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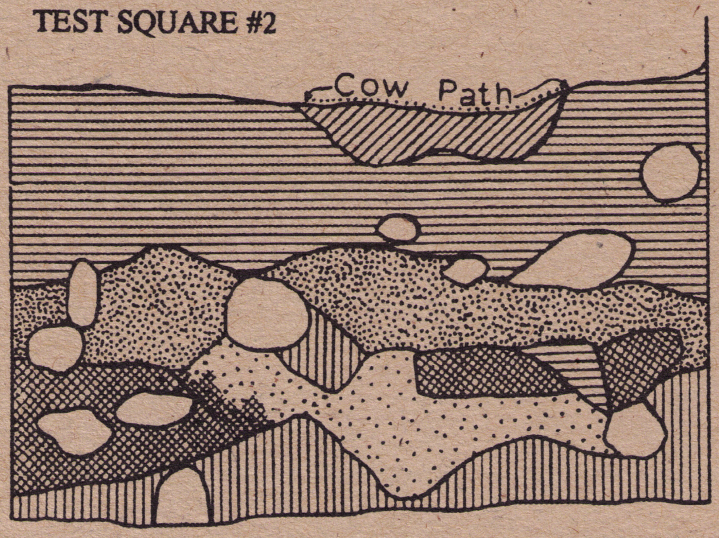
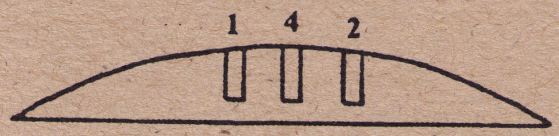
TEST SQUARE #2





Placement of Test Squares in mound (not to scale)

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Oklahoma Department of Transportation Investigations at 34CI320

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Abstract

Investigations conducted by the Oklahoma Department of Transportation resulted in the identification of a shallow, midden filled depression at site 34CI320, radiocarbon dated to about A.D. 1020. Small side-notched arrow points were recovered from the feature as well as the surface of the site. The site occupants appear to have been foragers utilizing local resources within the canyon and mesa country along the Cimarron River valley near Kenton, Oklahoma.

In the fall of 1993, 34CI320 was one of three sites in Cimarron County investigated by the Oklahoma Department of Transportation as part of a project involving bridge replacements on SH 325. The project area is located in the extreme northwestern corner of Cimarron County near the highest elevation (1,516 m amsl) in Oklahoma on Black Mesa, just north of the project. Most of Cimarron County south and east of the project area is covered by gently rolling grassland of the southern Great Plains High Plains section. However, the project is within the Raton physiographic section of the southern Great Plains. These dissected uplands, part of the Chaquaqua Plateau, are characterized by steep walled canyons and mesas cut into sandstone formations extending north and west of the project area. The break between the two landforms (about 20 km south of the project area) is abrupt and both areas support distinct plant communities.

The High Plains section is dominated by short grasses including blue grama *(Bouteloua gracilis)*, buffalo grass *(Buchloe dactyloides)*, and hairy grama *(Bouteloua hirsuta)*. Other plants such as yucca *(Yucca baccata)*, sage *(Artemisia tridentata)*, prickly pear *(Opuntia lindheimeri)*, and cholla *(Opuntia imbricata)* cactus are also present. Small trees occur in areas of sufficient moisture including cottonwood *(Populus deltoides)*, willow *(Salix nigra)*, and mesquite *(Prosopis glandulosa)*.

The canyons of the Raton physiographic section offer terrain suitable for a variety of flora. The short grasses of the High Plains dominate floodplains, along with yucca, prickly pear and cholla *(Opuntia imbricata)*. Pinyon pine *(Pinus edulis)*, Gamble oak *(Quercus gambelli)* and juniper *(Juniperus monosperma & J. scopulorum)* grow on the rocky slopes of canyon walls and mesas. In addition to cottonwood *(Populus sp.)* and willow *(Salix sp.)*, hackberry *(Celtis reticulata)*, cattails, *(Typha latif)*, grape *(Vitis vulpina)* and rushes *(Scirpus sp.)* are found near stream courses where moisture is somewhat constant.

Being situated in the vicinity of two distinct physiographic sections, a variety of fauna historically existed in the vicinity of the project area. Mammals compose much of the native faura in the region, including large animals such as bison *(Bison bison)*, pronghorn antelope *(Antilocapra americana)*, mule deer *(Odocoileus hemionus)*, white-tail deer *(Odocoileus virginianus)*, black bear *(Ursus americanus)*, and elk *(Wapiti wapiti)*. Other mammals historically common to the region include bobcat *(Lynx rufus)*, wolf *(Canis lupus)*, gray fox *(Urocyon cinereoargenteus)*, beaver *(Castor canadensis)*, raccoon *(Procyon lotor)*, porcupine *(Erethizon dorsatum)*, eastern and desert cottontail rabbit *(Sylvilagus floridanus & S. audoboni)*, and various squirrels *(Citellus sp.)*. Local avifauna include wild turkey *(Melegris gallapavo)*, golden eagle *(Aquila crysaetos)*, various hawks *(Buteo sp)*, quail *(Callipepla squamata)*, bobwhite *(Colinus virginianus)*, dove *(Zenaidura macrocura)*, and lesser prairie chicken *(Tympanuchus pallidicinctus)*.

Due to variability in stream flow and precipitation, as well as historic lowering of the

/ater table in the region, water resources such as sh and mussels are presently few. However, ecent paleontological investigations conducted 1 the Black Mesa vicinity have noted the resence of both fish and mussel shell in deposits ated from around 3,800 and 2,600 years ago Dalquest *et al.* 1990:107-106). It would appear 1at at times, small permanent pools supporting sh and mollusks occurred along some stream 1annels.

he two major streams draining this area of the [igh Plains are the Cimarron and Beaver rivers. he Cimarron heads in the Raton section of ortheastern New Mexico, entering Oklahoma ıst south of Black Mesa, passing about 800 m orth of 34CI320. This portion of the modern imarron is an intermittent stream, and the river ed is often dry (Schoff and Stovall 1943:235-36). When active, measured flows in the river's 1annel just north of Kenton average 1.3 cubic ıeters per second, ranging from 58 to .8 cubic ıeters per second (Oklahoma Water Resources oard 1991:17).

he Beaver River (referred to as the North anadian River after joining Wolf Creek in arper County) flows through the High Plains ction in the southern portion of Cimarron ounty about 35 km south of the project. The ver heads about 70 km west of the Oklahoma ate line. Like the Cimarron, the upper reaches this stream are essentially dry during much of e year (Schoff and Stovall 1943:24). Most marron County tributaries of both rivers are 1all intermittent streams which may quickly fill ıd overflow during heavy rainfall (Schoff and ovall 1943:23-24, Wilson 1972:204).

addition to streams, numerous playas occur on e High Plains section of Cimarron County. ıese intermittent lakes and ponds retain water ıring times of high precipitation. Modern ;ricultural practices including land leveling and ltivation have resulted in the destruction and ying of many of these small seasonal water urces.

ıe general climate of Cimarron County is semiarid with an average annual precipitation of about 16.8 inches (Oklahoma Water Resources Board 1991:9; Murphy *et al.* 1960:2). The majority of precipitation falls from April through September. Measured rainfall amounts reveal wide fluctuations in precipitation from year to year. Yearly precipitation extremes recorded over a 42 year period beginning in 1909 are 8.6 and 39 inches (Murphy *et al.* 1960:3)

The growing season averages 180 days with the average first and last frosts occurring on October 12 and April 22 respectively (Murphy *et al.* 1960:2). The average temperature during summer is 75 degrees F, and the average winter temperature is 35 degrees F. The temperature may exhibit wide fluctuations with highs in the summer up to 108 degrees F, and lows in winter of - 20 degrees F. The high altitude and winds tend to keep the humidity low (ibid).

PALEOENVIRONMENT

The geologic exposures afforded in the canyon lands around Black Mesa have drawn scholars from many fields in addition to archaeologists. Consequently, some information pertaining to the past environment of this portion of Cimarron County is available.

The presence of Pleistocene animal remains in the area including mammoth, horse, and bison was first noted by Schoff and Stovall (1943). A late Pleistocene Tesesquite canyon local fauna has been recently described from Pleistocene deposits dated to around 31,000 years ago (Dalquest and Stangl 1989). In addition to mammoth and horse, the deposits investigated by Dalquest and Stangl yielded several small mammal species (including cottontail rabbit, squirrel, water shrew, desert shrew, prairie dog, and pocket gopher) which are extant in, or relatively close to, Tesesquite canyon (ibid).

Other studies indicate a complicated geomorphic history of the local canyons. Wilson (1972) dated several buried tree stumps rooted in a blue clay deposit in Tesesquite canyon. The stumps were abruptly buried by stream deposits during an

episode of valley fill. The stumps, identified as willow *(Salix sp.)*, cottonwood *(Populus sp)*, hackberry *(Celtis sp.)*, juniper *(Juniperus sp.)*, and possibly pine *(Pinus sp.)*, yielded an average radiocarbon date of around 450 years B. P. on 4 samples (Wilson 1972:206-207). This evidence suggests a valley forest was present along Tesesquite Creek sometime around A.D. 1400.

Haury's (1982) study of soil profiles along South Carrizo Creek provides further evidence indicating the frequent reworking of floodplain soil deposits over the last 900 to 1000 years (Haury 1982:60). Analysis of molluscan and gastropod shell recovered from the soil profiles along the stream channel indicate that, unlike today, the stream has experienced reliable perennial flow in the past. Marshes and pools along the stream, many possibly created by beaver ponds (Dalquest *et al.* 1990), were capable of supporting considerable vegetation as well as mollusks and fish.

The above studies suggest that permanent water sources in the canyons can have a major effect on the local environment. Beaver dams and periods of high moisture can result in the establishment of localized plant and animal resources. The geomorphological evidence also reveals that in spite of the canyon floodplains being subject to episodes of cutting, filling and reworking during the Holocene, Pleistocene deposits · remain preserved in many of the canyons.

GEOLOGY

Previous work in the Cimarron Valley has noted the availability of several types of knappable stone (Schoff and Stovall 1943, Lopez and Saunders 1973, Sanders and Sanders 1982, Haury 1982). Therefore a discussion of the local geology is pertinent to provide a context from which to interpret the lithic assemblage from 34CI320.

The vertical bluffs exposed along the Cimarron river and its tributaries in the Black Mesa region offer glimpses of several geologic formations, most of which are dominated by sandstones (Figure 1). The oldest exposed formation

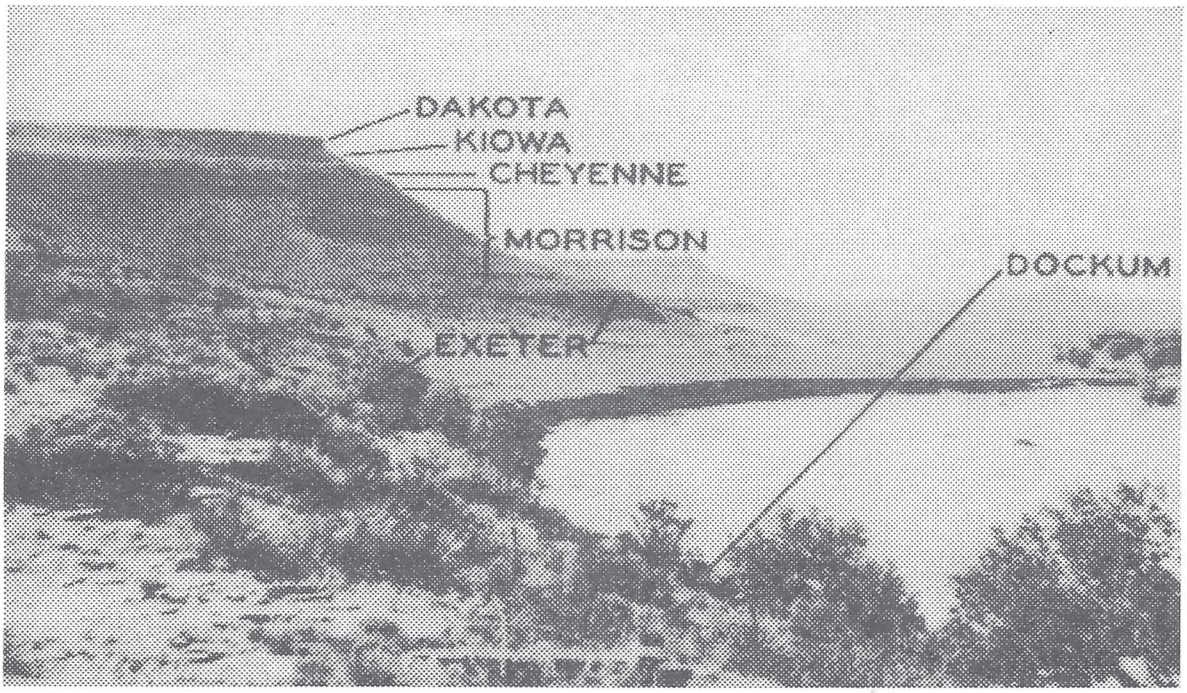


Figure 1. Geologic Formations exposed in the Cimarron Valley near Black Mesa (adapted from Schoff and Stovall 1943: Plate IV).

consists of reddish sandstones, variegated shales, and clays deposited during the late Triassic. These rocks are identified as part of the Dockum Group (Schoff and Stovall 1943:45,47). This formation is visible about 6.5 km north of 34CI320 and again about 40 km to the east. In this eastern exposure Schoff and Stovall (1943:49) report a "flinty marl" associated with this formation in the bed of House Creek. Although described as "flinty" it is doubtful this is a knappable material.

The Dockum Group is overlain by Jurassic age deposits. These include the Exeter formation, and the more dominate Morrison formation (Schoff and Stovall 1943:57-69). The earlier Exeter Formation is visible as a thin band of white to pinkish sandstone exposed along the base of valley walls and mesas.

The Morrison Formation is highly visible in the Cimarron valley, forming the bases of many of the mesas and buttes. This formation is composed of sandstones, shales, limestones, and conglomerates. Some sandstones in this formation have become silicified into quartzite sufficient for the production of chipped stone tools (Schoff and Stovall 1943:62).

Above the Morrison occur Cretaceous age shales and sandstones of the Purgatoire and Dakota formations along with shales and limestone of the Graneros and Greenhorn formations. The base of the Purgatoire contains conglomerates within the Cheyenne member. The conglomerates are reported to contain pebbles and cobbles of flint, quartz, schists, quartzite and petrified wood (Schoff and Stovall 1943: 75). A large exposure of this conglomerate is reported to occur immediately south of 34CI320 (Schoff and Stovall 1943:76). Haury (1982:47) describes two prehistoric lithic workshops (34CI126 & 127) associated with the Cheyenne member conglomerate in Gallinas Canyon, 15 km east of 34CI320. In addition to Purgatoire quartzite, she reports knappable chert cobbles averaging 10 cm or less in length and 5 cm in diameter occurring in the Cheyenne member outcrop at these sites. Artifacts from these sites include chert cobbles which have been cleaved longitudinally and flakes removed from each half. She further notes that material similar to that from this exposure was observed among the lithic debris on many sites in the area (Haury 1982:47).

The sandstones of the Dakota formation form the caps on many of the mesas and canyon walls in the region. Outcrops of this formation in Cimarron County and southeast Colorado are known to contain brownish to reddish orthoquartzites which were extensively utilized by prehistoric knappers (Banks 1990:94; Lopez and Saunders 1973).

The term Tesesquite Quartzite has been used to refer to a particular quartzite occurring in the Tesesquite Creek valley (Lopez and Saunders 1973). Several large workshops associated with outcrops of this material are documented in the site files at the Oklahoma Archaeological Survey. This grayish quartzite ranges from coarse to fine grained in texture. Lopez and Saunders (1973:3) suggest the quartzite was redeposited in the valley during the Pleistocene. The geologic origin of this material is difficult to determine and Banks (1990:94) suggests it may derive from either the Dakota or Morrison formations. The locations of Tesesquite outcrops visited by the author appear to be residual rather than redeposited and are likely associated with the Morrison Formation. These outcrops may very well be those Morrison Formation quartzite noted by Schoff and Stovall (1943:62) to have been used prehistorically as a source material for the production of stone tools.

The most significant tertiary age deposit in the area is the Ogallala Formation. The formation is composed mostly of unconsolidated sands and gravel transported from the eastern slopes of the Rocky Mountains during the Miocene and Pliocene. Large deposits of Ogallala gravel containing quartzite, chert, and various volcanic materials occur in Cimarron County. However, they are restricted for the most part to the High Plains section south and east of the project area (Rothrock 1925:59-62; Schoff and Stovall 1943:103-113). In some locations the gravel has

become cemented with caliche forming impermeable layers (Schoff and Stovall 1943:105). Schoff and Stovall (1943:105-107) also mention limestone and silicified algal formations present in the Ogallala. Sources of chalcedony known from Cimarron County may originate in these limestone structures (Saunders and Saunders 1982:105).

A knappable cryptocrystalline material referred to as "opalite" is also reported from the Ogallala Formation. Banks (1990:95) discusses a prehistorically utilized outcrop of Ogallala "opalite" reported from the Palo Duro Creek area in northeastern Texas. An outcrop of "opalite" material (34CI178) from which samples were collected and curated in the Oklahoma Archaeological Survey's lithic sample collection, is located about 4 km northeast of 34CI320. However, the location from which the samples were collected appears to correlate with outcrops of the Cheyenne Conglomerate. Haury (1982:47) suggests a "white opaline petrified wood" found in small blocky chunks at 34CI178 originates in the Cheyenne conglomerate outcrop at the site. Based on her brief description and the comparative samples at the OAS, it would appear that the "opalite" material occurring on sites in the Cimarron Valley may very well originate from the Cheyenne conglomerate.

In addition to the Ogallala, other Tertiary age deposits occur in the region as well. Most notable is the thick black basalt forming the caprock of Black Mesa. Although difficult to knap, artifacts made of this material are reported on sites in the Black Mesa region (Saunders 1978:89).

Gravel occurring in Quaternary deposits along the Cimarron River likely contains secondary deposits of material derived from all of the above sources (Schoff and Stovall 1943:127-128). Such deposits could also have served as a material source for prehistoric knappers.

Other obtainable but more distance sources of lithic material in this region of the High Plains include Alibates agatized dolomite available from its source, about 250 km south of Black Mesa. A lateral equivalent to the Tecovas formation known as the Baldy Hill Formation outcrops in northeast New Mexico. Jasper-like material from this formation is available in the Cimarron Valley about 35 km east of 34CI320. Obsidian artifacts have been recovered from several sites in Cimarron county (Saunders and Saunders 1982). The likely source of this material is located in the Jemez Mountains of north-central New Mexico (Baugh and Terrell 1982:10).

In summation, several sources of knappable lithic material are locally available in the vicinity of 34CI320. Prehistorically exploited outcrops of Dakota and Tesesquite quartzite are nearby and easily accessible. Pebbles and small cobbles of chert are present in the conglomerates of the Purgatorie as well as Ogallala formations in the area. In addition, chalcedony and "opalite" sources have been documented in the vicinity.

ARCHAEOLOGICAL BACKGROUND

Human occupations in the High Plains region encompassing Cimarron County are known to extend as far back as Paleoindian times. The following section provides a general background of cultural manifestations in the region as well as a brief discussion of previous work conducted in the vicinity of 34CI320.

Paleoindian (11,500-8,000 B.P.)

Clovis (11,500-11,000 B.P.)

Clovis occupation near the project area is evidenced by finds at several sites including Blackwater Draw in eastern New Mexico. Here, Clovis points and tools have been found in association with mammoth remains (Hester et al 1972:). The distribution of Clovis points in Oklahoma hints that Clovis bands may have frequented the Black Mesa vicinity. As of 1990, 18 Clovis points have been documented from Cimarron County, the highest number from any county in Oklahoma (Hofman and Wyckoff 1991:30).

Folsom (11,000-10,300 B.P.)

Folsom occupations in the vicinity of Cimarron

County are evidenced from finds at a site near Folsom New Mexico, the type site for Folsom points. This site yielded finds of distinctive fluted projectile points in association with an extinct form of bison. Other Folsom sites evidencing bison hunting have since become known in this region of the Southern plains. These include the Lipscomb site in the eastern Texas Panhandle where the remains of up to 55 *Bison antiquus* were discovered in association with several Folsom points (Hofman *et al.* 1989). Recent discoveries in Harper County, Oklahoma include two Folsom kill sites. The Waugh and Cooper sites provide evidence of repeated use of this area by Folsom hunters some 10,500 years ago. Both sites contain remains of *Bison antiquus* in association with Folsom points. The Cooper site consists of three distinct bone beds representing different kill episodes. The bottom bed yielded a *Bison antiquus* skull with a painted design (Bement 1993). Three Folsom points documented by Hofman (1993:73) are evidence of Folsom occupations in Cimarron County.

Late Paleoindian (10,000-8000 B.P.)
The Nall site in Cimarron County has produced several projectile points attributable to late Paleoindian occupations (Baker at al. 1957). Here, along with 2 Clovis and 1 Folsom point, several lanceolate points resembling Plainview, Meserve, and Angostura types have been identified. A similar assemblage is reported from the Muncy site in Texas County where in addition to 2 Clovis points and a Midland point, several lanceolate points attributable to late Paleoindian occupations are described (White 1987:50). Another late Paleoindian site, the Olsen-Chubbuck site is located north of Cimarron County in eastern Colorado. This site is a large bison kill with associated Firstview and San Jon-like points (Wheat 1972).

Archaic (8000-2000 B.P.)
Archaic period occupation on the southern High Plains entails a large expanse of time. The period is commonly subdivided into early, middle, and late periods. The environment became increasingly drier during the early Archaic, culminating with the Altithermal during the middle Archaic some 4,500 to 6,000 years ago (Holliday 1989). Likely experiencing some fluctuation, the environment is thought to have become fairly stable beginning about 4,000 years ago. Although extending over a vast time period, Archaic occupations in the region are not well documented.

Early Archaic (8000-7000 B.P.)
Evidence of early Archaic occupations in the region is scanty. Stuart and Gauthier (1981:300) state that "the early Archaic period in northeast New Mexico is virtually unknown". Campbell (1976:49) mentions seven sites on the Chaquaqua Plateau containing projectile points characteristic of early Archaic horizons. However, he is not clear on what he defines as the early Archaic since projectile points he attributes to the early Archaic span much of the Archaic period.

Middle Archaic (7000-4000 B.P.)
Few materials attributable to middle Archaic cultures are reported from this portion of the High Plains. Basally-notched bifaces relating to the Calf Creek horizon are reported from the Texas Panhandle (Parker and Mitchell 1979) and as isolated finds in the Oklahoma Panhandle and adjacent southeastern Colorado (Rhoton 1994; White 1995).

The Mckean Complex has been defined on the northern and central High plains from around 3000 to 4000 B.P. Four point types have been attributed to this complex including Duncan, Hanna, Mckean and Mallory (Frison 1978:50; Grieser 1985:90-91). A Hanna point is reported from 34RM600B, a site situated on the Dempsy Divide in western Oklahoma (Thurmond 1990:148) and Mallory type points have been recovered from the Muncy site in Texas County, Oklahoma (White 1986:55, 61). These finds may evidence McKean occupations extending onto the southern High Plains.

Late Archaic (4000-2000 B.P.)
Late Archaic occupations appear to be better represented in the region. The Nall site (Baker *et al.* 1957) in Cimarron County, as well as the Johnson-Cline site in Texas County (Lintz

1978:131) have yielded corner-notched dart point styles attributed to Late Archaic occupations. Several corner-notched dart point forms, as well Clear Fork Gouges are documented from the Muncy site in Texas County (White 1987:52-59). Although some dart point fragments were found by Saunders (1978) in his Black Mesa State Park survey, no sites could be attributed to Archaic occupations (Saunders 1978:80). A few late Archaic sites are known in northeastern New Mexico (Stuart and Gauthier 1981:300-302).

Woodland (2000-1000 B.P.)

Detailed site descriptions and assemblages attributable to Woodland period occupation on the southern High Plains are few. However, several radiocarbon dates from southeast Colorado evidence Woodland occupations in the region (Nowak and Fedor 1992:92). It is during this time that the use of pottery and the bow and arrow along with corner-notched arrow points become widespread. Also, circular structures constructed using vertically laid stone slab foundations appear on the Chaquaqua Plateau during this time. Archaeological evidence suggests that hunting and gathering was increasingly supplemented by horticulture. Corner-notched dart and arrow points, cordmarked pottery, and grinding implements are typical of artifact assemblages from this period.

Graneros Focus

Although the material culture of the Woodland period is somewhat better known than that of the Archaic, there is some difference of opinion among scholars on defining cultural sequences during this time period. Withers (1954) defined the Graneros Focus as appearing on the Chaquaqua plateau from A.D. 450 through A.D. 1000. This is further divided into early and late foci. The main differences between the foci are an increase in the construction of stone slab structures, use of arrow points over dart points, and an increase in cordmarked pottery. These material culture changes are accompanied by an escalating reliance on small mammals during the late Graneros focus.

Las Animas Tradition

Gunnerson (1989) includes the Woodland and subsequent Plains Village manifestation, known as the Apishapa phase, under the Las Animas Tradition (A.D. 500-1400). He proposes that the material culture differences between Woodland and Plains Village times are not well enough defined to differentiate among many of the Woodland period and Plains Village sites (Gunnerson 1989:12).

Woodland occupations in the Cimarron County area may be manifest at 34CI199 on Carrizozo Creek about 1.5 km west of the project area. Corner-notched arrow points and dart points were recovered from this site. Two features were radiocarbon dated to around A.D. 900-1000 (Saunders 1983). The artifact assemblage from the Muncy site in Texas County contains several corner-notched arrow points and dart points evidencing Woodland occupations on that site (White 1987:60,74). White (1987:82-83) notes a marked increase in the number of Woodland artifacts over those attributed to Archaic occupations. Also in Texas County, the presence of Woodland peoples at the Johnson-Cline site is evidenced by corner-notched arrow and dart points (Lintz 1978:131).

Plains Village (1000-500 B.P.)

The Plains Village tradition in the vicinity of Cimarron County is represented by the Antelope Creek and the Apishapa phases. A continuation of stone slab foundation construction is evident during this period. Multi-room structures along with an increase in the number of dwellings per site are characteristic of this time period. Rectangular structures appear in the Oklahoma and Texas panhandles. These changes in habitation are accompanied by an increase in horticulture, particularly the growing of maize. Materials recovered from caves in the area suggest that squash may have been grown as well. Aside from village sites and temporary camps, rockshelter occupations are known from this period.

Side-notched arrow points become predominant over corner-notched arrow points, with dart points becoming rare. Pottery is cordmarked and vessels are often large. Contact with Pueblo cultures is evidenced by the presence of Southwest pottery sherds, obsidian, and turquoise.

Based on spatial, as well as some material and architectural differences, two phases have been defined in the region. The Apishapa phase has been defined for the Chaquaqua Plateau in southeastern Colorado and the Antelope Creek phase is identified for the High Plains region in the Oklahoma and Texas panhandles.

Apishapa Phase (950-650 B.P.)
Campbell (1976) defines Late Prehistoric Plains Village occupations on the Chaquaqua Plateau of southeast Colorado as the Apishapa phase. He proposes this tradition rose from local Woodland occupations. Subsistence is thought to have focused on hunting and gathering supplemented by some horticulture. A general lack of storage pits and farming implements such as bison bone tools indicates horticulture was a minor part of the subsistence base. Noting a similarity in material culture, Campbell includes the Apishapa and Antelope Creek phases under the Panhandle aspect and suggests that Antelope Creek likely represents late Apishapa. Apishapa sites are characterized by circular, stone foundation structures, cordmarked pottery, and side-notched arrow points, as well as a continued, although diminished use of dart points (Campbell 1976:58).

Antelope Creek Phase (700-650 B.P.)
In contrast to Campbell, Lintz (1986:3) has proposed the Apishapa and Antelope Creek phases be subsumed under the Upper Canark variant of the Southern Plains Village tradition. His in-depth study of architecture, community patterning, and mortuary practices suggests that the phases represent two distinct cultural groups. He postulates that the Antelope Creek phase originated from local Woodland groups.

Antelope Creek sites typically contain rectangular stone foundation structures, sometimes constructed in contiguous room blocks. Structures often have a channel through the center of the floor area (Lintz 1986:97-98). Cordmarked pottery, side-notched arrow points, alternately beveled knives, and highly formalized endscrapers are characteristic of the Antelope Creek material assemblage. In contrast to the Apishapa phase, the presence of bison bone farming implements as well as storage pits on village sites, indicate an increased reliance on horticulture.

Several Plains Village sites have been identified in the region. Sites with remains of slab-lined structures have been excavated in Texas and Beaver counties. The Roy Smith (34BV14) site in Beaver County contained the remains of a multiroom structure dated to around A.D. 1250 (Schneider 1969:177). Lintz (1986:29-31) includes this site among those relating to the Antelope Creek phase. The site's stone artifact assemblage includes corner-notched, side-notched, and triangular arrow points, along with endscrapers, drills, and beveled knives. Bone tools include awls, bison tibia digging stick tips, and bison scapula hoes. Several cordmarked pottery sherds also were recovered (Schneider 1969:140-165). The Stamper and Two Sisters sites in Texas County produced similar architectural and artifact assemblages and are also attributed to the Antelope Creek phase (Lintz 1979, 1986).

Closer to 34CI320, Saunders (1978:83) identified Plains Village occupations at six sites in Black Mesa State Park. Although the sites are not attributed to a particular cultural complex, Saunders (1978:81) notes an apparent increase in Plains Village sites and components in the area over the previous Woodland occupations.

Protohistoric (500-250 B.P.)
During the protohistoric, there is an influx of Athabaskan speakers over the high plains. The Dismal River complex, defined in the area north of 34CI320, is thought to be representative of people whose descendants are Apache. Occupations attributed to this complex extend as far as southeastern Colorado (Gunnerson

1960:144). The Tierra Blanca complex, defined in the northern Texas Panhandle region, is also thought to be related to Plains Apache groups (Habicht-Mauche 1992, Hughes 1989). Haury (1982:27-28) describes a protohistoric site (34CI280) on South Carrizo Creek with possible ties to Apache groups. Small triangular side-notched and unnotched arrow points, endscrapers, micaceous pottery, and European trade goods are common on Dismal River sites. With the addition of southwestern pottery and turquoise, similar items are also found on Tierra Blanca complex sites .

The Edwards and Wheeler complexes have been identified in western Oklahoma during the Protohistoric. Edwards is the earlier of the two and thought to last from A. D. 1500 to 1650 (Hofman 1984). At present the differences between the two complexes are not entirely clear, other than some temporal and minor material differences, mainly in lithic material. No sites attributable to either complex have been discovered in the region around Cimarron County.

Historic

Much of the historic use of this area centers around the Cimarron cutoff of the Santa Fe trail which led traders and travelers across what is now Cimarron County between 1840 and 1870's. Parts of the trail are still visible across the Northwestern portion of the county. Fort Nichols was established in 1865 by Kit Carson in what is now Cimarron County to protect travelers on this section of the Santa Fe trail. The life of this outpost was brief ending with its abandonment less than a year later. The site is now on the National Register of Historic Places (NRHP). Inscription Rock, has been recently placed on the NRHP and is located along the Cimarron River in Cimarron County.

Historic indigenous people such as the Kiowa, Comanche, and Cheyenne used the region mainly as a hunting ground. This use continued until buffalo were eliminated from the region in the late 19th century. Subsequent to this event large cattle and sheep ranches were established in the region.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS IN THE BLACK MESA AREA

The earliest archaeological investigations in the area focused on the numerous caves and rock shelters in the region. Interest in the caves was spurred by the 1928 discovery of projectile points in association with extinct Pleistocene bison near Folsom, New Mexico. In 1929, Dr. E.B. Renaud of the Colorado Museum of Natural History, excavated three caves in the Kenton vicinity, as well as four in northeastern New Mexico (Renaud 1930). Dry conditions in the caves allowed for the preservation of many perishable items. Basketry, cordage, yucca sandals, animal skin bags, and wooden items were recovered. Food remains found included corn, acorn cakes, and squash, along with bones of bison, deer, antelope, elk, and rabbit (Renaud, 1930:123-125). Stone tools recovered from the caves consist primarily of utilized flakes derived mostly from local quartzite (Renaud 1930:126-127). The assemblage includes projectile points, drills, and end scrapers, although not in large numbers. Pictographs and petroglyphs are also associated with the caves. The majority of the items recovered from the caves likely relate to Woodland and Plains Village occupations. This assumption is based on the recovery of arrow points and cultigens (Lintz and Zabewa 1984:172). In 1976, three of the caves were included on the NRHP. A detailed discussion of the caves and the material recovered from them is provided by Lintz and Zabawa (1984).

Little in the way of archaeological work was conducted in the vicinity during the 1940's. Although not described until 1957, many of the artifacts described from the Nall site were recovered during the 1930's (Baker et al. 1957). This Cimarron County site is situated in the plains and most material was surface collected as the site eroded. The large collection of Paleoindian points from this site has since become an important reference documenting early occupation of the region.

'he Black Mesa area witnessed an increase in rchaeological work in the 1970's. Some ›rehistorically exploited sources of lithic material n Cimarron Valley were described by Lopez and ›aunders (1973). A more in-depth study nvolving the distribution of lithic material on ›rehistoric sites in Cimarron County was :onducted by Saunders and Saunders in 1982. This study recognized a significant use of local naterials within the Cimarron Valley and a higher percentage of nonlocal materials, mainly Alibates, on upland plains sites.

Lintz (1976) excavated 34CI81 located along the Cimarron River within 1 km of 34CI320. Although no diagnostic artifacts were found, the recovery of stone tools in association with bison bone suggests this is a bison kill/processing site. Also in the 1970's, Saunders (1978) conducted an archaeological survey of Black Mesa State Park in which he identified 25 sites. Recorded site settings include bluff sites, rockshelters, and terrace sites. Most of the sites are attributed to Plains Village occupations (Saunders 1978:83).

In 1981, salvage excavations were conducted by ODOT at 34CI199 about 1.5 km west of 34CI320 revealing several hearth features containing remains of bison, bird, and mussel shell (Saunders 1983). An oval rock-lined hearth produced two radiocarbon dates of 1090 +\- 60 B.P. (TX-4416) and 1080 +\- 50 B.P. (TX-4417, Saunders 1983: 27-29). A corner-notched arrow point, grinding stone fragment, and bison remains were found in association with this hearth. A small circular hearth produced a radiocarbon date of 900 +\- 70 B. P. (TX-4415) (Saunders 1983:29-33). A corner-notched arrow point base, two arrow point blade fragments and stone pipe fragments were recovered from excavations within and adjacent to this feature. Also, in the early 1980's Haury (1982) conducted archaeological and geomorphological studies in the vicinity. In addition to documenting episodes of stream cutting and filling along South Carrizo Creek, 25 archaeological sites were identified. Site localities proved varied including buried sites, as well as surface sites on terrace, bluff, and upland settings.

SITE INVESTIGATION

The investigations of 34CI320 consisted of the excavation of three 1x1m test pits (Test Pits A, B & C) and a series of east/west shovel tests placed at 10m intervals. All were excavated in 10 cm levels. In addition, an intensive surface collection was made from the site area. Upon identification of a probable feature in Test Pit A, a second 1x1m pit (Test Pit D) was excavated adjacent to Test Pit A. Excavation was conducted only to the point where the presence of a cultural feature could be confirmed. Both test pits are located on what is apparently the southern edge of the feature. Therefore, interpretation of the feature is based on a limited amount of information since the feature was not completely uncovered and no plan view was obtained.

The feature (Feature 1) appears to be a shallow midden filled depression or pit. The presence of some fire cracked rock in the fill may be an indication the feature served as a hearth or oven. The fill is noticeably darker than the surrounding soil and contains small flecks of charcoal, burned and unburned bone fragments and artifacts. The artifacts include arrow points, utilized flakes, lithic debitage, and a groundstone item.

A radiocarbon date was obtained from charcoal recovered from Levels 2 and 3 of Feature 1. The charcoal sample was comprised of small flecks collected in the field and recovered from flotation of soil samples. The total sample submitted was less than 2 g and was subjected to an extended count. A radiocarbon age of 1020 +\- 90 B.P. (Beta-75041) was obtained from the sample with a calculated intercept of the radiocarbon age and

the calibration curve at A.D. 1020 (Stuiver and Pearson 1993).

Recovered Cultural Material

A majority of the 763 artifacts recovered from 34CI320 are lithic items. Other materials include pottery sherds and ground stone items. A total of 559 items were collected from the surface, the remainder from excavations (Table 1). In addition to artifacts, a small amount of mussel shell and animal bone was retrieved during excavation.

Lithic Artifacts

This section includes descriptions of the 758 lithic artifacts from 34CI320. Items subsumed under this category are projectile points, bifaces, unifaces, cores and lithic debitage. Description and analysis of stone tools will center on identification of lithic raw materials and tool types.

Bifacial Artifacts

A total of 48 artifacts exhibit flaking on more than one face and are described in this section. Included are projectile points, preforms, a drill and miscellaneous bifaces. The miscellaneous bifaces are described as early or late stage according to the degree of reduction exhibited by the artifact.

Projectile Points A total of 9 projectile points, complete and fragmentary were recovered during the investigation of 34CI320 (Table 2). All but one are small arrow points. The one exception is a heavily damaged basally-notched fragment found in an old road bed crossing the northern portion of the site. Three of the arrow points were retrieved from the surface, and five from the excavations, three of which were recovered from Feature 1. Measurements and material types are presented in Table 2.

Basally-notched Point (Figure 2) This biface fragment exhibits burin-type breaks on both lateral blade edges. Most of the stem is missing as well. The biface originally exhibited prominent laterally extending barbs formed by basal notches, only one of which remains. The artifact is severely damaged, rendering the utility of comparison with defined types questionable.

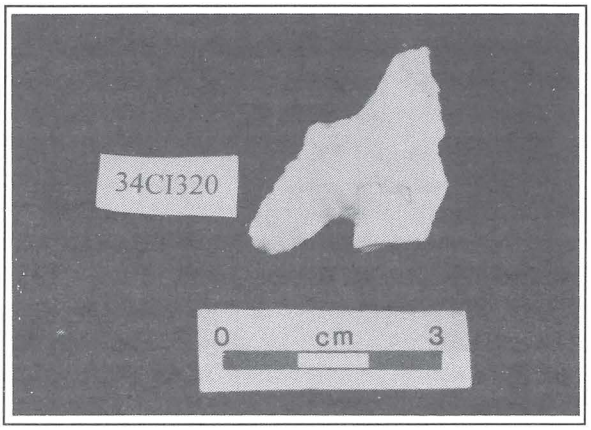


Figure 2. Basally-notched point recovered from 34CI320.

Side-notched Arrow Points (Figure 3a-e) Five small side-notched arrow points were recovered from 34CI320. The small notches are shallow and located near the base. Neck width at the notches on this series of points varies from 6.0 to 9.4 mm. As evident in Table 2, the base shapes are concave, straight, and convex. Blade length is variable, however stem length is fairly consistent. One point (Figure 3e) exhibits distinct serration along the blade edges. Side-notched points comparable with Reed or Washita points are reported from the region (Campbell 1976:40; Saunders 1978). However, the points from 34CI320 do not fit well into either description and exhibit closer similarities to each other than either Reed or Washita types. Side-notched points similar to those from 34CI320 are illustrated or described in several published reports on sites in the region (Gunnerson 1989; Saunders 1978:51; Wiseman 1975:92-93).

Table 1. Provenience of Artifacts Recovered from 34CI320

ovenience	Flakes Primary	Secondary	Tertiary	Biface	Blocky Debris\ Shatter	Cores	Projectile Points	Bifaces*	Unifaces	Pottery	Ground-stone
urface	22	28	288	11	130	35	4	33	4	2	2
ature 1											
est Pit A											
Level 1	---	3	35	3	1	1	---	2	---	---	1
Level 2	3	2	44	1	7	1	2	2	---	---	---
Level 3	1	1	7	1	---	---	1	---	---	---	---
Test Pit D											
Level 1	---	2	14	1	1	---	---	2	---	---	---
Level 2	---	---	1	---	---	---	---	---	---	---	---
Level 3	---	---	2	---	---	---	---	---	---	---	---
est Pit B											
Level 1	---	1	14	1	1	---	1	---	---	---	---
est Pit C											
Level 1	---	1	18	---	2	---	1	---	---	---	---
Level 2	1	---	8	---	2	---	---	---	---	---	---
hovel Tests											
0W Level 1	---	1	---	---	---	---	---	---	---	1	---
0W Level 1	---	---	4	---	2	---	---	---	---	---	---
Level 2	---	---	1	---	---	---	---	---	---	---	---
Level 3	---	---	1	---	---	---	---	---	---	---	---
20E Level 1	---	---	1	---	---	---	---	---	---	---	---
Level 2	---	---	---	1	---	---	---	---	---	---	---
Total	27	39	438	19	146	37	9	39	4	3	3

*includes preforms, drill and miscellaneous bifaces

Table 2. Attributes of Projectile Points from 34CI320

Figure Number	Provenience	Lithic Material	Total Length	Maximum Width	Thickness	Neck Width	Base Shape
2	Surface	Opalite	31.5*	27.6*	4.5		
3a	Surface	Alibates	15.6*	11.8(bl)	2.6	9.4	straight
3b	Test Pit C Level 1	Tesesquite Quartzite	14.9	9.4(bs)	2.5	6.0	convex
3c	Test Pit A Level 3	Tesesquite Quartzite	13.1*	10.0*	2.7		concave
3d	Surface	Opalite	17.2	10.5(bs)	2.6	8.4	convex
3e	Test Pit A Level 2	Basalt	25.4	8.7(bl)	3.0	3.0	straight
3f	Test Pit B Level 1	Tesesquite Quartzite	14.5*	10.0*	2.7		
3g	Surface	Tesesquite Quartzite	10.0*	11.2*	2.6		
3h	Test Pit A Level 2	Chert	12.5*	10.0*	2.5		

all measurements in mm
*indicates original total length or maximum width not measurable due to breakage
(bs) = maximum width occurs at base, (bl)= maximum width occurs on blade

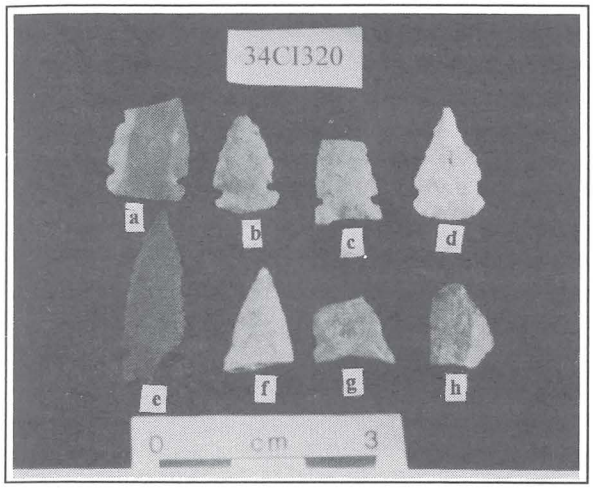


Figure 3. Side-notched arrow points (a-e) and arrow point fragments (f-h) recovered from 34CI320.

Arrow Point Fragments (Figure 3f-h) Three artifacts are identifiable as blade fragments of small arrow points. The lack of stem elements hinders the comparison of these artifacts to those described above. However, the blade fragments do compare favorably too, and could very well be fragments of similar points.

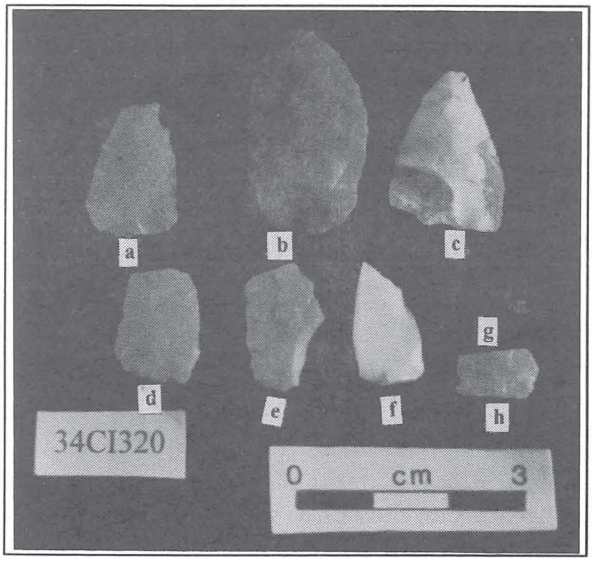


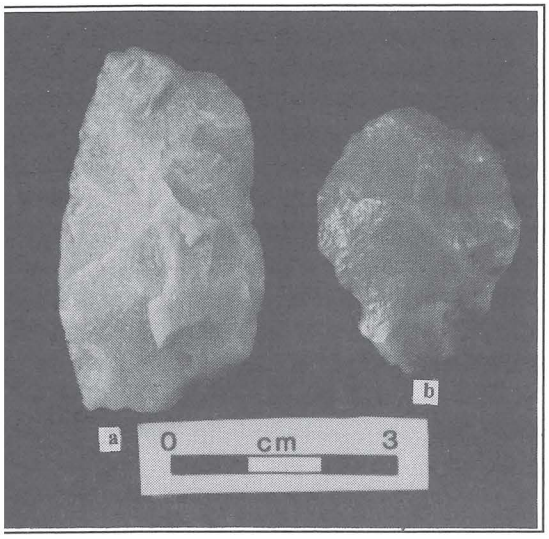
Figure 4. Arrow point preforms from 34CI320.

Preforms (Figure 4) Eight bifaces are of the appropriate size and exhibit attributes suggesting they were intended as arrow point preforms subsequently discarded due to breakage or stacks resulting from flaking failures. All were recovered from the surface. Five (63%) of the preforms are of Tesequite Quartzite (Figure 4a,b,d,e,h), 2 (25%) are Opalite (Figure 4c,f), and one (13%) is of basalt (Figure 4g). The length of the three complete preforms range from 28 to 19.9 mm, the width is 16.7 to 12.5 mm, and thickness is 6.5 to 4.2 mm.

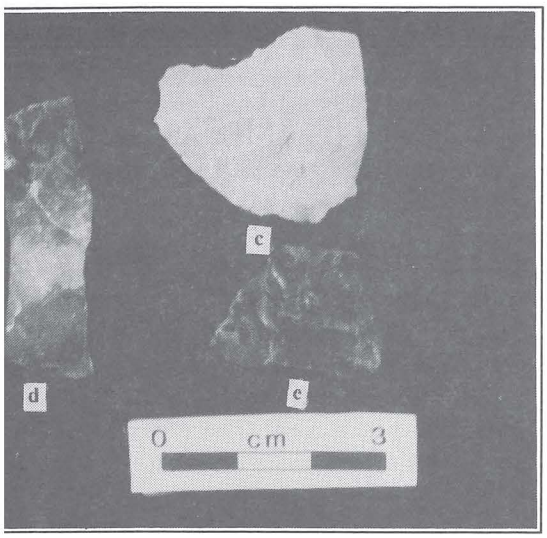
Drill Fragment One biface fragment recovered from the surface is identifiable as a drill tip manufactured of chalcedony. Due to the fragmentary nature of the artifact, metric attributes were not recorded.

Miscellaneous Bifaces A total of 30 items recovered from 34CI320 are classed as miscellaneous bifaces. They are described as early or late stage bifaces according to the degree of flaking, thickness and edge attributes of each artifact. Only six of these items were recovered by excavations (Table 1). All but 3 of the 30 artifacts are fragments. All are variable in shape and extent of flaking.

The complete artifacts are early stage bifaces manufactured of Tesesquite Quartzite. One of these items is a large biface manufactured from a large flake retaining cortex on its dorsal face. The artifact exhibits only minimal flaking and may have served as a core. The other two complete bifaces are much smaller, and do not appear to be part of a formal reduction trajectory (Figure 5a,b). An additional 10 biface fragments are identifiable as portions of early stage bifaces. Seven are of Tesesquite Quartzite, two are of Opalite, and one is of chert. Seventeen biface fragments derive from late stage bifaces, some of which exhibit edges that appear to have been heavily used, with some apparently used after breaking. Only three of the late stage fragments exhibit a more formalized shape such as convergent lateral edges and biconvex cross sections (Figure 5c-e). The remaining 14 items, although bifacially flaked, do not appear to have



ure 5 a, b. Complete early stage bifaces from :I320.



ure 5 c-e. Late stage bifaces from 34CI320.

n part of any formalized shaping trajectory. ead they exhibit random shapes, irregular es and variable cross sections. Raw material d to manufacture these items include 8 of esquite Quartzite, 3 of Opalite, 5 of chert, 1 of ovas Jasper, and 1 of a chalcedony-like erial very similar to material described from rces in the vicinity of Abiquiu Pueblo near the ez Mountains (Banks 1990:67-70; 125-126).

Unifacial Artifacts (Figure 6a-d)

Four artifacts recovered from the surface of 34CI320 are classed as unifaces. The morphology of all four items, two of which are complete, is consistent with hafted endscrapers. All are manufactured on flakes, three having been modified on their distal end, and one along a highly convex lateral edge. All are made on different material including Dakota Quartzite (Figure 6b), Tesesquite Quartzite (Figure 6c), Opalite (Figure 6a), and petrified wood (Figure 6d).

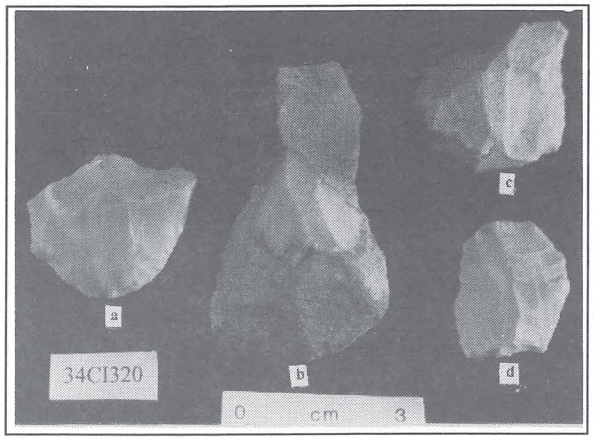


Figure 6. Unifacial tools from 34CI320: a-d, endscrapers.

Lithic Debitage

Items in this category include 523 flakes and 146 pieces of blocky debris and shatter. Cores are also included and described in this category.

Lithic debitage is classed by flake categories of primary, secondary, tertiary, and biface. *Primary* includes all flakes with cortex over 90% or more of their dorsal surface. *Secondary* have less than 90% cortex on the dorsal surface as well as scars from previous flake removals. These two flake types are typically produced during initial stages of reduction. The flake categories *tertiary* and *biface* include flakes having no cortex on their dorsal face and are produced during later reduction stages. *Tertiary* flakes are produced from cores and typically have a low number of

dorsal flake scars and high angled platforms. The primary criteria for differentiating between *tertiary* and *biface* flakes are the lipped platforms and bidirectional and convergent dorsal flake scars exhibited by flakes removed from bifaces. Although many of the flakes are broken, all are classed in one of the above categories based on as many flake attributes as possible. Raw material types are also identified (Table 3).

Flakes Of the 523 flakes recovered from 34CI320, 349 (67%) were retrieved from the surface (Table 1). A total of 121 (23%) were excavated in association with Feature 1 and the remaining 53 (10%) are from shovel tests and Test Pit's B and C. The majority of the flakes are small, averaging less than 20 mm in length.

Table 3 provides the material types by flake category of the recovered flakes. A total of 207 (39.5%) are Tesesquite Quartzite, 195 (37%) are chert, and 73 (14%) are Opalite. The remaining 9.5% of the flakes are from a variety of materials including Dakota Quartzite, Tecovas Jasper, basalt, siltstone, Alibates agatized dolomite, quartz, and obsidian. A majority of the flakes, 438 (84%) are tertiary while a total of 66 (12.5%) of the flakes are primary and secondary. The cortex present on all but the quartz flake is rough, a characteristic of bedrock sources. The primary and secondary chert and some opalite flakes exhibit a rough cement-like cortex. The cortex present on flakes of Tesesquite Quartzite, while not rough is typical of that observed on blocks present at residual outcrops in the Tesesquite Creek valley. Only 19 (3.5%) of the flakes are classed as biface flakes. A surprising number (94, 18%) of the total flakes exhibit macroscopically visible evidence of utilization. Most (72%) of these are chert and opalite.

Blocky Debris/Shatter A total of 146 pieces of blocky debris and shatter were recovered from 34CI320. These items are byproducts of lithic production which do not exhibit typical flake attributes. Most (59%) of this material is chert and opalite, whereas 34% is Tesesquite Quartzite. The remaining 7% is miscellaneous material.

Cores A total of 37 cores are present in the site sample. All but two were recovered from the surface. Most (31, 84%) are chert and opalite (Table 3). Four are Tesesquite Quartzite, one is Dakota Quartzite, and one is petrified wood. The chert and opalite cores are small and cortex remnants present on some specimens are rough and cement-like. This type of cortex is consistent

Table 3. Lithic materials represented in debitage from 34CI320.

Lithic Material	Flakes					Blocky Debris\ Shatter	Cores	Sum Total
	Primary	Secondary	Tertiary	Biface	Total			
Opalite	----	5	64	5	74	36	17	127
Chert	4	16	170	4	194	48	14	256
Tesesquite Quartzite	16	15	168	8	207	26	4	260
Dakota Quartzite	----	----	17	2	19	----	1	39
Tecovas Jasper	2	1	5	----	8	2	----	10
Basalt	----	1	5	----	6	----	----	6
Siltstone	4	1	2	----	7	----	----	7
Alibates Dolomite	----	----	4	----	4	----	----	4
Obsidian	----	----	1	----	1	----	----	1
Other*	1	----	2	----	3	11	1	15

*includes quartz, petrified wood, and unidentified material

with in-situ sources rather than stream gravel deposits. Most are multi-platform, expended cores with some exhibiting a flake removal pattern resulting in a roughly wedge shaped core (Figure 7). The cores were apparently manufactured by splitting small cobbles and using the newly exposed surface as the primary platform. The longer flake scars retained on these cores roughly correspond to the average size of the chert flakes recovered from the site. The cores range from 42.6 to 24 mm in length, 37.1 to 13.5 mm in width, and 41.5 to 12 mm in thickness. The weight of the 32 chert and opalite cores range from 68.4 to 6.9 g, with an average of 15 g. The five quartzite cores are much larger and range in length from 60.4 to 33.8 mm, 43.2 to 24.5 mm in width, and 45.2-17.5 mm in thickness. Weight of these items ranges from 180.8 to 14.9 g, averaging 58.7 g.

Groundstone Artifacts

These stone items are shaped by pecking and grinding. Two manos and one small groundstone tool were recovered.

Manos (Figure 8a, b) One mano and one mano fragment were recovered from the surface of 34CI320. The complete mano of unidentified quartzite is bifacial with convex faces. One face is much more convex and both faces exhibit heavy use. The artifact is 133.5 mm in length, 76.3 mm wide, and 43.2 mm in maximum thickness.

The mano fragment is of Tesesquite Quartzite. The working face of this mano is relatively level with the opposite face convex and apparently only minimally used. The width of this artifact

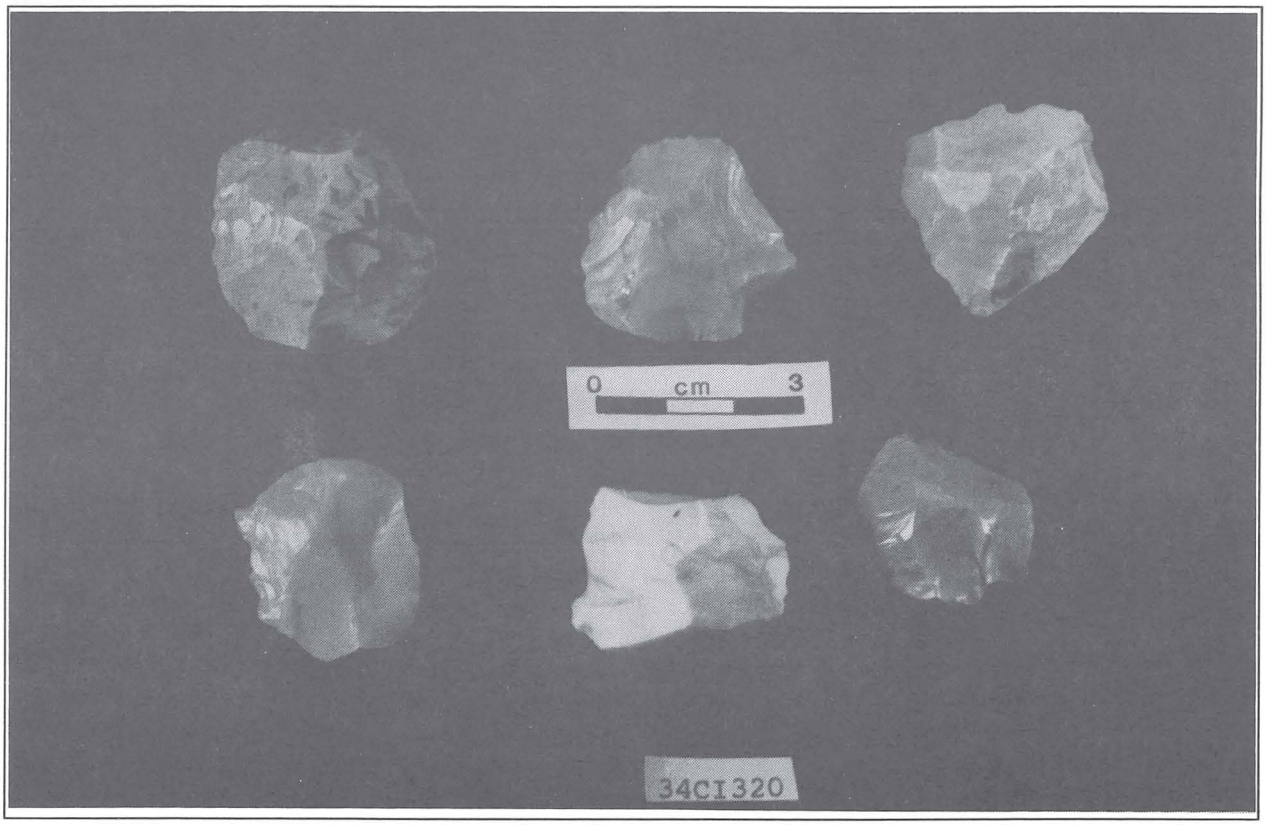


Figure 7. Selected cores from 34CI320.

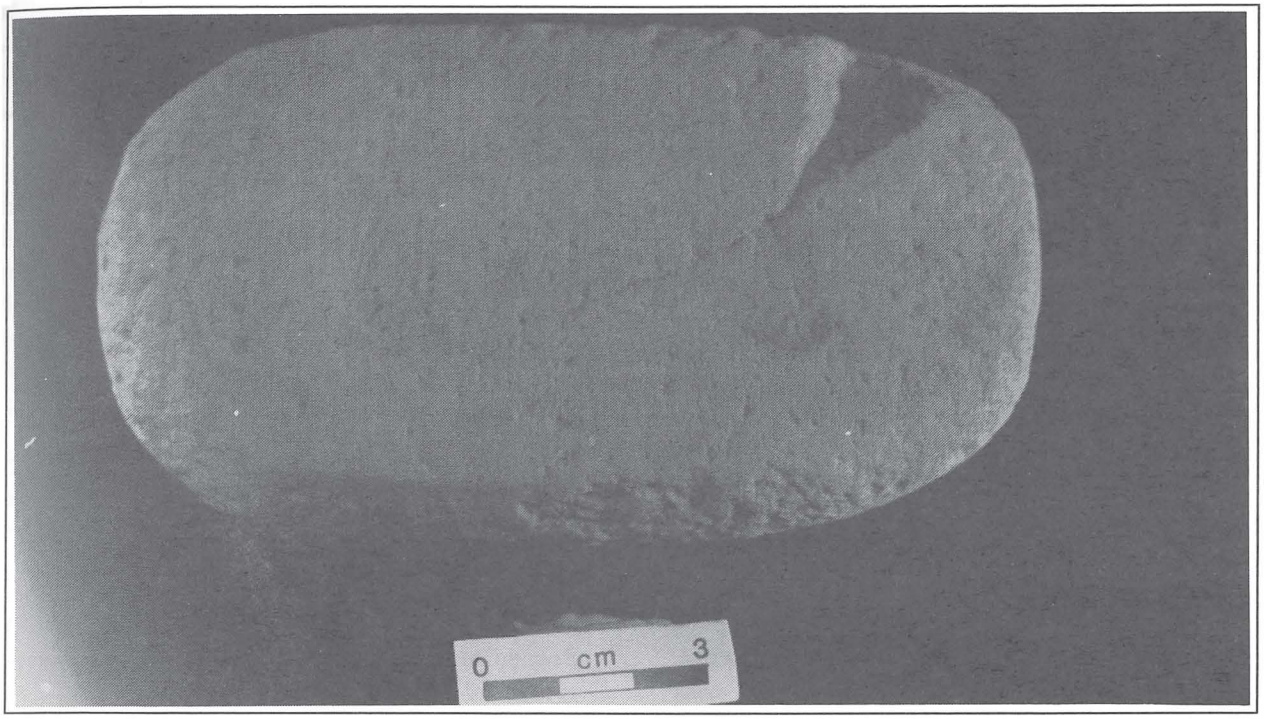


Figure 8a. Complete mano from 34CI320.

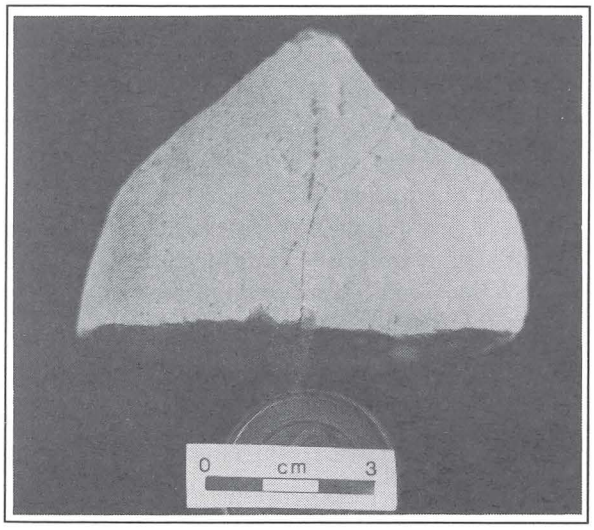


Figure 8b. Mano fragment from 34CI320.

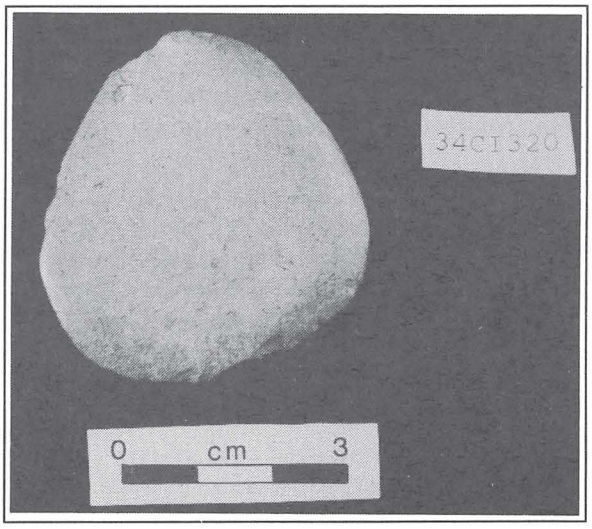


Figure 8c. Miscellaneous groundstone tool exhibiting polish from 34CI320.

is 83.5 mm, and the thickness is 57.2 mm.

Miscellaneous Groundstone (Figure 8c) A subtriangular polished stone artifact measuring 47.0 x 44.9 mm, and 9.0 mm thick was recovered from Test Pit A, Level 1. The tool is of an unidentified gray volcanic stone, possibly basalt. The artifact is biconvex in cross-section and well smoothed on both faces. The edges are rounded and polished with a high polish visible from the edges of the tool, four to eight mm onto each face. This polish is evidently the result of heavy use, possibly in an activity such as smoothing hides.

Hammerstones

A total of four complete hammerstones were recovered from the surface. Three are of Tesesquite Quartzite. One is basically round and exhibits heavy battering on all faces. Another is ovate and relatively flat on two faces. All edges of this artifact bear the marks of heavy battering. The remaining Tesesquite hammerstone is a small oval stone with flat faces. Scars resulting from use are evident around the entire edge of this artifact. The fourth hammerstone is a well rounded cobble of unidentified quartzite likely obtained from a gravel deposit. It bears evidence of minimal use on two ends.

Three small fragments of hammerstones were also recovered. All are of Tesesquite Quartzite.

Pottery

Three small pottery sherds were recovered during the 34CI320 investigations (Table 1). All are too small to affiliate with any formally defined type or vessel shape and exhibit no markings or decoration. The largest sherd was recovered from the surface and measures 16.5 x 15.2 mm, and is 6.0 mm thick. The sherd is tempered with sand and crushed stone. The exterior is dark gray, the interior surface brown, and the core is black. The other surface provenience sherd is 12.8 x 5.4 mm and 5.4 mm thick. Due to the small size of this sand tempered sherd, the exterior and interior surfaces cannot be distinguished. The surfaces are brown and brownish gray, and the core is black. The sherd recovered from Shovel Test 20W, Level 1, measures 8.6 x 8.4 mm and is 4.3 mm thick. It has a sand and crushed stone temper and is also too small to distinguish interior and exterior surfaces. One surface is brown, the other a brownish gray while the core is black.

Saunders (1983:62) describes a sand tempered sherd with similar colors from 34CI199. This plain sherd was the only one recovered from the site. Wiseman (1975:95) also describes similar sand and crushed rock tempered ceramics from the Sitio Creston site near Las Vegas, New Mexico.

Faunal Material

Although in low quantity, animal remains were recovered from Feature 1 and Test Pit B. Most are small, unidentifiable fragments.

Bone

Burned and unburned fragments of bone were recovered from Feature 1. All are too fragmentary to identify beyond being from small mammals and possibly bird. A total of 5 burned fragments are from Test Pit D Level 1, 5 unburned fragments are from Test Pit A Level 2, and 2 unburned fragments are from Test Pit A, Level 3. One unburned bone fragment was recovered from Test Pit B, Level 1.

Mussel Shell

Fragments of mussel shell were recovered from both test pits in Feature A, as well as from Test Pit B. Larger fragments were collected in order to attempt an identification of species. However, upon lab analysis, none proved large enough to adequately identify species.

Floral Material

Ten liter soil samples collected from levels 2 and 3 of Test Pit A were subjected to flotation to recover any charred organic remains from Feature 1. After flotation the light fraction was sorted through 2 mm, 1 mm, .5 mm and .25 mm geologic screens. Each sample except those from the .25 mm and smaller screens was fully sorted under 10x to 25x magnification. Contamination by rootlets and other modern organic material was estimated at 90% by volume for each sample.

Charcoal recovered from the flotation samples was utilized in radiocarbon dating.

A total of 17 charred purslane (*Portulaca*) and 7 cheno-ams (*Chenopodium & Amaranthus*) seeds were identified from the level 2 sample. In addition one small round unidentifiable seed was recovered. The level 3 sample produced 9 charred purslane, 11 cheno-ams, 1 bulrush (*Scirpus sp*), and 5 unidentifiable seeds.

The heavy fraction was sorted through 2 mm, 1 mm and .5 mm screens and only briefly scanned. Other than charcoal, unidentifiable bits of burned and unburned bone were observed as well as several small chert, opalite and quartzite flakes. These items were not included in the previously discussed counts. However, at least ten of the roughly 20 small flakes observed were likely detached from bifaces.

CULTURAL-HISTORICAL IDENTIFICATION AND SITE FUNCTION

The artifact assemblage from 34CI320 appears to represent a single component. Side-notched arrow points recovered from both surface and excavated contexts, including Feature 1, are one diagnostic trait of this component. With the exception of one bifacial drill fragment and 4 unifacial endscrapers, no other formal chipped stone tool types were recovered by the investigation. However, it appears that a technology involving the splitting of small cryptocrystalline cobbles to produce small cores was employed by the site's inhabitants. The flakes struck from the cores were often utilized as tools as well as providing blanks for the production of arrow points. This notion is supported by the high number of small cores (84% of total cores) made of these materials in the site sample as well as the fact that 72% of the 94 flakes exhibiting macroscopic use wear are of chert and opalite.

Although a few bifacial arrow point preforms, and other bifacial fragments are represented on the site, the lithic debitage reflects very little in the way of biface production at the site. The 30 biface fragments from the site indicate the use of biface technology, however, their variable shapes and the lack of consistent attributes on most of the items suggests they are not the result of a formalized trajectory to produce specific tools. When considering the scarcity of biface flakes on the site and the nature of the recovered bifacial items, it appears that the production of formalized bifacial tools played only a minor role in the lithic technology during the occupation of 34CI320. The one exception is the arrow point assemblage. Arrow point preforms may well have been manufactured on the site with the small flakes removed during manufacture being too small to allow recovery in 1/4" screens. The presence of several small biface flakes in the flotation samples from Feature 1 may be evidence of this activity.

Although the occurrence of obsidian and Alibates on 34CI320 evidences the use of non-local lithic material on the site, the analysis indicates that about 98% of the lithic material was obtained from local sources. The chert and opalite used on the site were likely obtained locally from the Cheyenne conglomerate. Based on available descriptions of the material within this geologic formation (Schoff and Stovall 1943:75-76, Haury 1982:47), it would appear that it is the only formation in the vicinity from which small chert and "opalite" cobbles could be readily obtained. Since the recovered material exhibits a rough cortex, stream gravel sources seem unlikely. Although the nearby outcrop of the Cheyenne formation described by Schoff and Stovall (1943:76, 255) was not visited by the author, the chert and opalite present on 34CI320 may very well have been obtained from this source located within 1.5 km of the site.

Several sources of Tesesquite Quartzite are known along Tesesquite creek 5.5 km east of 34CI320. However, comparisons of this material to other quartzite outcrops in the area have not been performed, and an accurate assessment as to the exact source of quartzite material found on sites in the area is not possible at present. The quartzite recovered from 34CI320 does compare well with the Tesesquite Creek sources, and was

likely obtained from these locations (if not from other undocumented sources located even closer).

The function of the small groundstone artifact recovered from the Feature 1 is uncertain. The high polish exhibited along its edges may be the result of hide working. The recovery of one complete and one fragmentary mano suggests some plant processing occurred during the prehistoric occupation of 34CI320. The small number of charred purslane and cheno-am seeds recovered by flotation from Feature 1 may be reflective of the use of these plants by 34CI320's prehistoric inhabitants.

The three pottery sherds, though small, are consistent in color and temper. Although too small to compare with a formal type, they appear to be of a similar ware. The recovery of sherds indicates the presence of ceramic vessels, but the low number of sherds would seem to suggest pottery was not extensively used on the site. A dearth of pottery sherds appears to be common at sites in this portion of the Cimarron valley (Lintz and Zabawa 1984:170).

The one radiocarbon date of around A.D. 1020 obtained from Feature 1 is not inconsistent with the artifact assemblage. Although based on very few dates, Campbell (1976:58) reports side-notched arrow points become more common than corner-notched arrow points on the Chaquaqua Plateau beginning around A.D. 1000. Gunnerson (1989:9) considers side-notched arrow points to be a diagnostic trait of Apishapa occupations on the Chaquaqua Plateau, particularly during the what he refers to as "Classic Apishapa" during the 1300's. His "Classic Apishapa" was defined for the most part after work at the Cramer site, about 130 km northwest of 34CI320. Here, a series of radiocarbon dates was obtained on both bone and charcoal collected from the remains of a habitation structure (Gunnerson 1989:53). Gunnerson rejects the four charcoal dates, which have corrected time spans from about A.D. 1050 to 1210 as too early. He argues that they are likely burned heartwood possibly centuries older than the actual occupation of the site (Gunnerson 1989:56). Instead, he accepts two bone dates whose corrected ages suggest occupation of the site around A.D. 1300 to 1410 (Gunnerson 1989:53). However, bone often produces dates which err on the young side (Stafford *et al* 1987). To further complicate the dates, Gunnerson's bone dates were obtained on combined samples of bone pieces collected from particular areas (Gunnerson 1989:55).

On the other hand, the calibrated charcoal dates (Stuiver and Pearson 1993) from the Cramer site suggest occupation between A.D. 1100 and 1200. The dates correspond well to Lintz's (1986:27) suggestion of a 1100-1350 time span for Apishapa. If the charcoal dates from Cramer are accepted and the bone dates from that site rejected, then the evidence from that site would indicate a predominance of side-notched arrow points in the region by around A.D. 1100. If the radiocarbon charcoal date from 34CI320 is accepted (and granted it is the only date from the site) then the predominate use of side-notched arrow points may be evident by some groups in the region as early as A.D. 1020. Although some arrow points types such as Washita, Harrel, and Reed have been identified by previous investigators in the region, the points in the 34CI320 assemblage do not fit well into any of these types. Some attributes may overlap the range of variability among these types, but they are more similar to themselves than to typical points of the other types.

Further comparisons of the artifact assemblage from 34CI320 may be made with the Carrizozo Creek site just west of 34CI320. The corrected dates (Stuiver and Pearson 1993) from the Carrizozo Creek site (34CI199) suggest occupation sometime around A.D. 980 for Feature 1, and around A.D. 1170 for Feature 2. A corner-notched point, grinding stone fragment, and bison bone are associated with Feature 1, a large oval hearth (Saunders 1983:27-29). No diagnostic artifacts were recovered from Feature 2, a small circular hearth. Units excavated adjacent to the feature produced a side-notched arrow point (Saunders 1983:29-33). The site has

been interpreted as representing a Plains Woodland manifestation. Indeed many of the diagnostic artifacts recovered and investigated features on the site suggest a Woodland foraging subsistence pattern was practiced by the sites occupants and the date from Feature 2 suggests this lifeway may have persisted in the area into the 1100's. Foraging appears to have remained an important part of subsistence among Apishapa groups who also were practicing horticulture on the Chaquaqua Plateau (Campbell 1976:10, 58-63).

Overall, this investigation demonstrates that 34CI320 was likely occupied sometime circa A.D. 1000-1100. Site activities likely included the hunting of small animals, gathering and processing of wild plants and probably hide processing. Remaining unclear is who the people were and how they may relate to other sites in the area.

The occupants of 34CI320 may have been part of the Apishapa foraging/horticultural phase recognized on the Chaquaqua Plateau to the north and west. The charcoal radiocarbon dates from the Cramer site overlap with the one from 34CI320 and the projectile points from both sites exhibit similarities. Other stone slab structures in southeast Colorado attributed to Apishapa have been radiocarbon dated as early as A.D. 990 (Nowak and Fedor 1992:92). The Apishapa people may have ventured into the Cimarron valley on a seasonal basis to forage. This scenario may in part explain the lack of structures and scarcity of ceramics on Late Prehistoric sites in the valley. Alternatively the site may be the remains of a camp left by people practicing a general foraging subsistence pattern. Evidence from the nearby Carrizozo Creek site suggests that a Woodland type of foraging pattern was practiced by groups in the region just prior to, and possibly just after, occupation at 34CI320.

The archaeological evidence from 34CI320 as well as that from some of the studies mentioned in this report, suggest that some major changes were occurring in this High Plains region around A.D. 1000. Some increase in horticulture and more permanent structures and villages was occurring on the Chaquaqua plateau north of the Cimarron valley. Evidence within the valley itself, from sites such as Carrizozo Creek site and 34CI320 indicate the possibility that different subsistence patterns and likewise different cultural groups may have been using the Cimarron valley at this time.

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