording, and excavation of archaeological sites along the pipeline right-of-way in Texas, New Mexico, and Arizona; and preparing written site summaries for sites surveyed, collected, and excavated.

1984-1985 Graduate Assistant. Department of Anthropology, Texas A&M University. Duties included preparation of class exams and supervision of three work study students in the development and expansion of holdings in the Anthropology section of the library.

Publications

The Bobby Clay Site (A2070) in Motley County, Texas. In Transactions of the 17th Regional Archeological Symposium for Southeastern New Mexico and Western Texas. Panhandle Archaeological Society, Amarillo, Texas, 1981.

A Cultural Resources Survey of the Proposed Transcontinental Gas Pipe Line Corporation Trenton-Woodbury Lateral Natural Gas Pipeline Expansion, Burlington County, New Jersey. With María Elena Galdeano. New World Research, Inc. Report of Investigations No. 157 for EMANCO Inc., Houston, Texas. 1988.