Chapter 7

LATE PREHISTORIC STAGE

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GENERAL BACKGROUND

Chronology and Database of the Context Area

The Late Prehistoric stage spans the period from A.D. 100 to 1725 and is divided into three periods: Developmental (A.D. 100 to 1050), Diversification (A.D. 1050 to 1450), and Protohistoric (A.D. 1450 to 1725). Two distinct phases, Apishapa (A.D. 1050 to 1450) and Sopris (A.D. 1050 to 1200), are defined within the Diversification period. This stage therefore largely corresponds to the Ceramic stage and the initial portion of the Protohistoric/Historic stage taxa presented in the previous eastern Colorado plains research context (Eighmy 1984). The current taxonomy replaces the term "Ceramic" with "Late Prehistoric" because the former places undue emphasis on a single technological component of a dynamic and complex segment of prehistory; in fact, ceramics do not occur in the archaeological record of the earliest portion of the Late Prehistoric stage. The Las Animas tradition was also developed previously to categorize selected post-Archaic sites in southeastern Colorado, specifically small sites lacking diagnostic materials sufficient for their assignment to either the "Graneros" or "Apishapa" focus (see Chapter 4). However, this spatially restricted taxon tends to ignore marked similarities and interrelationships among sites in both the South Platte and Arkansas River basins as well as in northeastern New Mexico. According to Gunnerson (1989:13), "Traits diagnostic of the Las Animas tradition would be rock enclosures, cord roughened pottery, and small projectile points. The predominance of non-cord roughened pottery or the predominance of large projectile points would disqualify a component from inclusion in the Las Animas tradition. At present, I would see this more inclusive tradition as being restricted to southeastern Colorado and I would not necessarily assume close cultural relationships among all the components." By this definition, sites such as Lindsay Ranch and Magic Mountain would be excluded on the basis of location despite the presence of Las Animas tradition diagnostic traits (Nelson 1971; Kalasz and Shields 1997). The generic Late Prehistoric stage is applicable to all of eastern Colorado and thus circumvents any spatial preconceptions. Therefore, this taxon describes more appropriately the bridge between a widespread, long-standing hunter-gatherer tradition and the appearance of historically known cultures.

At its commencement, the Late Prehistoric stage was characterized by new technologies superimposed on a well-established Archaic stage mode of existence. As the Late Prehistoric stage progressed, the Arkansas River Basin witnessed important changes in settlement, subsistence, technology, trade, and demographics. As is apparent from Figure 4-1 (see also Appendix A), the great majority of chronometrically dated sites in the basin are associated with this segment of prehistory. Indeed, the sheer volume of Late Prehistoric stage data relative to those available for earlier stages necessitates a deviation from the format followed in the Paleoindian and Archaic chapters. In contrast to previous sections, sufficient data exist to synthesize research at each hierarchical level in the proposed taxonomy. Such synthesis is intended to provide the reader with summaries that become increasingly detailed as one progresses from general Late Prehistoric stage developments to finer grained cultural units such as the Developmental, Diversification, and Protohistoric periods. Phase distinctions (Sopris and Apishapa) currently discernible only within the Diversification period are the ultimate level of description in the following text. This manner of presentation is intended to provide researchers

with greater flexibility to access particular kinds of data. Some may require specific information pertaining to the Sopris phase, and others may desire a only a general overview of the Late Prehistoric stage. A degree of redundancy is therefore purposefully built into the text to address more easily a range of research needs. Identical research themes (chronology, population dynamics, technology, site type and locational variability, economy, and architecture) are provided for each taxon, but additional subheadings are placed where the data are adequate to address more specific topics. A discussion of community mortuary practices, for example, is currently appropriate only for the Sopris phase. Overall, this section is hierarchically organized so that the general Late Prehistoric stage synthetic narrative is followed by more detailed, chronologically ordered Developmental, Diversification, and Protohistoric period data. The Diversification period is similarly organized so that the thematic discussion of overall trends is followed by separate detailed descriptions of the two constituent phases, Sopris and Apishapa. Given the profusion of data associated with post-Archaic adaptation in the context area, and the confusion that has sometimes accompanied its interpretation, a major goal of this section is to synthesize and summarize available information at each taxonomic level.

The onset of this stage has long been tied to dates associated with the initial appearance of bow-and-arrow and ceramic technologies. However, the absolute timing of these events has not been well established in the context area. Further, construction of dwellings with stone wall foundations and the introduction of maize horticulture are traditionally associated with the beginning of the Late Prehistoric stage, but more recent excavations indicate that the initial appearance of these attributes may need to be pushed back into the Archaic stage (Rood 1990; Rood and Church 1989; Zier 1989). Although absolute dates are infrequently associated with diagnostic artifacts and features, the few that are available can be used to establish a baseline chronology for the Late Prehistoric stage. On the other hand, undue emphasis on these dates may limit our ability to perceive variability in the adoption and integration of new technologies. Most importantly, the exchanges and/or innovations tied to these events are probably not going to occur at uniform rates across the context area. Indeed, the available data indicate that these technological changes did not appear in the region as a coherent complex. Perhaps for this reason the age given for the beginning of the Late Prehistoric stage varies from A.D. 1 to A.D. 200 to A.D. 450, depending on the investigator (Alexander et al. 1982; Campbell 1969a; Eighmy 1984; Hunt 1975; Lintz and Anderson 1989; Zier 1989). Given the limited data sets, all may be more or less correct, especially given the potential effects of the old wood/heartwood problem on radiocarbon-dated contexts. This timing problem on the eastern plains and foothills of Colorado is often circumvented by proposing a long, chronological buffer or transition between the Archaic and Late Prehistoric stages or within the latter stage itself.

It is first important to review a number of absolute dates discussed in the previous research context for the Arkansas River Basin (Eighmy 1984). The earliest absolute age associated with ceramics and arrow-size projectile points in the context area was recovered from Metate Cave (Eighmy 1984:104; Campbell 1969a:187-193). This single radiocarbon age, 1680 ± 95 B.P. (uncalibrated), or A.D. 270, was obtained from charcoal recovered in proximity to cord-marked pottery sherds and a variety of projectile points including small, triangular, corner-notched Scallorn arrow points (Campbell 1969a:193). Additionally, the Metate Cave interior was circumscribed by a low-standing semicircular wall that, if one assumes the charcoal sample and structure are contemporaneous, represents one of the oldest radiocarbon-dated examples of Late Prehistoric stage stone wall construction in the context area (Campbell 1969a:187). The earliest absolute date for open or free-standing Late Prehistoric stage architecture in the Arkansas River Basin was recovered from the Belwood site (Hunt 1975). This radiocarbon age, 1500 ± 55 B.P. (uncalibrated), or A.D. 450, was obtained from charcoal located at the base of a bell-shaped pit in House 1 (Hunt 1975:6). Earlier Late Prehistoric stage architectural dates are known from northeastern New Mexico occupations adjacent to the context area (Biella and Dorshow 1997a).

The radiocarbon-dated context at the Belwood site was also associated with cord-marked ceramics and the mixture of arrow and dart points long recognized as typical of the early portion of the Late Prehistoric stage. Belwood therefore represents the earliest radiocarbon-dated ceramic association in the context area after Metate Cave.

Relatively few excavations in the 15 years since publication of the previous research context have provided additional insight into the timing of Late Prehistoric stage technological advances. Early dates for pottery and arrow points are suggested by the recovery of radiocarbon data from two sites, 5EP576 and 5EP935, in the Crow's Roost region along Black Squirrel Creek east of Colorado Springs (McDonald 1992; Wynn et al. 1993). At site 5EP576, a two-sigma, calibrated radiocarbon estimate of 976-538 B.C. (raw age of 2640 ± 80 B.P.) was obtained from bone recovered in a stratum designated Level A. A number of small, triangular corner-notched points, similar to the Scallorn type and presumably associated with bow-and-arrow technology, were also collected from this thick, undifferentiated Level A colluvium. A younger but still rather early radiocarbon date is associated with Scallorn points as well as cord-marked pottery at site 5EP935. Charcoal yielding a two-sigma, calibrated radiocarbon age estimate of 88 B.C.-A.D. 315 (raw age of 1890 ± 60 B.P.) was recovered along with these artifacts from another thick, undifferentiated section of colluvium designated Component A. These radiocarbon data from 5EP576 and 5EP935 must be interpreted with caution due to the lack of fine-grained stratigraphic associations between the artifacts and dates. Further, provenience information more specific than that of general component or stratum is not reported for the artifacts.

Pottery and Scallorn points were recovered from stratigraphic Unit Two at Davis Rockshelter, a site located near Black Squirrel Creek on the Monument-Palmer Divide north of Colorado Springs (Dwelis et al. 1996). An early date for the Late Prehistoric stage occupation within Unit Two is indicated by a charcoal sample yielding an uncalibrated radiocarbon age of 1810 ± 60 B.P. (Dwelis et al. 1996:5). However, younger uncalibrated radiocarbon ages of 1420 ± 50 B.P. and 1070 ± 60 B.P. were also obtained from charcoal associated with Unit Two. Artifact associations with the earliest date should not be assumed, because the authors report that the depositional context of the site is complex and that artifacts were disturbed by erosional events and burrowing animals (Dwelis et al. 1996:4). Perhaps for these reasons the provenience of the radiocarbon samples and their spatial relationship to the diagnostic artifacts are not discussed in the article.

Excavations at Recon John Shelter and site 5HF1109 resulted in some reasonably firm associations between radiocarbon ages and artifacts related to the introduction of the bow-and-arrow and ceramics. Site 5HF1109 is situated along a tributary of the Huerfano River southwest of the Wet Mountains near Gardner (Zier et al. 1996b). A small, triangular corner-notched projectile point resembling the Scallorn type was collected in direct association with a small hearth designated Feature 3 (Zier et al. 1996b:67). Charcoal recovered from Feature 3 produced a two-sigma calibrated radiocarbon age range of A.D. 65-395 (raw age of 1820 ± 70 B.P.). Recon John Shelter is situated along Turkey Creek on Fort Carson (Zier 1989; see also discussions of Archaic components in Chapter 6, this volume). A small, crude corner-notched projectile point that was not classified as Scallorn but is nevertheless unquestionably of arrow point size was recovered within 1 m horizontally and 10 cm vertically of a charcoal sample that yielded an uncalibrated radiocarbon age of 1910 ± 90 B.P. (cal 1868 B.P.) (Zier 1989:Tables 5, 17; Figures 32, 48, 51). Further, a cord-marked sherd was collected within 2 m horizontally, and at the same vertical provenience, of another Recon John charcoal sample. The uncalibrated age of 1500 ± 70 B.P. obtained from this sample matches the age of the previously discussed sample associated with cord-marked ceramics at the Belwood site (Zier 1989:Tables 5, 26; Figures 48, 52). However, the Recon John date was calibrated to 1389 B.P. (A.D. 561 [Zier 1989:Table 5]) using the system of

Stuiver and Reimer (1986). Ceramics were recovered from deeper Archaic-stage contexts at Recon John Shelter but they were unquestionably associated with rodent burrows (Zier 1989:192).

The information presented above indicates that the radiocarbon ages associated with points and/or ceramics at Metate Cave, the Belwood site, Recon John Shelter, and 5HF1109 provide the best opportunities for dating the introduction of new technologies that signal the beginning of the Late Prehistoric stage in the Arkansas River Basin. The development of calibration techniques has significantly improved the reporting of radiocarbon age estimates in recent years. There is thus the potential for considerable discrepancy in radiocarbon age interpretations between earlier and more recent archaeological projects. The Metate Cave and Belwood site ages were uncalibrated; those from Recon John Shelter and 5HF1109 are calibrated, but with the use of different programs. To facilitate comparison among these age estimates, all were calibrated through a common program, CALIB version 3.0.3 (Stuiver and Reimer 1993) and the data presented in Table 7-1. The table indicates that the general age range traditionally given for the onset of the Late Prehistoric stage remains valid, but the data also suggest that the advent of bow-and-arrow technology preceded the introduction of ceramics.

Table 7-1. Radiocarbon Dates from Selected Sites that Signal the Beginning of the Late Prehistoric Stage.

Site Name/ No.	Artifact Association	Raw Radiocarbon Age (B.P.)	Calibrated Age		Two-Sigma Calibrated Age Ranges from Probability Distributions (Method A)	
			A.D. /B.C.	B.P.	A.D./B.C.	B.P.
Recon John	Projectile point	1910 ± 90	A.D. 88, 98, 115	1862, 1852, 1835	91 B.C.-A.D. 336	2041-1614
5HF1109	Projectile point	1820 ± 70	A.D. 230	1720	A.D. 65-399	1885-1551
Metate Cave	Projectile point/ceramics	1680 ± 95	A.D. 397	1553	A.D. 134-601	1816-1349
Belwood	Ceramics	1500 ± 55	A.D. 596	1354	A.D. 430-658	1520-1292
Recon John	Ceramics	1500 ± 70	A.D. 596	1354	A.D. 418-666	1532-1284

However, the Archaic-Late Prehistoric shift involves more than the introduction of new technologies; other factors such as increasing sedentism and perhaps an expanded population may have also played a role. It is therefore advantageous to develop other means by which the transition may be discerned. The distribution of absolute ages in general, not just those associated with diagnostic artifacts, provides some valuable insight into the timing of the Archaic-Late Prehistoric stage progression. The compilation of absolute dates for the Arkansas basin listed in Appendix A is presented graphically as a histogram in Figure 4-1. A dramatic rise is apparent after 2000 B.P., or within the approximate temporal range traditionally associated with the onset of the Late Prehistoric stage. The number of radiocarbon dates remains high until approximately 500 B.P., within the general temporal range associated with the onset of the Protohistoric period. These data may signify more intensive Developmental period and Diversification period activity and a concomitant increase in population, or simply that these sites are more likely to be

investigated by archaeologists because of their visibility. Factors such as the increased use of stone architecture tend to render Developmental and Diversification sites more conspicuous. It is also a given that Late Prehistoric stage sites are more likely to be preserved in the open, shallow depositional environments typical of southeastern Colorado. Archaic deposits such as those at Recon John and Gooseberry shelters tend to be deeper and therefore more difficult (and expensive) to excavate extensively (Kalasz et al. 1993; Zier 1989). Since younger, shallow occupations such as those at the Cramer and Avery Ranch sites tend to receive the more thorough excavations, greater numbers of features are studied and more radiocarbon data are obtained (Gunnerson 1989; Ireland 1968; Watts 1971; Zier et al. 1988). This matter may be resolved only through additional discoveries of older deposits and subsequent, large-scale excavations.

High-altitude occupation during the Late Prehistoric stage is poorly known. Only limited excavation has been undertaken at Late Prehistoric sites, and so little chronometric data are available that it is difficult to distinguish between components of the Developmental and Diversification periods. The Protohistoric period is almost completely undocumented in the mountainous portions of the context area. For these reasons, high altitude cultural manifestations are included in the stage-level discussions rather than under subsections devoted to the specific periods within the Late Prehistoric stage. The limited database is derived from the Runberg site on Cottonwood Pass in Chaffee County (Black 1986); the Campion Hotel site and site 5LK6 (rather ponderously named the Twin Lakes Dam Overflow site) on Lower Twin Lake in Lake County (Buckles 1979); Water Dog Divide site and site 5CF499 on Monarch Pass (Hutchinson 1990); and the Trout Creek Pass quarry near Buena Vista (Chambellan et al. 1984). Much attention is given the Runberg site (Black 1986) in Chapters 5 and 6. This shallow multicomponent site produced late Paleoindian and abundant Archaic evidence of Mountain tradition occupation. A Late Prehistoric component (designated VI) is present at Runberg as well, manifested as a hearth and "relatively abundant" lithic and ground stone artifacts (Black 1986:116-123). This component is believed to be of Developmental period age based on the presence of a small corner-notched projectile point; this assessment is not supported by chronometric data. A Late Archaic component at the Campion Hotel site is noted in Chapter 6. Buckles (1979:24-87) observes that both Late Archaic and Late Prehistoric projectile points are present, and that the majority are small arrow points. He also observes that the single radiocarbon date of A.D. 160 seems too early for most of the cultural materials (Buckles 1979:24). The site produced abundant lithic artifacts, several ground stone artifacts, a plain ware ceramic sherd, and bone tools and unmodified faunal remains. Nearby site 5LK6 exhibits similarities to the Campion Hotel site (Buckles 1979:97-107). This site also appears to span the Late Archaic-Late Prehistoric boundary, displaying projectile points that overlap stylistically those at the Campion Hotel site. Game drives with associated features, particularly blinds, occur on Monarch Pass; as noted in Chapter 6, there is evidence of Archaic use of these systems as well. The Water Dog Divide site yielded Developmental period and Diversification period dates of A.D. 890 ± 60 and A.D. 1230 ± 60, respectively, while 5CF499 produced a Protohistoric date of A.D. 1600 ± 60 (Hutchinson 1990). The Trout Creek Pass quarry, as noted in Chapters 5 and 6, has produced abundant surface evidence as well as limited radiometric data indicating at least sporadic use beginning in Paleoindian times and extending over the course of the Archaic stage. Surface artifacts consisting of both projectile points and Puebloan ceramics, as well as radiocarbon dates from hearths of A.D. 910 ± 50 and A.D. 1040 ± 50, indicate that the site was utilized during all three periods of the Late Prehistoric stage (Chambellan et al. 1984:69, 72).

Population Dynamics

This section considers further the subject of population growth and/or movements within the Arkansas River Basin during the Late Prehistoric stage. Most importantly, questions pertaining to whether new populations entered or long-standing populations departed the Arkansas

River Basin are addressed. Investigations both in the past and more recently, whether survey or excavation, lead to a common conclusion: prior to the Protohistoric period, the Late Prehistoric stage is characterized by an indigenous hunter-gatherer population that developed out of the preceding Archaic stage with minimal external influences (Andrefsky 1990; Biella and Dorshow 1997a; Campbell 1969a; Eighmy 1984; Gunnerson 1989; Hand and Jepson 1996; Kalasz et al. 1993; Lintz 1984, 1989; Lintz and Anderson 1989; Nowak and Kantner 1991; Zier 1989). This conclusion is supported by recent excavation data from stratified rock shelters with radiocarbon dated deposits that overlap the end of the Archaic stage and the beginning of the Late Prehistoric stage. These results emphasize overall continuity in material culture and adaptation (Zier 1989; Zier and Kalasz 1991; Kalasz et al. 1993). It is further asserted by southeastern Colorado archaeologists, both past and present, that general abandonment of the region on a large scale occurred by the middle of the A.D. fifteenth century. Abandonment of the Arkansas River Basin by this long-lived indigenous culture was followed by, or perhaps corresponds with, an incursion of Athapaskan populations from the north (Campbell 1969a, 1976; Eighmy 1984; Gunnerson 1987, 1989; Lintz and Anderson 1989; Lintz 1989; Kingsbury and Nowak 1980). The arrival of the Athapaskans has traditionally signaled commencement of the Protohistoric period in the area.

In the years between the end of the Late Archaic period and the end of the Diversification period it has been proposed that the context area was characterized by progressive increases in population (Campbell 1969a:398; Eighmy 1984:112; Kalasz 1988:126; Lintz and Anderson 1989:19; Reed and Horn 1995:25,191). Although there are several important caveats, the distribution of absolute dates presented above at least suggests that the onset of the Late Prehistoric stage was accompanied by increases in regional population. Equivocal support for this hypothesis can be found in stratified rock shelters which contain both Archaic and Late Prehistoric components. Although the density of cultural material in Recon John Shelter and Two Deer Shelter suggests that human activity increased during the Developmental period, at Gooseberry Shelter it is during the Late Archaic period that the greatest densities of artifacts occur (Kalasz et al. 1993; Zier 1989; Zier et al. 1996a). As with the radiocarbon age distribution, consideration of certain qualifiers is appropriate for the stratified rock shelter data. It is likely that geomorphic factors such as soil formation processes in this type of setting affect the distribution of artifacts and their interpretation. For example, the accumulation of sediments may occur at different rates depending on a rock shelter's location, and those sites characterized by slower rates may result in greater relative concentrations of archaeological debris (Zier et al. 1996a:200).

Perhaps the most persuasive argument for population increases prior to the Protohistoric period is found in the ubiquity of Diversification period architectural sites, many of which feature multiroom structures (Andrefsky 1990; Gunnerson 1989; Kalasz et al. 1993; Kalasz 1988, 1989; Loendorf et al. 1996; Mitchell 1997; Nowak and Kantner 1990; Reed and Horn 1995; Van Ness et al. 1990; Wood and Bair 1980; Zier and Kalasz 1985; Zier et al. 1988). These rock wall structures are often thought to reflect increasing levels of sedentism and population throughout the context area. Numerous examples of these sites are found across the area including those excavated on Fort Carson (Kalasz et al. 1993; Zier and Kalasz 1985; Zier et al. 1988); along the Apishapa River (Gunnerson 1989); in the Carrizo Creek area (Kingsbury and Gabel 1980; Kingsbury and Nowak 1980; Nowak and Berger 1982; Nowak and Kantner 1990); in the Chaquaqua Plateau area (Campbell 1969a); along the tributaries of the Purgatoire River in the PCMS (Andrefsky 1990; Andrefsky et al. 1990; Loendorf et al. 1996); in the Picket Wire Canyonlands (Reed and Horn 1995); and in the Park Plateau region (Campbell 1984; Lutes 1959a, 1959b; Wood and Bair 1980).

Although the number of Late Archaic and even Developmental period structures pales in comparison with Diversification period structures, site visibility is undoubtedly a factor. Diversification period architecture is often substantial and visible on the surface, yet the few examples of Late Archaic architecture in the context area tend to be basin houses or low, buried

rock foundations (Mitchell 1997; Rood and Church 1989; Rood 1990; Shields 1980). Structures that feature substantial above-ground foundations are known in the Developmental period but relatively few have been recorded in the context area; considerably more are known in the adjacent northeastern New Mexico vicinity (Biella and Dorshow 1997a; Hunt 1975; Loendorf et al. 1996). Given the number of Archaic and Developmental period basin houses known from the surrounding plains and intermountain West (Kalasz and Shields 1997; Metcalf and Black 1991; Shields 1998; Tucker et al. 1992), the few examples that have been recorded in the Arkansas River Basin could be related to either sampling and geomorphic factors, or a combination of both. For example, the profusion of Archaic basin houses discovered in Wyoming is probably a function, at least in part, of the numerous energy-related archaeological projects in that region; as noted in Chapter 3 of this volume, a similar level of contract-related excavation data is currently not available in the context area. To summarize, a dramatic increase in population, which peaked in the Diversification period, is certainly indicated based on the current information. However, the potential for discovery of additional Archaic occupations, presumably deeper and more difficult to locate, cannot be discounted.

Technology

Late Prehistoric stage technological trends are largely perceived through observations of the context area's best-represented artifact classes: lithic, ceramic, and bone tool and ornamentation. With regard to pottery, a range of Puebloan and plains ceramics has been recorded in the context area. For the most part it is not known which ceramics recovered from Arkansas basin contexts were imported and which were manufactured locally; confirmation of local manufacture is inhibited by the lack of regional petrographic and elemental analyses. Where such studies have been undertaken, the data indicate that exchange was an important factor in ceramic assemblage content and variability (Mitchell 1997). Wares recorded in the context area are largely restricted to cord-marked, plain, incised, polished, micaceous, corrugated, and painted varieties. Two additional wares, vertically indented and wiped, were reported at the Avery Ranch site (for examples and definitions see Zier et al. 1988 and Hummer 1989; for additional examples of pottery types see Andrefsky 1990; Ellwood 1995; Gunnerson 1989; Jepson et al. 1992; Kalasz et al. 1993; Mitchell 1997; Van Ness et al. 1990; Watts 1971; Wood and Bair 1980; Zier and Kalasz 1985; Zier 1989; Zier et al. 1996a; Zier et al. 1996b). Developmental period pottery is apparently limited to cord-marked wares believed to have been influenced by, or traded from, Central Plains Woodland groups, and local brown wares associated with the upper Purgatoire River region. Known developmental period sites tend to have small, uniform ceramic assemblages; it is also notable that pottery is virtually absent at some Developmental period base camp sites (Hand and Jepson 1996; Loendorf et al. 1996:58-116). In contrast, the Diversification period witnessed the appearance of all ware types noted above. Influences or trade associated with an increasing number of ceramic traditions, including Puebloan, Athapaskan, and Plains Village, are therefore apparent prior to the Protohistoric period (Campbell 1969a:353-354; Ellwood 1995; Hummer 1989).

Current analytical methods do not permit chronological ordering of cord-marked wares on the basis of morphological attributes. Developmental period cord-marked ceramics cannot be confidently distinguished from those that were manufactured during the Diversification period on the basis of construction techniques or style. The distinction between deep and shallow cord marks on Chaquaqua Plateau specimens was employed by Campbell (1969a:354) to differentiate "Woodland cord-marked ware, or deep cord-marked" from "Borger cord-marked ware." Inexplicably, Campbell (1969a:114) offered cord-mark morphology as a means of chronologically ordering this type of pottery despite his assertion that "the variations could have been incorporated into one pot." Similarly, Ellwood (1995:132-133) has more recently drawn a distinction between earlier and later vessels on the basis of deep versus fine or obliterated cord-marking. She does,

however, caution that "further observations are required before this hypothesis can be verified" (Ellwood 1995:133). Hummer (1989:366), in discussing ceramics from the PCMS, weighs in on the matter by stating that "both shallow and deep cordmarks can occur on the same vessel; the shallower and sometimes completely obliterated impressions frequently occur near the vessel's base."

Phase-level ceramic distinctions within the Diversification period are better understood than those advanced for the Developmental period. Whereas the Sopris phase is characterized by intensive ceramic exchange with the northern Rio Grande valley, Apishapa phase ceramics exhibit attributes such as crushed rock temper and cord marks that are typical of the Plains Village tradition. Some overlap is apparent in the recovery of cord-marked ceramics at Sopris phase sites and Southwestern sherds at some Apishapa sites. The relationship of the polished wares found on both Apishapa and Sopris sites is a matter that needs further exploration. Both phases are characterized by several sites with large numbers of sherds, including 5LA1211 and 5LA1416, and the Cramer, Snake Blakeslee, Ocean Vista, and Avery Ranch sites (Kalasz et al. 1993; Gunnerson 1989; Ireland 1968; Wood and Bair 1980; Zier et al. 1988). However, there are a number of Apishapa phase architectural sites for which low numbers of ceramics have been reported (Nowak and Kantner 1991:160-161; Loendorf et al. 1996:301, 310).

Micaceous wares are thought to have been produced by Protohistoric period Apaches (Campbell 1969a:355), although as Hummer (1989:368) notes, "Temporal assignment of the micaceous wares is problematical as they could potentially represent ceramics from eastern Puebloan groups (i.e., Taos, Picuris) or various Apachean groups (i.e., Dismal River, Navajo, Jicarilla) or their ancestors...." Investigations in the Carrizo Creek area indicate that Puebloan polychrome trade wares also enter the context area with the advent of the Apachean groups (Kingsbury and Gabel 1980:6-7).

Interpretations of Late Prehistoric chipped stone are comparable to or perhaps even surpass those of ceramics in terms of their complexity. Difficulties arise in comparing chipped stone reduction strategies among Late Prehistoric sites because of substantial variability in the analytical orientation of investigations spanning more than sixty years. Chipped stone analyses range from computer-generated multivariate approaches to highly subjective inspectional analyses. Both have their advantages and disadvantages, but those analyses characterized by minimal or no definition of classes and categories are of little value.

Generally, Late Prehistoric stage chipped stone technology appears to be a continuation of that associated with the Archaic stage; this situation is probably a reflection of their common origin and basic hunter-gatherer tool kit. Lithic data from Archaic and Late Prehistoric deposits at Recon John Shelter, Gooseberry Shelter, and Two Deer Shelter at Fort Carson suggest remarkable uniformity in chipped stone reduction strategies as well as overall tool morphology (Zier 1989; Kalasz et al. 1993; Zier et al. 1996a). Both Archaic and Late Prehistoric occupations at these shelters exhibit the co-occurrence of two disparate reduction strategies, i.e., the production of well-crafted formal bifaces as well as expedient or informal flake tools (Kalasz et al. 1993; Zier 1989).

More specific temporal trends in chipped stone tool form are generally restricted to projectile point morphology. The most obvious is the reduction in projectile point size due to the introduction of the bow-and-arrow. The standard perception that a plethora of large, corner-notched Late Archaic period varieties gradually give way to small, corner-notched varieties during the Developmental period has not changed with more recent investigations (Anderson 1989a:232-233; Zier 1989). The larger, Archaic stage dart points consistently appear in Late Prehistoric stage contexts, albeit in low quantities, and co-occur with presumed arrow points (Dwelis et al.

1996:Figure 6d; Hoyt 1979:Figure 6; Hunt 1975:Figure 6d, e; Loendorf et al. 1996:89; Nowak and Kingsbury 1981:Table 1; Nowak and Berger 1982:9; Rhodes 1984:Figures 60-62; Van Ness 1989:61; Zier 1989: Figures 31, 51, Table 17). The persistence of large, corner-notched styles in Late Prehistoric stage contexts is believed to reflect overlapping use of the atlatl and bow-and-arrow (Campbell 1969a:370; Eighmy 1984:111; Loendorf et al. 1996:226-227). However, other factors such as the collection and reuse of Archaic points as knives or scrapers by Late Prehistoric groups should be further explored. Most Archaic-style point specimens recovered from Developmental period contexts at the Magic Mountain site near Denver exhibited evidence of use wear and resharpening (Kalasz and Shields 1997:144).

Evidence continues to accumulate indicating that the small, triangular corner-notched projectile points of the Developmental period (e.g., Scallorn) are largely replaced by small, triangular side-notched varieties (e.g., Reed and Washita) sometime during the subsequent Diversification period, perhaps the later portion (Anderson 1989a:234; Kalasz et al. 1993:84; Nowak and Kantner 1991:58; Rhodes 1984:Figures 56-59; Zier et al. 1988:Figure 44). Anderson (1989a:234) suggests that small flange-stemmed points reflect the development of a new hafting method designed to facilitate exploitation of the Southern Plains bison herds, which are believed to have dramatically increased in size at approximately A.D. 1000. "The wide base on the flange points may have provided the necessary strength needed for the removal of intact arrows embedded deep in the flesh of large mammals such as bison" (Anderson 1989a:234). The limited evidence available for subsequent Protohistoric period projectile point associations suggests that the small, side-notched point continued to be pervasive (Anderson 1989a:234; Kingsbury and Gabel 1980:9-10). Small, corner-notched point styles are also believed to have been used during the Protohistoric period but the large, dart-sized varieties apparently were not (Anderson 1989a:234).

After chipped stone, ground stone implements are probably the most common class of artifact found in the Arkansas River Basin. In addition to more portable implements such as the typical mano and metate, fixed bedrock and boulder grinding surfaces are well-known in the context area. As with chipped stone, data from stratified rockshelters indicate overall uniformity in ground stone manufacture and morphology through the Archaic stage and subsequent Developmental period occupation. More formally shaped manos and basin metates are certainly present, but most ground stone implements found in the context area appear to represent an expedient tool technology (Gunnerson 1989; Loendorf et al. 1996:107-108; Zier 1989:174), or "...what is perceived as a throw-away attitude toward this class of artifacts" (Van Ness et al. 1990:255). As summarized in a description of ground stone collected along Turkey Creek at Fort Carson, this situation may be due in part to the availability of the most common raw material used for ground stone manufacture: "The raw material for grinding tools -- sandstone -- is so easily obtainable in the area that the maintenance and longevity of such tools does not appear to be of much concern. Even exposed bedrock and talus provide ready surfaces for grinding tasks and are commonly utilized" (Van Ness et al. 1990:255). The dearth of formal patterning in ground stone morphology has to date restricted the discernment of meaningful trends in their use and manufacture during the shift from the Archaic to Late Prehistoric stage. The best-known attempt was associated with Harvard University's excavations at the Magic Mountain site. Although Irwin-Williams (1963) and Irwin-Williams and Irwin (1966) offer their Magic Mountain site ground stone typology as means of discerning temporal trends in tool form, their results have never been independently confirmed. Furthermore, recent investigators have noted some weaknesses in the methods employed to define the Magic Mountain ground stone types (Kalasz and Shields 1997:15-16).

The large, combined ground stone collections from PCMS and Fort Carson demonstrate morphological similarities over broad portions of the context area (Bender 1990; Jepson et al.

1992; Van Ness et al. 1990; Zier et al. 1996a). With the exception of Sopris phase sites (Wood and Bair 1980:152-158), metates do not display the patterned formal shapes, such as the trough form, typical of those found in the Southwest. Although some well-shaped, deep oval basins are known, metates are generally thin, flat slabs that exhibit minimal modification. This trend is apparent with Sopris phase sites as well, but as noted before, trough metates are more common. Late Prehistoric stage manos from the context area, regardless of period or phase association, appear to reflect greater time investment in shaping than do metates. Ground cobbles, also known as manos or handstones, are generally small and ovoid. The length of the grinding surface is generally less than twice the width. Most handstones are less than 12 to 15 centimeters in length and are therefore commonly referred to as "one-hand manos" in the literature. Both unifacial and bifacial varieties are common. Bifacial varieties in particular exhibit margins that are shaped by pecking and battering (Van Ness et al. 1990). The Sopris phase sites of the Diversification period are distinct from those of the Apishapa phase in that two-handed manos are much more common (Mitchell 1997:99). Also of note are the distinctive edge ground or "keeled" mano forms that are common at the PCMS and, apparently to a lesser extent, Fort Carson (Bender 1990; Jepson et al. 1992; Van Ness et al. 1990; Zier et al. 1996a).

Considerable evidence has accumulated demonstrating that a well-developed bone tool and bead industry spans the Archaic and Late Prehistoric stages (see Erdos [1998] for a detailed review of bone and shell bead industries in southeastern Colorado). Awls and tubular bone beads were recovered from both Archaic and Late Prehistoric deposits at Carrizo Rock shelter; all the beads were manufactured from bird bone (Kingsbury and Nowak 1980:22-23). Similarly, bone tools and beads were recovered from both Archaic and Late Prehistoric stage contexts at Recon John Shelter, Moonshine Shelter, and Wolf Spider Shelter (Hand and Jepson 1996:83-91; Tucker 1991; Zier 1989:193-197) (see also Chapter 6, this volume). Most of these artifacts were recovered from Developmental period contexts rather than the underlying Archaic stage deposits. At these sites the bead collection was manufactured entirely from leporid (cottontail and jack rabbit) or indeterminate small mammal bone rather than the bird bone used at Carrizo Rock shelter. Further, all but a few of the awls at Recon John and Wolf Spider shelters were made from indeterminate large mammal or artiodactyl bone. This particular pattern was also noted at Torres Cave in the Chaquaqua Plateau area (Hoyt 1979:14-15). Though awls were made from large or medium mammal bone, beads were manufactured from leporid or indeterminate small mammal elements. The cultural strata at Torres Cave are believed to be primarily Developmental period in age.

As with ceramics, the quantity and variability of bone tools and ornaments increase at some Diversification period architectural and rockshelter sites (Campbell 1969a; Gunnerson 1989; Kalasz et al. 1993; Ireland 1968; Nowak and Kantner 1991:135; Rhodes 1984; Wood and Bair 1980; Zier et al. 1988). The Cramer and Snake Blakeslee sites and Upper Plum Canyon Rock shelter I, all of which have been assigned to the Apishapa phase, feature especially impressive quantities of bone tools, and to a lesser extent, beads (Gunnerson 1989; Rhodes 1984). Sopris phase sites such as the Leone Bluff site and the Sopris site (5LA1415) are similarly characterized by large ceramic assemblages and bone industries (Wood and Bair 1980:163-173). A continuation of earlier production strategies is suggested by the manufacture of beads from small to medium mammal and bird bone and the use of large mammal long bone and rib elements for tools such as awls, wrenches, spatulas, knives, scrapers, and digging sticks. However, the selected Apishapa phase sites with large bone tool and ornament assemblages emphasize the use of bison, whereas the Sopris phase examples do not.

The Late Prehistoric material culture of high-altitude portions of the context area is known from excavation of only a limited number of sites. The assemblages from the Campion Hotel site and site 5LK6, both on Lower Twin Lake, are varied and include lithic, ground stone, and bone

artifacts, as well as one ceramic sherd from the former site (Buckles 1979). The lithic collections display a wide range of formal and expedient tool types including projectile points, large bifaces, formal scrapers, burins, chopping tools, and abundant flake tools. Microtools are common, suggesting a continuation of the long-standing microtool industry that characterizes the Mountain tradition from the terminal portion of the Paleoindian stage through the Archaic stage (Black 1991). Lithic debitage is also common and includes many resharpening flakes. Late Prehistoric projectile points at the two sites, though morphologically variable, are noted as similar in style to so-called Hogback points from the foothills. They are small arrow points and exhibit corner notches, long barbs, expanding stems, and frequently, convex blade edges (Buckles 1979:24). Both manos and metates are present at the Lower Twin Lake sites but little information is available. The bone tool assemblage suggests that a well-developed industry was in place. Found were several awls manufactured from mammal long bone, and hollow bone beads derived from unknown elements. The single ceramic sherd from the Campion Hotel site is of an unidentified plain ware, and according to Buckles (1979:62) could be of Ute affiliation. Puebloan ceramics on the surface at the Trout Creek Pass quarry suggest use of this site during Protohistoric times, ca. A.D. 1500-1700 (Chambellan et al. 1984:69).

Settlement and Subsistence Strategies

Most attempts to define the structure of settlement systems and subsistence strategies in the Arkansas River Basin have relied almost exclusively on survey data (Alexander et al. 1982; Andrefsky 1990; Campbell 1969a; Eddy et al. 1982; Jepson et al. 1992; Loendorf and Loendorf 1999; Lutz and Hunt 1979; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a). Even though conclusions are tentative (see Chapter 4, this volume) and subject to verification through excavation, a number of important trends have been identified. Furthermore, since the publication of the previous research context for eastern Colorado (Eighmy 1984), a number of large- and small-scale excavation projects have been completed at Fort Carson, on the Bucci Ranch in Huerfano County, on Carrizo Ranches property in Baca and Las Animas counties, on the Chaquaqua Plateau, and at the PCMS (Andrefsky et al. 1990; Charles et al. 1996; Kalasz et al. 1993; Loendorf et al. 1996; Nowak and Fiore 1987, 1988; Nowak and Headington 1983; Nowak and Jones 1984, 1985, 1986; Nowak and Kantner 1990, 1991; Nowak and Spurr 1989; Rhodes 1984; Schiavitti et al. 1999; Zier 1989; Zier et al. 1988; Zier et al. 1996a; Zier et al. 1996b; Zier and Kalasz 1985). Excavation data from these projects provide a more detailed view of the wide range of site types identified through survey of the context area. These data therefore fill in some important gaps in the understanding of Late Prehistoric stage settlement, particularly with regard to subsistence and site function. However, the excavated site sample remains meager, and in particular very few large-block excavations have been undertaken. In light of this situation, archaeologists working in the context area are cautioned not to stretch the interpretive value of any single excavated site.

Although considerable new data are available for settlement research in the context area, much of it relates to the Developmental period and the Apishapa phase of the Diversification period. There is little new information about the Protohistoric period acquired since publication of the previous research context, and Sopris phase settlement research has been advanced largely through work in northeastern New Mexico (Biella and Dorshow 1997a; Campbell 1984; Eighmy 1984; Kershner 1984). The lack of information about Protohistoric period settlement systems can be partially attributed to uncertainties about what constitutes artifacts and features diagnostic of that period. Spaced stone rings are frequently thought to be the quintessential indicator of Protohistoric and early Historic occupations. However, data from the Dry Cimarron River valley (Winter 1988), the PCMS (Andrefsky et al. 1990; Loendorf et al. 1996), and the Carrizo Ranches (Nowak and Kantner 1991) suggest that this feature type may have been in use earlier. Similarly, triangular, side-notched Washita points are thought to represent Protohistoric period sites,

although they also appear on Apishapa phase sites. The only unequivocally diagnostic artifacts and features are metal projectile points and Biographic-style rock art, both of which are relatively rare.

The Sopris phase of the Diversification period is still represented in the context area primarily by a few prominent architectural sites confined to the Park Plateau. In the years following the major survey and excavation projects at Trinidad Lake and in the Purgatoire and Apishapa highlands (Hand et al. 1977; Ireland 1970, 1973a, 1973b, 1974a, 1974b; Lutz and Hunt 1979; Wood and Bair 1980), there have been a number of energy- and highway-related survey and testing projects on the Park Plateau (Dore 1993; Gleichman 1983; Indeck and Legard 1984; McKibbin et al. 1997; Rood and Church 1989; Tucker 1983). These projects are small in scale when compared to either the earlier Park Plateau projects or military-related investigations to the east and north. They do not have the large site samples conducive to generation of overall settlement syntheses, and are more spatially restricted in their interpretation of site distributions. To date the only major synthetic work pertaining to the Park Plateau and Sopris phase archaeology is a reexamination of pottery collected during previous investigations (Mitchell 1997). In discussing Sopris phase settlement, Mitchell (1997:69) notes that "The Sopris phase began with the appearance of homesteads and hamlets along terraces above the Purgatoire River and its tributaries. Because intensive survey and excavation efforts have been limited to a relatively small portion of the area, little is known about site function variability or the total geographical range of the Sopris phase."

Site Types and Locational Variability

Currently, no other portion of the context area has been subjected to the level of settlement investigation that is associated with Fort Carson, PCMS, and the Picket Wire Canyonlands (Alexander et al. 1982; Andrefsky 1990; Jepson et al. 1992; Kalasz 1988; Loendorf and Loendorf 1999; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a; also see Chapter 3, this volume). The more recent contract work is a welcome addition to the pioneering settlement research in the 1960s on the Chaquaqua Plateau by Campbell (1969a). Previous and ongoing archaeological investigation in these areas has provided an extensive database for examination of matters related to settlement patterns and settlement-subsistence strategies. All of these studies indicate the pervasiveness of Late Prehistoric stage occupation, and note that this situation may be due to erosional factors, site visibility, or alternatively, increasing population. None, unfortunately, encompasses the nearby Park Plateau or foothill regions of the context area; this situation has inhibited the formation of an overall synthesis of settlement within the Arkansas River Basin.

Campbell's (1969a) work on the Chaquaqua Plateau provided a solid foundation for subsequent research into Archaic and Late Prehistoric settlement in the plains and canyon regions of the context area. Sites recorded through survey were initially divided into types defined on the basis of setting (open or sheltered) (Campbell 1969a:320-343). Further division is based primarily on the presence or absence of features. Sites without fire-related features or architecture were termed utilized areas; these consisted of loci believed to represent quarries and workshops. Surface encampments had no architecture but exhibited evidence of "heating or firing activity" and were often characterized by multiple hearths or roasting pits and large, diverse artifact assemblages (Campbell 1969a:330). Open or unsheltered architectural sites were divided into a number of categories: stone enclosure, slab enclosure, walled or fortified enclosure of stone and slab, stone wall, spaced stone arrangement, spaced stone ring, and ring of earth and stone.

Dating sites primarily by relative means (e.g., diagnostic artifacts such as projectile points and ceramics) and recording their spatial distribution enabled Campbell (1969a:417-419) to form his conclusions regarding Chaquaqua Plateau settlement pattern. Campbell believed that Late

Archaic period occupations were confined to the canyons, and that rockshelters were the preferred habitation settings. During the subsequent Developmental period, bison first played a prominent role in subsistence, and hunting forays into the broad, open plains escalated. Further, a population increase is suggested and free-standing architecture in upper and lower canyon settings replaced rockshelters as winter quarters. Toward the end of the Developmental period, the number of stone enclosures increased and their locations seemed to shift toward lower and wider canyons. Campbell believes that these trends reflected an increased reliance on maize horticulture. Architecture increased sharply in the subsequent Apishapa phase, and population may have reached a peak at that time (Campbell 1969a:419). "Horticulture becomes a fundamental part of the subsistence pattern during Apishapa times ... All large sites and sites with structures are found in the proximity of arable land" (Campbell 1969a:391). The large, multiroom structures located in precarious, "defensive" canyon rim settings are believed to have been built during this time. The gradual abandonment of the region by Apishapa phase populations started in the fourteenth century and was believed to have been brought on by warfare, deteriorating climatic conditions, overpopulation, or some combination thereof. Tipi rings indicative of Protohistoric Apache appear in canyons and mesas during the fifteenth century (Campbell 1969a).

The site types defined for recent survey projects have been based largely on surface lithic assemblages and/or feature types (Alexander et al. 1982; Andrefsky 1990; Jepson et al. 1992; Kalasz 1988; Lutz and Hunt 1979; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a). However, the manner in which survey data were manipulated to define these site types varies greatly according to project. The largest site sample was generated by surveys of the PCMS in 1983, 1984, and 1987 (Andrefsky 1990). A population of 1,442 sites was divided into 77 functional site types (Andrefsky 1990:XIV-7). Site types were defined on the presence or absence of seven descriptive functional characteristics: wood working, plant and/or seed grinding, hunting and butchering, lithic tool manufacture, architecture, fire features, and a nonspecific function category. Fire feature and architecture functional characteristics are self-explanatory; any site with a structure or a hearth was assigned these functions. The remaining functions reflect the presence of artifacts subjectively assessed to be representative of particular tasks, e.g., any sites with manos, metates, and/or bedrock ground stone features were considered to have the plant/seed grinding function. The distribution of site types was subsequently examined with respect to temporal period and physiographic zone. The results of the study were summarized as follows. "The PCMS data indicate one primary overriding characteristic. That characteristic is simply a continuity through time in settlement and subsistence. There appears to be very little change in what prehistoric people were doing or where they were living within the PCMS area. Such continuity through time is not an altogether surprising situation. Michlovic (1986) suggested that the entire Plains region shows no true cultural evolution and that changes in the artifact assemblage such as pottery and the bow-and-arrow were diffused traits, which were accepted into the population but had little impact on the overall settlement and subsistence systems" (Andrefsky 1990:XIV-22).

Surveys of smaller scale in the Picket Wire Canyonlands and at Fort Carson resulted in settlement pattern studies that were more restricted in terms of the range of physiographic settings (Jepson et al. 1992; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a). None of these surveys featured the overall diversity and range of physiographic setting that characterized the PCMS investigations, particularly with regard to the broad expanses of gently rolling plains. Viewed together, however, they reveal some simple yet interesting trends in settlement, particularly with respect to architectural sites. Again, it is reiterated that relatively dated Late Prehistoric stage sites are pervasive in these smaller studies. The Fort Carson surveys emphasized locations near or along larger drainages, including shallow canyon settings, that were in relative proximity to the foothills of the Rocky Mountains. In contrast, the Picket Wire Canyonlands

survey was situated in the deep canyons of the Purgatoire River well to the east of the mountain front.

Rather than create site types based on specific functional tasks, these surveys emphasized assessments of overall site complexity. The Picket Wire Canyonlands sample was characterized by a mix of architectural and nonarchitectural sites (Reed and Horn 1995:79-81). Applying Binford's (1980) collector/forager terminology, the presence or absence of architecture was used as a basis for classifying sites as residential bases (architectural), field camps (nonarchitectural), and locations (nonarchitectural). Subjective assessments of the number and diversity of artifacts, features, and rock art were used as a basis for additional classification within these major headings, e.g., simple and complex habitation sites were subsequently defined within the residential base grouping. Architectural sites made up a comparatively small percentage of the overall Fort Carson site samples (Jepson et al. 1992; Van Ness et al. 1990; Zier et al. 1996a). Therefore a quantitatively oriented multistage approach was employed that initially emphasized lithic artifacts, the most common class recovered. Sites were distinguished as large or small and simple or complex on the basis of the size and nature of associated lithic assemblages. Variability in ceramics, architecture, and nonarchitectural feature variability was subsequently identified among the lithic site categories. Despite the different approaches to creating site types, the combined data suggest that architectural sites occur more often in the Purgatoire River region than at Fort Carson to the northwest. As discussed in Chapter 4, architecture is usually perceived as a reliable indicator of increased sedentism. For reasons that yet need to be explored, 95 sites in the Picket Wire sample (36 percent of the 263 sites) exhibit architecture (Reed and Horn 1995:Table 6-2). In stark contrast, at Fort Carson just 13 sites (7 percent of the 186 site sample) from the three selected surveys have structures. The 13 sites include Ocean Vista (5PE868), which was recorded as nonarchitectural during the survey (Van Ness et al.1990); architecture was subsequently exposed during testing (Kalasz et al. 1993). It is notable that 52 individual structures (as in rooms) are associated with the 13 Fort Carson architectural sites, while 288 individual architectural units are represented by the 95 Picket Wire architectural sites. This situation minimally suggests that the deep Purgatoire River canyons of the context area are characterized by a greater degree of sedentism or, alternatively, a longer history of semisedentary adaptations.

An earlier study of PCMS settlement patterns was entirely restricted to observations of architectural site types within the Taylor Arroyo drainage basin, a northern tributary of the Purgatoire River (Kalasz 1988). Architecture was relied upon for this settlement study because analyses of lithic and other data sets were, at the time, not yet complete or were fraught with problems related to sampling and analytical methods. Taylor Arroyo sites were therefore classified based on the number and type of architectural unit or "room" level associations. The architectural typology on which the Taylor Arroyo site classification is based was developed to assess the temporal bounds of PCMS structures (Kalasz 1988, 1989, 1990). Complex architectural sites were designated "population coalescence communities," and simpler architectural sites were designated "specialized task communities." The Taylor Arroyo drainage basin encompasses a wide range of PCMS physiographic zones. Moving north to south through the Taylor Arroyo study area, one encounters upland mesas, broad plains grasslands, shallow upper canyons, and deeply incised middle and lower canyons. The confluence of Taylor Arroyo with the Purgatoire River lies approximately 25 km south of the Picket Wire Canyonlands. A particularly high percentage of the Taylor Arroyo architectural sites is relatively dated to the Late Prehistoric stage and, as with the Picket Wire and Fort Carson samples, is believed to have been occupied during the Developmental period or succeeding Apishapa phase. Ninety-four sites (21 percent of the of the Taylor Arroyo site sample of 439) exhibit architecture; this percentage is midway between the architectural site percentages drawn from the Fort Carson and Picket Wire surveys. The Taylor Arroyo study emphasizes that the stone enclosure architectural sites typical of the region's Late Prehistoric stage, including the multiple-room structures, were not restricted to defensive canyon

locales as was suggested by Campbell's research. Of the five physiographic zones, only the mesas had no associated architectural sites. However, the trend noted in the Picket Wire Canyonlands settlement study is supported by the Taylor Arroyo research. In terms of acreage, the mesas and plains comprise 92.3 percent of the study area. Although the canyons comprise only 7.7 percent of the total acreage, nearly half of the entire site sample and fully 68 percent of the architectural sites are situated in these settings.

The PCMS, Fort Carson, Chaquaqua Plateau and Picket Wire Canyonlands surveys together underscore a number of settlement trends applicable to a significant portion of the context area. These trends include the pervasiveness of Late Prehistoric settlement in canyon settings, site locations indicative of resource exploitation in all environmental zones, and the presence of a wide range of architectural and nonarchitectural site types, suggesting considerable functional diversity. The pioneering settlement research of Campbell remains valid today in many respects, particularly with regard to the temporal affiliations of architectural sites and their spatial distributions. More recently amassed data corroborate Campbell's settlement study in that there is a strong tendency for architectural sites to be located in canyon settings and to be affiliated with the Late Prehistoric stage. However, as will be discussed in greater detail below, there is much more variability in architectural site location, morphology, and function than had been suggested previously.

Rock art sites are common in the context area, particularly in the dissected canyon country of the lower Purgatoire River region. Because of the imprecision attendant to dating of most rock art (see discussion in Chapter 4), this type of site is described in this general Late Prehistoric discussion rather than in the context of the individual periods within the stage. This Purgatoire Petroglyph Style of rock art is most closely associated with the two earlier periods of the stage. This style, as well as a complementary style of pictographs, was originally defined by Cole (1984:16-24). In a reevaluation of Cole's data, Loendorf (1989:354-359) and Loendorf and Kuehn (1991:280-282) argue that the style should be redefined, and that clearer distinctions should be drawn between Pecked Representational and Purgatoire Petroglyph Style motifs. The central motif of the latter is a full-view anthropomorph. Characteristically, such anthropomorphs are depicted with digitate hands and knobby knees. Some elements are phallic, but few include horns, headdresses, or other cephalic appendages. Large numbers of quadrupeds are frequently depicted in association with these anthropomorphs. Purgatoire Petroglyph quadrupeds tend to have rectangular bodies, straight legs, and poorly formed heads. In some cases antlers are not depicted, yet in others, well-executed branching antlers are shown. Abstract elements, principally meandering curved lines, are also included in this style. An atlatl motif, depicted as a bisected or tailed circle, may also be included. A similar inventory of motifs, executed in red pigments, defines the contemporaneous Purgatoire Painted Style. Both styles are believed to date to the Late Prehistoric stage, from approximately A.D. 100 to 1400. Both are thought to postdate the earliest Pecked Representational Style images. The consistent association between Purgatoire Petroglyph Style rock art and architectural forms dating to the late Developmental or Diversification periods supports a Late Prehistoric assignment for these styles. In any case, elements assignable to the Purgatoire Petroglyph Style, and to a lesser extent the Purgatoire Painted Style, are among the most common rock imagery motifs in the context area. Some of the better known examples include the Zoo Keeper site (Loendorf 1992b), the Cross Ranch site on the PCMS (Loendorf and Kuehn 1991), and the 5LA1023/5LA5840/5LA5841 complex in the Picket Wire Canyonlands (Reed and Horn 1995).

Several rock art styles are associated with the Protohistoric and Historic occupation of the Arkansas River Basin. Among these, the oldest is known as the Rio Grande Style (Cole 1984:25-26; Loendorf 1989:359-361; Loendorf and Kuehn 1991:282-283). This style has also been termed the Regional Style by Faris (1995), who argues that a number of characteristic motif attributes are derived from plains sources, rather than from the middle and northern Rio Grande. The central

motifs of the Rio Grande or Regional Style include both outline-pecked and solid-pecked anthropomorphs, often shown with horns or masks; shields and shield-bearing warriors; and a large variety of quadrupeds. Anthropomorphs are frequently depicted bearing weapons. The primary quadruped depicted is the bison, occasionally shown with a heart line. Other motifs include corn plants and herons (Reed and Horn 1995). In some instances images are created through the use of "negative space:" patina is removed from the rock surface surrounding the figure, leaving a dark image on a lighter background. Although it is unclear which elements or attributes of Rio Grande Style imagery can be attributed to middle and northern Rio Grande groups, and which to plains groups, images of this type appear to date to the Protohistoric period, or roughly A.D. 1500 to 1750. Rio Grande Style rock art is generally thought to be the work of Apache artists; significantly, Loendorf and Kuehn (1991) interpret certain anthropomorphs as Apache gan dancers. This interpretation is generally supported by Protohistoric period cation-ratio dates for Rio Grande Style elements. Sites which contain this style of imagery have been recorded on the PCMS (Sue Site) and in the Picket Wire Canyonlands (5OT339 [Reed and Horn 1995]).

The most recent style of aboriginal rock art in the Arkansas River Basin has been termed the Plains Biographic Style (Cole 1984:26-38; Keyser 1977, 1987; Loendorf 1989:361-362; Loendorf and Kuehn 1991:284). This style actually incorporates a variety of types and styles manufactured during the late Protohistoric and Historic periods. The hallmark of this style is the depiction of horses and riders, as well as European and American material culture, principally rifles. The earliest examples are collectively known as Ceremonial Rock Art, and are characterized by the incised depiction of shield-bearing warriors, V-necked anthropomorphs, and rectangular-bodied anthropomorphs (Keyser 1987). Estimated dates for Ceremonial Rock Art in the Northern Plains span the period between A.D. 1000 and 1700. The earliest Ceremonial Rock Art may therefore predate the introduction of the horse to Plains cultures, although relatively crude representations of horses may be important elements of what Keyser (1987:47) terms "proto-biographic" rock art. Some of the formal design motifs of Ceremonial and Rio Grande Style rock art overlap somewhat, including shield-bearing warriors and bison. However, Ceremonial Rock Art is nearly always incised, often deeply, whereas Rio Grande Style elements are generally solid pecked or outline pecked.

Site types and settlement strategies are poorly understood in the mountainous portions of the context area, and definition of overall patterns of settlement must await large-scale inventory of high-altitude areas. Information provided by Buckles (1979) suggests similar locational trends to those of the Archaic stage, and indeed the two excavated sites at Lower Twin Lake with Late Prehistoric components, Campion Hotel site and 5LK6, also have Late Archaic components, suggesting reuse of favored areas. These sites are situated on valley-bottom terminal moraines. The varied artifact assemblages and faunal remains indicate that they served as base camps at which a range of activities occurred including lithic manufacture/maintenance and faunal processing. Although the overall geographical distribution of high-altitude quarrying activity is unknown, it is apparent that the Trout Creek Pass quarry continued to be utilized during the Late Prehistoric stage, and evidently attracted people from outside the immediate upper Arkansas Valley region (Chambellan et al. 1984).

Economy

Late Prehistoric stage subsistence in the Arkansas River Basin is often distinguished from that of the Archaic by the development of a mixed or dual foraging and gardening economy. The degree of interpretive emphasis placed on foraging as opposed to horticulture depends on the investigator. The occurrence of maize has been associated with prehistoric occupations located throughout the eastern plains of Colorado. Campbell (1969a) recovered maize from Late

Prehistoric stage contexts on the Chaquaqua Plateau in quantities he felt were suggestive of increasing reliance on horticultural products. Horticulture there was suggested to have reached its zenith during the Apishapa phase. "There is reason to believe that the part played by gardening may have become more meaningful than foraging as a means of food acquisition" (Campbell 1969a:391). However, Campbell's (1969a:84-87) assessment of the importance of cultigens in Chaquaqua Plateau subsistence strategy is based largely on specimens recovered from just two rockshelters, Pyeatt and Medina.

Although no absolute dates were obtained from the various Trinchera Cave excavations, and associations between stratigraphy and specific artifact assemblages are questionable, the perishable artifacts recovered there provide some insight into the range of the Late Prehistoric stage economy. Maize was certainly a common occurrence, but additional materials such as arrow shafts, cordage, snares, basketry, and a variety of wild plant and game remains attest to the scope of the Arkansas River Basin hunter-gatherer economy (Simpson 1976). These data are supported by the more rigorously controlled excavations at Upper Plum Canyon Rock shelter I (Rhodes 1984).

In the ensuing years, micro- and macrobotanical evidence demonstrating the presence of maize has been recovered from a number of Developmental and Diversification period contexts in the Arkansas River Basin as well as a few that are Archaic in age (see Chapter 6, this volume). The remains of Developmental period cultigens are to date relatively rare occurrences (Kalasz et al. 1993; Zier 1989; Zier et al. 1996b), although they appear to be much more common in Park Plateau macrofloral assemblages than those from elsewhere in the basin (Biella and Dorshow 1997a; Kirkpatrick and Ford 1977; Mitchell 1997; Wiseman 1988). Significantly more evidence is available for Diversification period cultigens, at both Apishapa and Sopris phase sites (Campbell 1969a; Gunnerson 1989; Kalasz et al. 1993; Mitchell 1997; Rhodes 1984; Van Ness 1986; Wood and Bair 1980; Zier and Kalasz 1985; Zier et al. 1988). Although maize is certainly a consistent presence during the Developmental and especially the Diversification period, it does not appear to represent a principal element of the Late Prehistoric stage subsistence strategy.

Botanical remains recovered from a number of sites across the context area were summarized by Van Ness (1986). Included in this compendium were data generated from analysis of 157 pollen and 99 flotation samples. The samples were recovered from 5BA320 in the Carrizo Ranches area (Nowak and Jones 1986), the Avery Ranch site and Recon John Shelter at Fort Carson (Zier and Kalasz 1985), the Triple J site along the rim of Plum Canyon near the Purgatoire River (Baugh et al. 1986), and tested sites in the PCMS (Scott 1984). All of the pollen samples were recovered from the 13 PCMS sites; in addition, 64 of the flotation samples were taken from 19 PCMS tested sites. The Avery Ranch and Recon John Shelter results enumerated by Van Ness (1986) do not reflect the more extensive excavation results published after 1986 (Zier et al. 1988; Zier 1989). To date, this paper remains the only synthesis of botanical data from excavated prehistoric features at spatially and temporally disparate sites in the context area. The site sample represents occupations from both the northern and southern parts of the context area east of the mountains, and those dating to the Archaic as well as Late Prehistoric stage.

As is typical of the context area, samples collected from Late Prehistoric stage contexts dominate the results. Sopris phase sites, however, are not represented within the sample summarized by Van Ness (1986). The results are a dramatic counterpoint to Campbell's (1969a) assessment of the importance of maize horticulture in the Arkansas River Basin. Wild plant remains, especially goosefoot, rather than maize were by far the predominant botanical component of all samples (Van Ness 1986). Of the approximately 8,848 charred macrobotanical remains, 8,239 specimens (93 percent) were goosefoot seeds. Other prominent, charred, wild plant remains included purslane, pigweed, pea family, sunflower, and hedgehog cactus. By contrast, maize

remains from the samples are represented by 59 cob or possible cob fragments, 3 kernels, and 1 pollen grain. Most of the maize is associated with the Apishapa phase Avery Ranch site. Van Ness (1986:9) concludes, "It is suggested here that, above all else, more data needs to be collected and data from surrounding regions needs to be integrated. But, based on the evidence available at this time, corn appears to have been of limited importance during the Late Prehistoric of southeastern Colorado." More recent investigators propose that this situation may reflect prehistoric populations that were in the process of cultivating *Chenopodium* and other wild plants (Loendorf et al. 1996:123-125).

Perhaps the species that have not been commonly found in context area micro- and macrobotanical samples are of equal concern to what has been reported. The diverse environmental niches comprising the Arkansas River Basin, especially the canyons, include plants that are ethnographically known as important economic resources. Although a variety of fruits and nuts such as chokecherries, wild plums, currants, and skunkbrush commonly occurs in the region, they are only rarely recovered from archaeological contexts except on the Park Plateau. Whether this reflects a preservation problem has yet to be resolved.

Sopris phase sites, despite their obvious connections to Rio Grande valley Puebloans, display a similar mix of wild plants and domesticates (Mitchell 1997; Wood and Bair 1980). Wild plant remains commonly recovered from Sopris contexts include goosefoot, sunflower, and some species not typically found in other context area archaeological sites such as pinyon and chokecherry (Wood and Bair 1980). Wood and Bair (1980:214) conclude that "the vegetal diet of the Sopris Phase population consisted of predominantly native plant species ... maize is present in small amounts. This may indicate that horticulture was not practiced as a major means of subsistence." Mitchell (1997:99, Appendix C) argues convincingly that maize horticulture, however, was an important activity. As with the Apishapa phase, it remains unresolved as to how extensive a role maize and other cultigens played in the overall Sopris phase subsistence strategy. This matter will be discussed more extensively in the section detailing Sopris phase research. At this point it is important to emphasize that maize has a consistent but limited presence in both Sopris and Apishapa architectural sites.

Considerable data pertaining to Late Prehistoric faunal assemblages have accrued since publication of the previous research context (Eighmy 1984). Abundant and diverse faunal remains have been recovered from rockshelter and open sites, both architectural and nonarchitectural (Andrefsky 1990; Dwelis et al. 1996; Gunnerson 1989; Hand and Jepson 1996; Hoyt 1979; Kalasz et al. 1993; Rhodes 1984; Tucker 1991; Wood and Bair 1980; Zier and Kalasz 1985; Zier et al. 1988; Zier 1989). To date, little or no evidence suggests that game preferences changed dramatically in the shift from Archaic to Late Prehistoric stage (Butler 1992); leporids and large artiodactyls such as bison and deer tend to be predominant components in context-area faunal assemblages. Larger artiodactyls, e.g., bison, tend to be better represented at Late Prehistoric stage sites than those of the Archaic, but most of what is currently known about Archaic occupation, including faunal assemblages, is based on rockshelter studies. In comparison, fauna exploited by Late Prehistoric populations is known from a variety of site types. Investigators have identified a trend at Fort Carson for rockshelters of any age to be associated with higher ratios of small mammal remains, particularly leporids; by contrast, bone assemblages from open sites, both architectural and nonarchitectural, are comprised primarily of artiodactyls (Kalasz et al. 1993:309). This trend holds true with the faunal assemblages recovered from Wolf Spider Shelter, Upper Plum Canyon Rock shelter I, Medina Rock shelter, Pyeatt Rock shelter, Umbart Cave, and Torres Cave; leporids, particularly cottontails, are predominant at these sites (Campbell 1969a; Hand and Jepson 1996; Hoyt 1979; Rhodes 1984). The trend is not apparent in the less substantial faunal collections from Gimme Shelter, Moonshine Shelter, Davis Rockshelter and the open

architectural Forgotten site (Andrefsky et al. 1990; Dwelis et al. 1996; Loendorf et al. 1996; Tucker 1991; Wood and Bair 1980:Table XXX).

Bison remains are particularly impressive only among the architectural Apishapa phase sites of the Diversification period. Bison dominates the faunal assemblages of large Apishapa phase settlements such as Snake Blakeslee, Cramer, and Avery Ranch (Gunnerson 1989; Zier et al. 1988). Ocean Vista, an Apishapa phase architectural site situated along Turkey Creek in proximity to the Avery Ranch site, also yielded principally bison (Kalasz et al. 1993:172-212). Of note was a dense concentration of bison bone in and around a shallow pit dug into friable, decomposing bedrock.

Late Prehistoric subsistence data from the high-altitude portion of the context area are extremely sparse, and are largely restricted to faunal assemblages from the Campion Hotel site and 5LK6 on Lower Twin Lake. An emphasis on hunting and activities related to hunting (butchering, lithic tool manufacture) is suggested by these assemblages. Bone is highly fragmented as a result of thorough processing and much is unidentifiable. However, deer is predominant with jack rabbit present as well; limited evidence of fish and snake was also found (Buckles 1979:67-69, 99-103). Game drive systems on Monarch Pass clearly indicate large game procurement during the Late Prehistoric stage (Hutchinson 1990) although it is unknown which species were sought.

Architecture

As touched upon previously, the shift from Archaic to Late Prehistoric is often described partially in terms of greatly increased numbers of architectural sites. Although it is certainly not established to what extent geomorphic factors affect site visibility and preservation, with few exceptions (e.g. Rood 1990; Shields 1980), architecture in the context area is believed to be associated with the Late Prehistoric stage (Kalasz 1990:Table XII-1; Loendorf et al. 1996:Table 7.4). Within the Late Prehistoric stage, examples of Diversification period architecture far outnumber those of either the preceding Developmental period or the subsequent Protohistoric period.

Context-area architecture of any period generally consists of low stone walls. Developmental period architecture ranges from the simple, low stone wall enclosing the rockshelter at Metate Cave to the more complex, open setting structures of the Belwood and Forgotten sites (Campbell 1969a; Hunt 1975; Loendorf et al. 1996). Comparable architecture from roughly the same period is found to the north in the adjacent South Platte context area and to the south in northeastern New Mexico (Biella and Dorshow 1997a; Kalasz and Shields 1997). The Belwood and Forgotten site houses occur later in time than the Metate Cave structure and are characterized by shallow, circular or oval basins circumscribed by contiguous rock wall foundations. These are single-room domiciles with a superstructure supported by the rock foundation and wooden posts. A number of interior hearths and pits are present. Diversification period architecture is characterized by the continuation of contiguous rock wall foundations, but they form larger, aggregated room settlements as well as isolated, single-room structures. True directional change is recognized in Diversification period architecture through the prominent distinctions between Sopris and Apishapa structures (Gunnerson 1989; Kalasz 1990; Mitchell 1997; Nowak and Kantner 1990; Wood and Bair 1980; Zier et al. 1988). Both continue the tradition of contiguous rock walls and wooden posts. Vertical slabs are often associated with Apishapa phase houses although horizontally positioned rock is also common. Horizontally coursed masonry appears to be more prevalent in Sopris phase architecture although, as with Apishapa phase examples, there is considerable variability in wall construction, including occasional use of vertical slabs. However, while the Apishapa structures exhibit walls of a generally circular or curving design and a lack of formalized internal features, Sopris construction

displays a characteristic rectilinear foundation and patterned internal feature configurations. Southwestern architectural influences have been vaguely attributed to the Developmental period Belwood site, but in fact are much more pronounced in the Sopris phase. Apishapa phase architecture, on the other hand, has been described as a diluted form of the Plains Village pattern. The purported interregional relationships for the Sopris and Apishapa phases are further supported by associated ceramic assemblages.

More problematic is the presence of spaced stone or boulder walls in the Arkansas River Basin context area. Spaced stone circles resembling classic plains tipi rings are known in the context area and are generally believed to have been built by Athapaskans who arrived after the close of the Diversification period. This premise is supported by a number of tipi ring sites investigated on Carrizo Ranches property, the Apishapa Highlands, and in the Trinidad Lake area (Hand et al. 1977; Kingsbury and Nowak 1980; Kingsbury and Gabel 1980; Lutz and Hunt 1979). However, an earlier presence for this type of architecture certainly cannot be discounted given the data available at present. Furthermore, structures identified as "tipi rings" in the Trinidad area are more likely contiguous rock wall stone enclosures of the Developmental or Diversification period. Also of interest are enigmatic rectilinear foundations excavated both on the Bucci Ranch near the upper Huerfano River and along the upper Purgatoire River (Gleichman 1983; Indeck and Legard 1984; Zier et al. 1996b). Alluvial cobbles/boulders used in the construction of these walls were much more widely spaced than in the contiguous rock walls of the Sopris and Apishapa phases, but like the former they enclose a roughly rectilinear area (Indeck and Legard 1984:Figures 14, 17; Zier et al. 1996b:Figures 15-18). Excavation of the Bucci Ranch example, Structure 1 at 5HF1079, was very limited in scope, but nevertheless melted adobe was found in association (Zier et al. 1996b). Little or no cultural material and no internal features were recovered from similar structures along the upper Purgatoire River at 5LA2190, 5LA2191, and 5LA2193 (Indeck and Legard 1984). The cultural affiliation of these structures cannot be confirmed at present. Radiocarbon age assessments spanning the Diversification period were obtained from the Bucci Ranch structure, as were cord-marked ceramics and small, side-notched points believed representative of Diversification period occupation. There are no absolute dates from the Purgatoire structures, nor were diagnostic artifacts found in direct association.

DEVELOPMENTAL PERIOD

Introduction

The Developmental period of the Late Prehistoric stage in the Arkansas River Basin dates from A.D. 100 to 1050 and therefore largely corresponds with the Early Ceramic period as defined in the previous research context (Eighmy 1984). Although Eighmy's stage/period taxonomy was accepted by a number of regional archaeologists, the long-standing "Woodland" or "Plains Woodland" terminology continues to be employed (Biella and Dorshow 1997a; Butler 1988; Gunnerson 1987; Kalasz et al. 1993; Lintz and Anderson 1989; Mitchell 1997; Zier and Kalasz 1985; Zier et al. 1988). The terms "Plains Woodland" and "Woodland" should be discarded because they promote confusion about the relationship between local developmental sequences and those east of the Arkansas River Basin. The expression "Developmental" is preferred over "Early Ceramic" because it attempts to synthesize a number of pivotal events and processes which occurred during this time and does not focus on a single technological aspect. It is acknowledged that the A.D. 100 date used to introduce this period is skewed toward the earliest possible occurrences of technologies and events that define this taxon. Co-occurrences of the various attributes that characterize the Developmental period probably did not become commonplace until a few hundred years afterward but, until this prospect can be confirmed, the authors choose to err in favor of the earliest dates for arrow points.

In Colorado a number of questionable localized phases or foci such as Graneros, Parker, Hogback, and Franktown were defined for this time period, but similarities among them seem to far outweigh the differences (see Chapter 4, this volume). Butler (1986, 1988) attempts to clarify these taxonomic ambiguities by defining the Colorado Plains Woodland Regional Variant, comprised of the South Platte and Arkansas phases. However, this taxonomy was admittedly biased toward northeastern Colorado sites and, as the name implies, does not address affinities with Park Plateau and adjacent northeastern New Mexico components. In addition, variability among the Arkansas and South Platte manifestations does not appear adequate to justify the establishment of discrete phases.

Recent studies have indicated that a thorough description of Developmental period occupation necessitates the inclusion of Park Plateau components, both in southeastern Colorado and northeastern New Mexico. Archaeological survey and excavation projects have been concentrated in three districts, all of which are located in the central and southern portions of the plateau. In the Trinidad district, which is located along the Purgatoire River west of Trinidad, archaeological research has focused on Trinidad Lake (Baker 1964, 1967; Bair 1975; Dick 1954, 1963; Eighmy and Wood 1984; Ireland 1970, 1971, 1973a, 1973b, 1974a, 1974b; Ireland and Wood 1973; Karhu 1995; McCabe 1973; Mitchell 1997; Wood 1981, 1986; Wood and Bair 1980) and on a variety of energy projects (McKibbin et al. 1997; Tucker 1983; Rood and Church 1989). Several smaller studies have been completed for highway projects (Baker 1965; Blair 1980; Gleichman 1983; Indeck and Legard 1984). One project has examined the highlands north of the Purgatoire River valley (Lutz and Hunt 1979).

Archaeological projects have been conducted in two districts in New Mexico. In the Vermejo district, located along the upper Vermejo River and its major tributaries, large-scale compliance projects have been completed for a series of contiguous coal mines (Biella and Dorshow 1997a; Campbell 1984; Glassow 1984; Kershner 1984). Research in the Cimarron district, located immediately north and west of Cimarron, New Mexico along the lower Cimarron, Ponil, and Vermejo rivers, has been conducted by archaeologists associated with the Philmont Scout Ranch operated by the Boy Scouts of America (Bogan 1941; Fredine 1997; Glassow 1980, 1984; Kirkpatrick 1976; Kirkpatrick and Ford 1977; Lutes 1959a, 1959b; Skinner 1964; Thoms 1976). One small compliance project has also been completed in the Cimarron district (Wiseman 1988).

Few formal cultural taxa have been comprehensively defined for the Developmental period on the Park Plateau. However, a variety of cultural-temporal systems has been used to organize information about the early post-Archaic record in the Cimarron, Vermejo, and Trinidad districts. That the terms "Basketmaker" (Lang 1978), "Neo-Indian" (Thoms 1976), "Archaic" (Wendorf 1960), and "Woodland" (Campbell 1969a) have all been applied to the archaeological record of the first millennium A.D. in northeastern New Mexico and southeastern Colorado reflects a continuing taxonomic ambivalence among archaeologists working in the area, and a number of important culture-historical problems have yet to be fully resolved.

Fortunately, only two cultural-temporal systems have been widely applied in practice. The first such system is derived from the Pecos Classification. During the 1950s, several investigators called attention to architectural and ceramic similarities between sites located along the upper Canadian River and its major tributaries and sites located in the northern Rio Grande valley (Gunnerson 1959; Lutes 1959a, 1959b; Wendorf 1960). Although these investigators considered the Park Plateau manifestations "marginal," they nevertheless saw them as Puebloan at least in the most general sense. Glassow (1980) codified this understanding by developing a period system for the Cimarron district which mirrors the temporal and developmental outlines of the Pecos system. For the Developmental period, Glassow (1980: 70) defines three "phases," a

term he considers to be synonymous with "period" (Table 7-2). Glassow (1980, 1984) applied this system to survey and limited excavation data from the Cimarron, Vermejo, and Ponil river drainages west of Cimarron. This system has also been used by Wiseman (1988) and by Campbell (1984).

Table 7-2. Park Plateau Cultural-Temporal System of Glassow (1980).

Phase Name	Dates	Criteria/Characteristics
Escritores	A.D. 900-1100	Kiatuthlanna or Red Mesa Black-on-white
Pedregoso	A.D. 700-900	Radiocarbon dates
Vermejo	A.D. 400-700	Circular masonry architecture
Archaic	pre-A.D. 400	Stemmed dart points

More recent projects conducted in the Vermejo district (Biella and Dorshow 1997a) and Trinidad district (Mitchell 1997) demonstrate that the archaeological record of the Park Plateau does not make a good fit with the Pecos Classification. Particularly for the Vermejo district, researchers have adopted the plains-based terminology devised originally by Campbell (1969a) for the Chaquaqua Plateau of southeastern Colorado (see Chapter 4 of this volume for a more detailed discussion of Campbell's chronology). Accordingly, Dorshow (1997a) defines three Woodland periods spanning the eight centuries between A.D. 200 and 1000 (Table 7-3). This cultural-temporal system has been applied to extensive survey and excavation data from the upper tributaries of the Vermejo River.

Table 7-3. Park Plateau Cultural-Temporal System of Dorshow (1997a).

Phase Name	Dates	Criteria/Characteristics
Terminal Plains Woodland	A.D. 750-1000	Circular masonry architecture; radiocarbon dates
Initial Plains Woodland	A.D. 450-750	Storage cists; semi-subterranean pit structures; corner-notched arrow points; radiocarbon dates
Transitional Archaic/ Plains Woodland	A.D. 200-450	
Archaic	pre-A.D. 200	Dart points; radiocarbon dates

In the Trinidad district relatively few sites that date to the Developmental period have been documented. Here, too, researchers have revealed a certain ambivalence about cultural affiliation. For example, the Running Pit House site excavated in the late 1950s was first attributed to a "Basketmaker" occupation (Ireland 1974a; Dick 1974), and later to the Early Ceramic period (Eighmy 1984). Although a formal phase system has not been proposed for the first millennium in the Trinidad district, researchers have attributed sites that appear to date to that period variously to an undifferentiated "Formative Stage" (Tucker 1983), the "Woodland" period (Baker 1964), or the "Early Ceramic" period (Eighmy 1984; McKibbin et al. 1997).

Despite this terminological proliferation in Colorado and New Mexico, the Developmental period as defined here describes a widespread manifestation characterized by significant homogeneity in settlement, economy, and material culture. The evidence presented below indicates that a modified version of the long-lived, Archaic hunter-gatherer adaptive strategy continued along the eastern flanks of the Rocky Mountains from northeastern Colorado to northeastern New Mexico. Most researchers agree that many early post-Archaic sites in this region can be distinguished from Late Archaic sites on the basis of both architectural and artifactual criteria. The Developmental period is characterized by the widespread appearance of residential architecture, by the first appearance of the bow-and-arrow and ceramic containers, and by the appearance of small-scale maize horticulture. However, spatial and temporal variability is evident within the context of these trends, and near the close of the Developmental period the archaeological record of the Park Plateau begins to diverge from the contemporaneous record on the plains. Current data sets associated with this far-flung manifestation hint at the potential for generating discrete regional phases, but such a step awaits additional excavation and synthesis. Currently it is most important to establish the geographical bounds of Developmental period occupation and common attributes that facilitate future contrast and comparison.

Chronology

Developmental period dates that signal the shift from the Archaic stage to the Late Prehistoric stage in the context area are presented in a previous section of this chapter. That section focuses on the larger body of dated Developmental period components from the Arkansas River Basin and northeastern New Mexico. Excavated occupations with associated absolute dates are emphasized to assess more accurately the Developmental period age range. Also emphasized are those components exhibiting the proposed hallmarks of the Developmental period such as small, corner-notched projectile points, ceramics, and architecture. Important Developmental period sites in the context area are shown in Figure 7-1.

Prominent Developmental period radiocarbon ages from the Arkansas River Basin other than the Park Plateau or high altitude area are presented in Table 7-4. Dates listed to signal the advent of the Late Prehistoric stage (Table 7-1) are repeated in Table 7-4 to facilitate an overall view of Developmental period temporal data restricted to the plains regions of the context area. All raw B.P. dates were submitted to a common calibration program (Stuiver and Reimer 1993) and the results provided in the table. The few high altitude sites with radiocarbon ages falling within the Developmental period temporal range are summarized in the general background section for the Late Prehistoric stage; the raw ages are presented in Appendix A (this volume). Park Plateau dates, primarily those from northeastern New Mexico sites falling outside the boundaries defined for the context area, are believed to be important for a comprehensive study of Developmental period occupation. Therefore, prominent, dated occupations from the Park Plateau region are discussed after presentation of the chronometric data applicable solely to the plains portion of the context area.

Developmental period occupations from the northern margin of the context area were reported at Davis Rockshelter, 5EP2, and 5EP935 along Black Squirrel Creek (Dwelis et al. 1996; McDonald 1992; Wynn et al. 1993). Small, corner-notched points and cord-marked ceramics were recovered from the sites although the stratigraphic associations between artifacts and dates are problematic. As one moves south, a series of dated Developmental period rockshelters was excavated at Fort Carson (Kalasz et al. 1993; Zier and Kalasz 1985; Zier 1989; Zier et al. 1996a). These sites include Recon John Shelter, 5PE909, Gooseberry Shelter, Sullivan Shelter, and Two Deer Shelter. All of the Developmental period components are associated with small, corner-notched projectile points. In addition, cord-marked ceramics were recovered from the

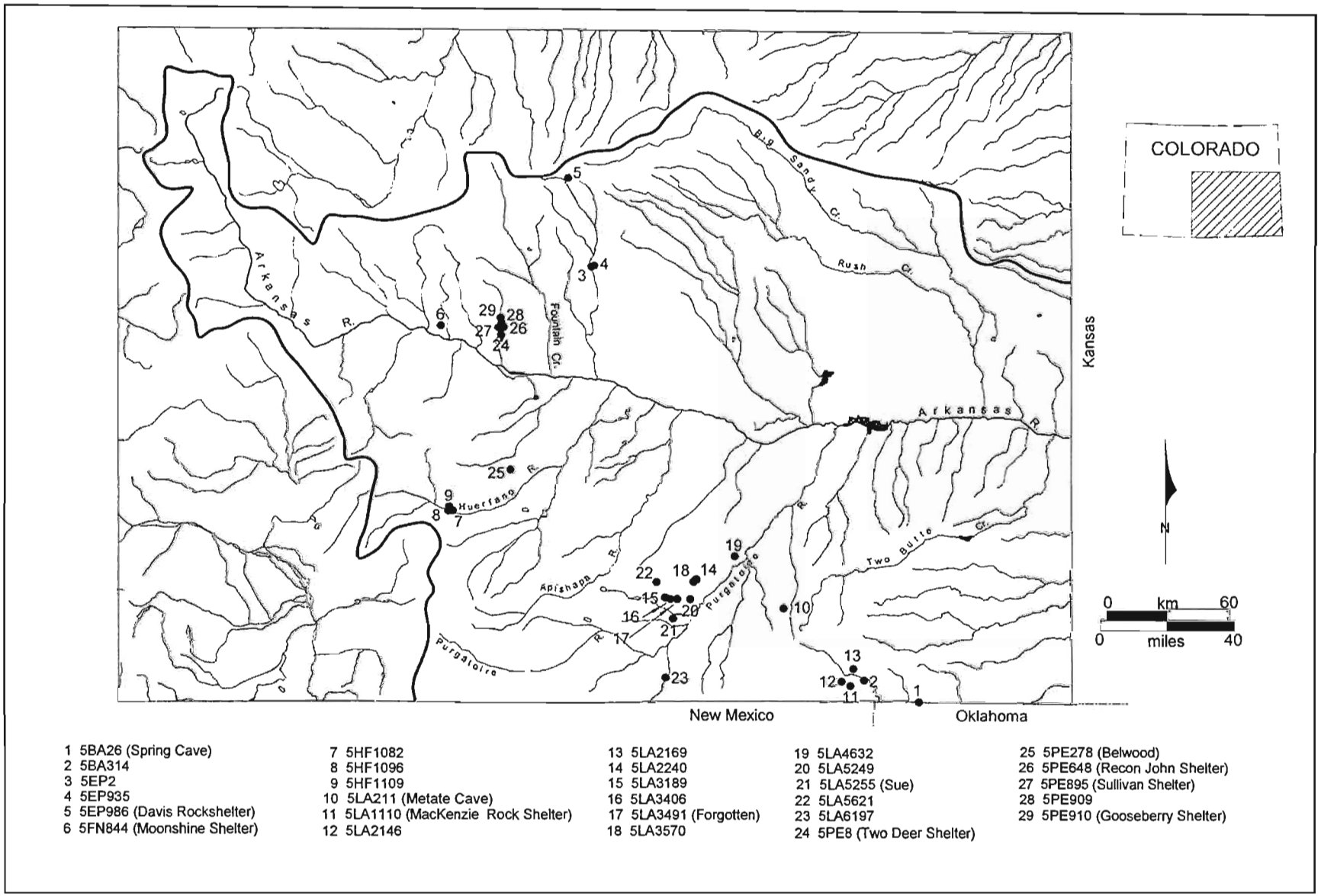

Figure 7-1. Map of Arkansas River context area showing locations of selected Developmental period sites.

Developmental period deposits at Recon John and Gooseberry shelters. Farther south near Canon City, another significant, dated Developmental period rockshelter occupation was reported in the multicomponent Moonshine Shelter (Tucker 1991). Small, corner-notched points were recovered from these deposits but ceramics were not.

Numerous important Developmental period sites are located south of the Arkansas River. The Belwood site along Graneros Creek in the vicinity of Colorado City has long served as the "type site" for the Graneros focus (Eighmy 1984; Hunt 1975; Withers 1954). This site produced small, corner-notched points, cord-marked ceramics, and substantial open-setting architecture. Three open nonarchitectural sites with Developmental period dates (5HF1082, 5HF1096, and 5HF1109) were excavated on the Bucci Ranch near Gardner (Zier et al. 1996b). Of these three sites only 5HF1109 exhibited an artifact diagnostic of the Developmental period, specifically a single, small corner-notched point. Recent excavations on the PCMS provided a wealth of information about this segment of the Late Prehistoric stage (Loendorf et al. 1996). Most notable are the open architectural Forgotten site and the series of small rockshelters with enclosure walls at 5LA3189. The only ceramics from either site are the polished specimens believed associated with a Protohistoric period component at 5LA3189. However, small, corner-notched projectile points were recovered from both sites. Several PCMS sites with Developmental period radiocarbon dates are lacking the "hallmark" artifacts (ceramics, corner-notched projectile points) or, alternatively, do not exhibit clear-cut stratigraphic associations between the radiocarbon samples and such artifacts (Andrefsky et al. 1990; Charles et al. 1996; Lintz and Anderson 1989). These sites include 5LA2240, 5LA3406, 5LA3570, 5LA4632, 5LA5249, 5LA5621, and the Sue site. Of these, multicomponent site 5LA3570 is particularly notable because of the presence of a possible game drive rock alignment and a stone enclosure (Charles et al. 1996).

Table 7-4. Important Developmental Period Radiocarbon Dates from Plains Sites.

Site Name/ Number	Artifact Association	Raw Radio-carbon Age (B.P.)	Calibrated Age		Two Sigma Calibrated Age Ranges from Probability Distributions (Method A)	
			A.D./B. C.	B.P.	A.D./B.C.	B.P.
Recon John Shelter	Point	1910 ± 90	A.D. 88, 98, 115	1862, 1852, 1835	91 B.C.-A.D. 336	2041-1614
5EP935	Point/ ceramics?	1890 ± 60	A.D. 125	1825	A.D 4-315	1946-1635
Recon John Shelter	None	1870 ± 50	A.D. 135	1815	A.D. 58-316	1892-1634
5HF1109	Point	1820 ± 70	A.D. 230	1720	A.D. 65-399	1885-1551
Davis Rockshelter	Point/ ceramics?	1810 ± 60	A.D. 235	1715	A.D. 79-391	1871-1559
5LA4632	None	1810 ± 60	A.D. 235	1715	A.D. 79-391	1871-1559
Wolf Spider Shelter	Point	1800 ± 120	A.D. 239	1711	36 B.C.-A.D. 538	1986-1412
5BA314	Point?	1735 ± 65	A.D. 266, 278, 331	1684, 1672, 1619	A.D. 137-437	1813-1513

Site Name/ Number	Artifact Association	Raw Radio-carbon Age (B.P.)	Calibrated Age		Two Sigma Calibrated Age Ranges from Probability Distributions (Method A)	
			A.D./B. C.	B.P.	A.D./B.C.	B.P.
Wolf Spider Shelter	Point	1690 ± 80	A.D. 389	1561	A.D. 145-548	1805-1402
5PE909	Point	1690 ± 60	A.D. 389	1561	A.D. 233-535	1717-1415
Metate Cave	Point/ ceramics	1680 ± 95	A.D. 397	1553	A.D. 134-601	1816-1349
5BA26	Point	1645 ± 120	A.D. 417	1533	A.D. 126-653	1824-1297
Two Deer	Point	1580 ± 70	A.D. 459, 478, 510, 531	1491, . 1472, 1440, 1419	A.D. 339-636	1611-1314
5HF1082	None	1570 ± 80	A.D. 535	1415	A.D. 267-652	1683-1298
Wolf Spider Shelter	Point	1570 ± 90	A.D. 535	1415	A.D. 260-657	1690-1293
5HF1096	None	1530 ± 50	A.D. 548	1402	A.D. 422-642	1528-1308
5LA3406	None	1530 ± 60	A.D. 548	1402	A.D. 414-652	1536-1298
5LA3570	Point?	1510 ± 50	A.D. 563, 586, 591	1387, 1364, 1359	A.D. 430-652	1520-1298
Belwood	Ceramics	1500 ± 55	A.D. 596	1354	A.D. 430-658	1520-1292
Recon John Shelter	Ceramics	1500 ± 70	A.D. 596	1354	A.D. 418-666	1532-1284
5EP2	Point/ ceramics?	1490 ± 60	A.D. 600	1350	A.D. 430-663	1520-1287
5LA2240	None	1490 ± 60	A.D. 600	1350	A.D. 430-663	1520-1287
Moonshine Shelter	Point	1470 ± 70	A.D. 610	1340	A.D. 430-677	1520-1273
5BA314	Point?	1460 ± 80	A.D. 619	1331	A.D. 426-694	1524-1256
Davis Rockshelter	Point/ ceramics?	1420 ± 50	A.D. 646	1304	A.D. 550-682	1400-1268

Site Name/ Number	Artifact Association	Raw Radio-carbon Age (B.P.)	Calibrated Age		Two Sigma Calibrated Age Ranges from Probability Distributions (Method A)	
			A.D./B. C.	B.P.	A.D./B.C.	B.P.
5LA2146	Point	1410 ± 70	A.D. 651	1299	A.D. 540-773	1410-1177
Recon John Shelter	Point/ ceramics	1400 ± 90	A.D. 654	1296	A.D. 452-790	1498-1160
Gooseberry Shelter	Point/ ceramics	1400 ± 100	A.D. 654	1296	A.D. 437-873	1513-1077
5LA2240	None	1380 ± 60	A.D. 660	1290	A.D. 570-776	1380-1174
5EP2	Point/ ceramics?	1350 ± 60	A.D. 668	1282	A.D. 608-786	1342-1164
5LA3570	Point?	1350 ± 60	A.D. 668	1282	A.D. 608-786	1342-1164
5LA5621	None	1330 ± 70	A.D. 676	1274	A.D. 608-881	1342-1069
5LA2146	Point	1320 ± 70	A.D. 680	1270	A.D. 616-884	1334-1066
Two Deer Shelter	Point	1300 ± 80	A.D. 690	1260	A.D. 616-943	1334-1007
Forgotten	Point	1300 ± 120	A.D. 690	1260	A.D. 544-998	1406-952
Wolf Spider Shelter	Point	1280 ± 90	A.D. 719, 739, 766	1231, 1211, 1184	A.D. 616-973	1334-977
Forgotten	Point	1240 ± 100	A.D. 782	1168	A.D. 634-1011	1316-939
5LA2240	None	1220 ± 60	A.D. 789	1161	A.D. 670-974	1280-976
5LA2169	None	1220 ± 65	A.D. 789	1161	A.D. 667-979	1283-971
5LA2169	None	1220 ± 50	A.D. 789	1161	A.D. 679-962	1271-988
5LA3189	Point	1180 ± 80	A.D. 883	1067	A.D. 670-1017	1280-933
5LA5249	Point?	1170 ± 120	A.D. 886	1064	A.D. 651-1156	1299-794
Recon John Shelter	Point/ ceramics	1150 ± 60	A.D. 891	1059	A.D. 727-1014	1223-936

Site Name/ Number	Artifact Association	Raw Radio-carbon Age (B.P.)	Calibrated Age		Two Sigma Calibrated Age Ranges from Probability Distributions (Method A)	
			A.D./B. C.	B.P.	A.D./B.C.	B.P.
Two Deer Shelter	Point	1130 ± 70	A.D. 896, 914, 955	1054, 1036, 995	A.D. 727-1026	1223-924
5LA2169	None	1130 ± 65	A.D. 896, 914, 955	1054, 1036, 995	A.D. 775-1023	1175-927
Forgotten	Point	1120 ± 80	A.D. 898, 906, 961	1052, 1044, 989	A.D. 718-1037	1232-913
Forgotten	Point	1100 ± 100	A.D. 973	977	A.D. 689-1165	1261-785
5LA2146	Point	1080 ± 40	A.D. 984	966	A.D. 887-1023	1063-927
5LA2240	None	1080 ± 60	A.D. 984	966	A.D. 870-1037	1080-913
Davis Rockshelter	Point/ ceramics	1070 ± 60	A.D. 989	961	A.D. 880-1150	1070-800
5HF1082	None	1040 ± 50	A.D. 1011	939	A.D. 893-1153	1057-797
MacKenzie Rock Shelter	Point?	1010 ± 60	A.D. 1020	930	A.D. 895-1168	1055-782
Sullivan Shelter	Point	990 ± 50	A.D. 1025	925	A.D. 977-1168	973-782
Sue	None	980 ± 50	A.D. 1028	922	A.D. 983-1180	967-770

South of the PCMS, substantial and significant Developmental period remains were reported at Wolf Spider Shelter (5LA6197) along Trinchera Creek. A variety of small, corner-notched points was associated with this component but no ceramics were recovered (Hand and Jepson 1996). Metate Cave, a site recorded by Campbell (1969a) on the Chaquaqua Plateau, produced one of the earlier Developmental period radiocarbon dates associated with small, corner-notched points, ceramics, and an architectural feature. A number of sites on Carrizo Ranches property attest to Developmental period occupation (Nowak and Kantner 1990, 1991). Of particular interest are two rockshelters, 5BA26 and 5LA2146, with radiocarbon-dated Developmental period deposits in association with small, corner-notched points but no ceramics. Developmental period occupations are indicated by radiocarbon dates recovered from two additional rockshelters, 5BA314 and MacKenzie Rock shelter, and open site 5LA2169. The latter site produced a series of radiocarbon dates from a large (ca. 7 m in diameter) hearth area with no associated ceramics or small, corner-notched points. Indeed, this site is a well-known Apishapa phase stone enclosure occupation (Nowak and Kantner 1990:32-34). The hearth is believed to

represent an occupation preceding that of the stone enclosures. The two radiocarbon dates recovered from 5BA314 are believed to be associated with disturbed contexts and the date from MacKenzie Rock shelter is from deposits characterized by a mixture of corner- and side-notched points but no ceramics.

By far the most robust body of chronological data from Park Plateau Developmental period sites has been generated for the Vermejo district. Dorshow (1997a) reports 27 radiocarbon dates and one archaeomagnetic date from Developmental period excavation contexts. Obsidian hydration analyses were also undertaken but yielded poor results. These chronometric data indicate that semisubterranean pit structures or house basins were in use at least by about A.D. 160 (Dorshow 1997a: 936). Such structures, many of which are difficult to locate during pedestrian surveys, may have appeared during the Late Archaic period, or perhaps earlier (Wetherbee Dorshow, personal communication to Mark Mitchell, 1998). Bell-shaped storage cists were also in use during this period. These architectural features persist until about the seventh century, when above-ground circular stone masonry structures, reminiscent of both Glassow's Vermejo phase structures and the circular stone enclosures thought to be typical of Developmental period sites in southeastern Colorado (e.g., Hunt 1975), first appear. The mean date for these structures in the Vermejo district is cal A.D. 787 (Dorshow 1997a). Kershner (1984) also reports mid-seventh century dates (uncalibrated) for circular, above-ground masonry structures. This type of residential architecture remained in use until the tenth or eleventh century.

Relative dating techniques have also been applied to Developmental period sites in the Vermejo district. Using a projectile point typology developed by Anderson (1989a) for the PCMS, Dorshow (1997b) identifies two large (dart) point types and seven small point types associated with Developmental period sites. The assemblage is dominated by small to medium-sized corner-notched or stemmed forms, indicating that the use of the bow-and-arrow was widespread. Dorshow's comparison of published dates for these styles with the radiocarbon database of the Vermejo district suggests that many of these projectile points appeared on the eastern flank of the southern Sangre de Cristos earlier than elsewhere in the region. However, these apparently early dates may be attributed in part to the "old wood" problem. The potential magnitude of this problem is illustrated by the results of preliminary tree-ring analyses in the Trinidad district. Cores from live trees indicate that many pinyon pines on the southern end of the plateau may be more than 300 years old (Ronald Towner, personal communication to Mark Mitchell, 1997). Radiocarbon sampling of Diversification period architectural timbers also illustrates the possible effects of the old wood problem (see Diversification period chronology section, this volume). This problem is exacerbated by the difficulty of distinguishing among the many Southern Plains cord-marked ceramic types, making correlations between radiocarbon age determinations and temporally diagnostic artifact classes problematic.

Relatively few absolute dates are available for the Cimarron or Trinidad districts. Glassow (1980:Appendix II) reports four radiocarbon dates, two from Pedregoso phase contexts and two from Vermejo phase structures. The Pedregoso phase dates derive from bell-shaped roasting or storage features and are associated with a few thick, oxidized ceramics. Both dates fall in the middle of the A.D. eighth century, without calibration (1200 ± 80 B.P., or A.D. 750, and 1195 ± 80 B.P., or A.D. 755). One Vermejo phase sample comes from a posthole in the floor of a typically Vermejo phase stone enclosure, and dates to A.D. 510 (1460 ± 50 B.P.). The second sample was excavated by Galen Baker in 1962 from the interior of a Vermejo phase structure. The resultant date, A.D. 1095 (855 ± 50 B.P.), is rejected by Glassow and attributed to the postoccupational intrusion of a tree root. Wiseman (1988) reports two radiocarbon dates from Developmental period sites along the lower Cimarron River. The first, from a Vermejo phase midden, was derived from a scattered carbon sample and may have been associated with maize remains. This sample dates to A.D. 410 (1540 ± 90 B.P.). The second comes from a hearth

associated with an arrow point and maize remains, and dates to A.D. 1060 (890 ± 100 B.P.). Although Wiseman assigns this feature to occupation in the late Pedregoso phase or early Escritores phase, the feature is more likely attributable to the early Diversification period.

Gleichman (1983) reports one Developmental period radiocarbon date for the Trinidad district. A charcoal lens exposed in a cutbank yielded a date of A.D. 860 at 5LA2202 (1090 ± 55 B.P.). This site also produced ground stone tools, chipped stone tools (including a possibly corner-notched projectile point fragment) and debitage, and burned bone. The site also exhibited two nonarchitectural stone features, each consisting of cobble concentrations. Mitchell (1997) reports three archaeomagnetic dates which may derive from Developmental period features. All of these samples were collected in 1975 for analysis by Robert DuBois at the University of Oklahoma. The samples were recalibrated by Jeffrey L. Eighmy at CSU using the most recent Southwest Archaeomagnetic Master Curve (Table 7-5).

Table 7-5. Developmental Period Archaeomagnetic Dates.

Archaeomagnetic Date Ranges	Archaeological Context
A.D. 925-1020; A.D. 1275-1475; A.D. 1500-1750	5LA1211, Feature 15. Storage pit not directly associated with an architectural feature
A.D. 925-975; A.D. 1575-1635	5LA1211, Feature 53. Hearth located below the floor of a Sopris phase structure
A.D. 740-790; A.D. 830-875	5LA1416, Feature 90. Hearth located below the floor of a Sopris phase structure and associated with a possible pit house floor

The samples from Feature 53 at 5LA1211 and Feature 90 at 5LA1416 produced the dates with the highest confidence; the age determination for Feature 15 at 5LA1211 is less certain. Several Developmental period radiocarbon dates are also available for Trinidad Lake sites (Table 7-6).

Table 7-6. Developmental Period Radiocarbon Dates from Trinidad Lake Sites.

Radiocarbon Date*	Archaeological Context
A.D. 895 (A.D. 775-1015 [1140 ± 60 B.P.])	5LA1416, Structure 6. Floor fill from semisubterranean pit house; maize sample
A.D. 790 (A.D. 680-905 and A.D. 920-950 [1230 ± 50 B.P.])	5LA1424, Feature B. Floor fill from semisubterranean pithouse which may be from the terminal Developmental period or early Diversification period
A.D. 785 (A.D. 645-995 [1240 ± 90 B.P.])	5LA1416, Feature 20. Storage cist under a Sopris phase jacal structure; maize sample
A.D. 705 (A.D. 655-875 [1290 ± 50 B.P.])	5LA1416, Feature 20. Storage cist under a Sopris phase jacal structure.

* Calibrated curve intercept. Two-sigma calibrated date and conventional radiocarbon age are in parentheses.

Unfortunately, several other terminal Developmental period dates are clearly associated with structures which were in use during the Diversification period. This apparent temporal overlap is likely a consequence of the old wood problem. Carbonate or coal contamination may also be a problem; Wood and Bair (1980:225) rejected a suite of 10 radiocarbon dates as a result of probable sample contamination.

Population Dynamics

The paucity of excavated Developmental period sites both on the Park Plateau and within the larger Arkansas River Basin precludes a detailed discussion of local population dynamics. However, a number of general conclusions may be drawn about population movements and demographics. To date there is no evidence that new populations arrived in eastern Colorado and northeastern New Mexico during the Developmental period. Widespread artifactual and stratigraphic data associated with, for example, rockshelters at Fort Carson as well as open-setting architectural sites in the Vermejo district of northeastern New Mexico and the foothills east of Denver suggests that, in population terms, the Developmental period was a continuation of the Late Archaic period (Andrefsky 1990; Andrefsky et al. 1990; Biella 1997:1031; Kalasz et al. 1993; Kalasz and Shields 1997; Nelson 1971; Zier 1989; Zier and Kalasz 1991). The larger number of Developmental period radiocarbon dates (and sites) may not indicate increasing population, but rather that such sites, particularly those with architecture, were more visible than Archaic stage sites (Biella 1997:1030; Lintz and Anderson 1989). On the other hand, it is equally likely that the Park Plateau, South Platte River Basin, and greater Arkansas River Basin populations participated in what appears to be regionwide demographic expansion.

For the Cimarron district in northeastern New Mexico, Glassow is equivocal on this point. Although his cultural-temporal framework implies connections to the occupation of the Rio Grande valley or San Juan River valley, and he consistently refers to the pre-A.D. 1000 occupants of the southern Park Plateau as "Puebloans," he nevertheless argues that the Vermejo phase "represents an adaptation *very similar* to that of the Early Basketmakers of the San Juan River basin" (Glassow 1980:103 [italics added]). This characterization effectively circumvents the need to explain where the Vermejo phase inhabitants of the district came from.

Glassow also identifies formal artifact attributes that suggest regional cultural continuity. In particular, he notes the large number of tubular bone beads recovered from sites in the Cimarron district. Beads of this type are common among contemporaneous Arkansas River Basin assemblages (Erdos 1998). Glassow's data also suggest that local populations probably increased throughout the Developmental period. Whether this was due to indigenous demographic expansion or migration is not entirely clear, although he does suggest that artifactual and architectural variability in the district might be attributable to "small population units ... continually expanding into the region" (Glassow 1980:77).

So little Developmental period excavation data are available for the Trinidad district that no substantive observations on population dynamics can be made, except to note that occupation during this time appears to be less extensive and less intensive than in the adjacent Vermejo district, the Cimarron district, or the larger Arkansas River Basin. Large, single-room stone enclosures similar to those at the Belwood and Forgotten sites, or to the Terminal Plains Woodland structures in the Vermejo district, appear to be absent from the Trinidad district (Biella and Dorshow 1997a; Hunt 1975; Loendorf et al. 1996). The possible exception is 5LA1411 which overlooks the Purgatoire River, and 5LA1482 which is located north of Raton Pass. Both of these sites are undated and may or may not represent Developmental period occupations (Baker 1965; Ireland 1974a). Based on the lack of some artifact classes (notably ceramic vessels), the Running Pithouse site has also been attributed to the Developmental period (Ireland 1974a; Eighmy 1984).

The lack of such stone enclosures does not, however, preclude the possibility of a Developmental period occupation of the Trinidad district, since the few dated Developmental architectural contexts consist of very shallow basin houses or storage pits that have little or no modern surface expression. This type of ephemeral architecture was also documented at the Belwood site, adjacent to a better-known stone enclosure (Hunt 1975).

Technology

Increased technological diversity is an important factor in distinguishing the Developmental period from the preceding Late Archaic period. Whether because of trade or innovation, this segment of prehistory witnesses the advent of the bow-and-arrow and ceramic containers. The bone and shell industries seen in Developmental period contexts obviously have their antecedents in the Archaic stage. However, these implements and ornaments are evidently more abundant in some Developmental period contexts (primarily rockshelters) and exhibit greater morphological diversity. This situation may reflect preservation and/or sampling factors.

Other than the appearance of arrow-sized points, the Developmental period lithic assemblage is remarkably unchanged from preceding Late Archaic period tools kits (Dorshow et al. 1997; Hand and Jepson 1996; Kalasz et al. 1993; Loendorf et al. 1996; Zier and Kalasz 1991; Zier 1989). The lithic artifact most diagnostic of the Developmental period is the ubiquitous, small, corner-notched arrow point typically referred to as "Scallorn." However, it is emphasized that certain Archaic styles, particularly large corner-notched varieties, are also commonly recovered from Developmental period components (e.g., Dwelis et al. 1996:Figure 6D; Hoyt 1979:Figure 6; Loendorf et al. 1996:Figure 4.35a; Tucker 1991:Figure 7K; Zier 1989:Figure 31F). Chipped stone tool manufacturing strategies are oriented toward the production of formal bifaces and a variety of flake tools. Minimally modified or expedient flake tools typically outnumber formally patterned flake tools such as end scrapers. Cores and core tools are generally representative of freehand percussion or unstandardized flake removal. Debitage analyses indicate that late-stage tool manufacture and tool refurbishment is emphasized at both base camps and limited activity sites. It is apparent that chipped stone arrived at these sites in a considerably reduced state. However, it is emphasized that these conclusions are derived from a site sample skewed toward locales where a variety of domestic tasks was completed. Currently, there is no information pertaining to more specialized lithic procurement or reduction sites of the Developmental period. A variety of local and nonlocal materials was utilized at Developmental period sites. A few are characterized by a dichotomy in the use of exotic (nonlocal) materials and local materials of lower quality (Fredine 1997:77-78; Hand and Jepson 1996; Zier 1989). The former were more often used for finely crafted formal tools, and the latter tended to be used for a wide range of less formal tools.

Ground stone assemblages exhibit the typical context area tendency toward simple flat or shallow basin slab metates and "one-hand" cobble manos (Hand and Jepson 1996). Metates are generally of sandstone and exhibit minimal modification but are sometimes shaped by flaking the edges (Zier 1989). Manos, typically of sandstone, are both unifacial and bifacial; they sometimes exhibit keeled edges (Kalasz et al. 1993; Loendorf et al. 1996). Margins are often pecked or battered, or both. In addition to the "portable" ground stone varieties, Developmental period sites often exhibit bedrock or boulder grinding surfaces (Loendorf et al. 1996).

A major technological change associated with the Developmental period is the use and manufacture of ceramic vessels. Developmental period ceramic assemblages do not approach those of the succeeding Diversification period either in relative abundance or ware diversity. In the context area, ceramics were recovered from Developmental period occupations at Metate Cave, Recon John Shelter, Gooseberry Shelter, Davis Rockshelter, Torres Cave, 5EP935, and the

Belwood site (Campbell 1969a; Dwelis et al. 1996; Hoyt 1979; Hunt 1975; Kalasz et al. 1993; McDonald 1992; Zier and Kalasz 1985; Zier 1989). With the exception of a rim sherd identified as "Dismal River" at Davis Rockshelter, the ceramics from these sites were identified as cord-marked wares with crushed-rock temper. The specimens are believed to reflect conoidal-based jars constructed with a paddle and anvil technique. Cord marks are often obliterated and sometimes exhibit superimposed shallow incisions (Zier 1989). The largest samples are associated with the Belwood site and 5EP935 (121 and >190 sherds, respectively). Several sherds from the Belwood site were noted to exhibit an orange or gray to white slip (Hunt 1975:87), but this is apparently a rare occurrence among Developmental period assemblages. A single sherd recovered from Developmental period deposits at the Magic Mountain site near Denver displayed an interior yellowish orange slip (Kalasz and Shields 1997:Figure 32).

Although few in number, Park Plateau ceramics associated with Developmental period radiocarbon dates are frequently distinct in both technological and stylistic terms from the cord-marked wares associated with Developmental period sites elsewhere in the Arkansas River Basin. For the Cimarron district, Glassow (1980:72) reports "very crude, thick, oxidized pottery" associated with a Pedregoso phase midden dated to the middle of the A.D. eighth century. Similar oxidized, sand-tempered sherds have been recovered from what appear to be terminal Developmental period structures in the Trinidad district (Mitchell 1997). Ceramics of this general description are also associated with later Sopris phase structures (see Sopris phase technology section, this volume). They are technologically distinct from the imported Taos wares characteristic of Sopris phase ceramic assemblages, suggesting continuity in a local Park Plateau ceramic tradition.

A few cord-marked sherds have also been recovered from Developmental period contexts in the Vermejo district of northeastern New Mexico (Habicht-Mauche 1997). However, the difficulty of assigning such sherds to particular types prevents more detailed comparison. Similar problems exist for the Trinidad district, where a few sites have produced cord-marked ceramics. Most of these sherds, however, appear to be associated with later Diversification period occupations. No cord-marked ceramics have been reported from the Cimarron district.

Ornaments and tools of bone and shell are fairly common among Developmental period occupations but assemblages are generally small. Gooseberry Shelter, Davis Rockshelter, and 5EP935 are somewhat notable by the complete absence of bone tools (Dwelis et al.1996; Kalasz et al. 1993; McDonald 1992). On the other hand, relatively large and diverse bone tool and ornament assemblages were recovered from Wolf Spider Shelter and Torres Cave in the southern portion of the context area (Hand and Jepson 1996; Hoyt 1979), and KS60 in northeastern New Mexico (Brown and Brown 1997). Modified bone from these sites largely falls into two general classes: bone tubes made from small mammal (mainly leporid) and to a lesser extent bird bone, and awls made from the split long bones of large mammals (mainly deer). Overall, the Developmental period bone tool industry is much less diverse than that of the Diversification period; in addition to the awl, the latter period is characterized by a number of morphologically diverse large mammal bone tools believed to have functioned as scrapers, knives, fleshers, and handles. As with later Diversification period examples, Developmental period tubular beads are typically scored and snapped bone that display considerable polish; in most instances the ends of the beads are shaped by grinding. However, Brown and Brown (1997:866) cite a number of additional ethnographic uses for bone tubes. Specifically, bone tubes may have been used as bow or wrist guards, tool handles, ceremonial objects, and/or sucking implements used in healing ceremonies or to extract snake venom. Such a wide range of uses for bone tubes may be reflected by the considerable variability in size exhibited by the specimens from Wolf Spider Shelter (Hand and Jepson 1996:Figure 22).

Shell is known from Developmental period occupations at Wolf Spider Shelter, 5LA2146, the Belwood site, Moonshine Shelter, Metate Cave, Torres Cave, the Forgotten site, Recon John Shelter, and the Beacon Hill Burial (5PE9) (Black 1991; Campbell 1969a; Hand and Jepson 1996; Hoyt 1979; Hunt 1975; Loendorf et al. 1996; Nowak and Kantner 1991; Tucker 1991; Zier 1989). Most of the shell is probably representative of indigenous *Unionidae* freshwater mussels procured as subsistence items (Nowak and Kantner 1991:157). However, ground and drilled shell pendants were reported from Wolf Spider Shelter and the Forgotten site (Hand and Jepson 1996:Figure 24; Loendorf et al. 1996:Figure 4.41). A particularly impressive shell necklace with a turquoise pendant was associated with the possibly Developmental period Beacon Hill Burial near Pueblo (Black 1991:Figure 9). Incorporated into the necklace were 92 "spiral-lopped" *Olivella* shell beads that were probably brought in from the Gulf of California region. Other, less spectacular examples of modified shell were reported from Recon John Shelter and Torres Cave (Hoyt 1979; Zier 1989).

Settlement and Subsistence Strategies

Site Type and Locational Variability

Information sets that facilitate examination of Developmental period settlement are derived from both survey and excavation. Extensive surveys of Fort Carson, PCMS, Picket Wire Canyonlands, and Chaquaqua Plateau attest to the pervasiveness of Late Prehistoric stage occupation in the context area as well as the considerable variability in site type and location (Alexander et al. 1982; Andrefsky 1990; Jepson et al. 1992; Kalasz 1988; Loendorf and Loendorf 1999; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a). However, these investigations are of limited value for settlement discussions restricted to the Developmental period because of the absence of absolute dates that permit more precise temporal controls. As discussed earlier in this chapter, such a deficiency is one of the more pronounced drawbacks of survey-generated data. For example, of the 263 aboriginal sites recorded during the recent survey of the Picket Wire Canyonlands, only three could be assigned solely to the Developmental period based on relative dating of diagnostic artifacts (Reed and Horn 1995:61). In contrast to the larger Arkansas River Basin, the Park Plateau is characterized by a lack of extensive survey data. Most survey projects have tended to focus on limited segments of the landscape, either the major river corridors or the uplands. As a consequence it is difficult to evaluate the degree to which various portions of the plateau were utilized by prehistoric groups during any particular period.

Fortunately, data derived from large- and small-scale excavations of a variety of site types in a number of different environmental settings are available. Many of these investigations were conducted since publication of the previous research context (Andrefsky et al. 1990; Biella and Dorshow 1997a; Campbell 1969a; Charles et al. 1996; Dwelis et al. 1996; Hand and Jepson 1996; Hoyt 1979; Hunt 1975; Kalasz et al. 1993; Loendorf et al. 1996; McDonald 1992; Nowak and Kantner 1990, 1991; Schiavitti et al. 1999; Tucker 1991; Zier and Kalasz 1985, 1991; Zier 1989; Zier et al. 1996a, Zier et al. 1996b). These studies provide the chronometric control and subsistence data necessary for a more comprehensive view of Developmental period settlement-subsistence strategies. The spatial distribution of these radiocarbon dated Developmental period occupations encompasses a widespread series of rockshelter and open setting sites that are both architectural and nonarchitectural in nature.

Rockshelter sites located throughout the context area currently form the greater portion of the Developmental period site sample. These sites are reported along shallow drainages running through grasslands, e.g., Davis Rockshelter (Dwelis et al. 1996) and 5LA3189 (Loendorf et al. 1996); they are situated within shallow, incised canyons characterized by mixtures of riparian and grassland communities, e.g., Gooseberry Shelter (Kalasz et al. 1993), Two Deer Shelter (Zier et al.

1996a), and Recon John Shelter (Zier 1989); and they are located within relatively deep canyons that access numerous environmental niches, e.g., Metate Cave (Campbell 1969a) and Torres Cave (Hoyt 1979). Further, the Developmental period rockshelters exhibit considerable variability in associated features and artifact assemblages; such variability suggests that rockshelters served a number of different functions. The diverse and relatively abundant cultural materials associated with Torres Cave and Metate Cave are indicative of seasonal residences, albeit for small groups of people. Alternatively, the sparse remains recovered from Gooseberry Shelter and Two Deer Shelter suggest more temporary, limited-activity loci.

Open architectural sites are comparatively rare in the greater Arkansas River Basin; currently known examples include only the Belwood and Forgotten sites (Hunt 1975; Loendorf et al. 1996). Two houses are reported at each. Most striking are the disparities between these sites in setting, features, and cultural material. The Forgotten site is situated along a shallow intermittent drainage extending through gently rolling prairie on the PCMS; the Belwood site is located in a mixed ponderosa and juniper community in the vicinity of Graneros Canyon. Although both of these multiple dwelling sites probably represent seasonal residential bases for small groups of hunter-gatherers, only the Belwood site exhibits ceramics, bone awls, and a possible storage pit. The Forgotten site is notable for the presence of a number of hearths, "roasting pits or ovens," and enigmatic tabular sandstone rings (Loendorf et al. 1996). This evidence suggests some variability among the open architectural sites in duration of occupation, site function, and perhaps seasonality. Considerably more architectural sites are known in the southern Park Plateau area of northeastern New Mexico (Biella and Dorshow 1997a; Glassow 1984). These examples are discussed in greater detail below.

Open-setting, nonarchitectural sites in the greater context area as well as the southern Park Plateau are believed representative of "logistical" or specialized task loci within a larger settlement-subsistence system. These types of sites have been rarely excavated and have received only limited investigation in the greater Arkansas River Basin; Park Plateau examples are discussed further below. A unique example of a nonarchitectural open camp, 5EP935, was excavated in the context area east of Colorado Springs (McDonald 1992). This site was characterized by multiple features and diverse cultural debris including relatively abundant pottery. However, 5EP935 is located among low bluffs approximately 100 m from a rockshelter site (5EP2) that also exhibits significant Developmental period occupational remains. Therefore, it is difficult to isolate the functional role of 5EP935 from that of the rockshelter. More typical Developmental period open nonarchitectural sites have received minimal excavation but appear to represent specialized task loci. These sites include 5LA2169 in the Carrizo Creek area (Nowak and Jones 1984), and 5LA2240, 5LA3406, 5LA4632, and 5LA5621 on the PCMS (Andrefsky et al. 1990; Charles et al. 1996; Loendorf et al. 1996). These sites, located in a range of physiographic and biotic settings, are generally characterized by the presence of simply constructed hearths or roasting pits that vary considerably in size. Micro- and macrobotanical evidence is limited to samples from 5LA3406 and 5LA4632. These data in conjunction with the presence of ground stone and the paucity of faunal remains suggest that low-intensity vegetal processing was emphasized at these sites.

To summarize, it is obvious that Developmental period hunter-gatherers operating in the context area exploited resources in a wide range of environmental niches. The variability of site types associated with this spatial distribution suggests that Developmental period settlement-subsistence strategies were complex. The presence of multiple dwellings requiring considerable construction effort indicates that such a strategy incorporated a degree of sedentism and population aggregation. However, the lack of substantial middens suggests no more than temporary, seasonal residence for small bands or extended families. Speculations regarding possibly seasonal movements of Developmental period hunter-gatherer groups are offered by

Andrefsky (1990), Campbell (1969a), and Loendorf et al. (1996). Resolution of these models, however, requires a level of chronometric, subsistence, and seasonality data that is currently not available.

Similar conclusions have been drawn for Park Plateau settlement despite the general lack of comparable data sets spanning a range of environmental zones. Investigators in both the Cimarron and Vermejo districts note that Developmental period sites tend to be located on benches, terraces, or canyon rims above the flood plains of the plateau's major streams. In the Vermejo sample, more Developmental period sites are located near the valley margin, although the district as a whole should be considered an upland. Overall, Vermejo phase settlement patterns were primarily oriented toward the locations of wild seed-bearing plant resources.

Across the Park Plateau, research has tended to focus on residential sites, although a large number of limited activity loci have also been documented. However, most authors indicate that it is difficult to assign such logistical sites to particular temporal periods, either because they tend to lack diagnostic artifacts or because they are unlikely to contain significant subsurface deposits. Therefore, they have not been subjected to extensive excavation. Still, it is likely that the Developmental period occupation of the Park Plateau consisted of a complex network of functional site types. For the Vermejo district, Biella and Dorshow (1997b) note that many sites appear to have been occupied repeatedly, and that even relatively small sites tend to have very generalized assemblages reflecting a range of subsistence activities. This conclusion has also been reached by McKibbin et al. (1997) and others investigating the Trinidad district. Moreover, Developmental period sites were probably occupied by relatively small groups of people. Biella and Dorshow (1997b) note that this inference is true for both residential and nonresidential sites, suggesting that family or task groups may have remained together throughout some or all of the seasonal round.

Biella and Dorshow (1997b) confirm Glassow's observation that Developmental period architectural sites represent semimobile or semisedentary occupations (see Whalen 1994 for a summary of residential mobility studies). Activity diversity is higher among architectural sites than contemporaneous nonarchitectural sites, but most of this diversity can be explained by increased occupational duration. Further, the relatively thin middens associated with residential sites indicate that occupational duration was seasonal. Although topographic and architectural variables suggest that some sites may have been used during the cool seasons, the preponderance of botanical and faunal data indicate warm-season occupations (Biella and Dorshow 1997b).

Economy

A significant body of faunal and botanical data, both from the Park Plateau region and the greater context area, is available for examining Developmental period subsistence practices. Pollen and macrofloral samples indicate that Developmental period diets consisted primarily of wild resources, but that maize was a consistent if not significant segment of the diet. Macrofloral and pollen samples from across the context area and northeastern New Mexico are dominated by wild plant resources (Charles et al. 1996; Edwards 1997; Glassow 1980; Hand and Jepson 1996; Kalasz et al. 1993; Kirkpatrick and Ford 1977; Loendorf et al. 1996; McDonald 1992; Nowak and Kantner 1991; Puseman 1997, cited by Mitchell 1997; Tucker 1991; Van Ness 1986; Zier and Kalasz 1985; Zier 1989; Zier et al. 1996a, Zier et al. 1996b). Major economic taxa recovered include goosefoot, cactus (hedgehog, prickly pear, cholla), purslane, skunkbrush, pigweed, dropseed, and sunflower.

In the greater Arkansas River Basin east and north of the Park Plateau, charred goosefoot seeds are by far the most pervasive botanical remains recovered from Developmental period

contexts (Hand and Jepson 1996; Kalasz et al. 1993; Nowak and Kantner 1991:151; Tucker 1991; Zier 1989; Zier and Kalasz 1985; Zier et al. 1996a, Zier et al. 1996b). Other than an unusually high number of charred dropseed grass seeds from Two Deer Shelter (Zier et al. 1996a), quantities of charred remains other than goosefoot are strikingly low. It is currently unresolved whether this situation is due to preservation factors. Low numbers of maize remains are reported from a number of Developmental period contexts in the larger Arkansas River Basin. These include Recon John and Gooseberry shelters at Fort Carson (Kalasz et al. 1993; Zier 1989), 5LA2146 on Carrizo Ranches property (Nowak and Spurr 1989), and 5HF1109 on the Bucci Ranch (Zier et al. 1996b). Although these locations suggest widespread use of maize in the context area during the Developmental period, the sparse remains recovered indicate either a preservation problem or that maize horticulture was practiced only minimally.

On the Park Plateau, macrofloral assemblages from the Trinidad and Cimarron districts of the Park Plateau are generally more diverse than those of the Vermejo district, perhaps reflecting the lower altitude. Puseman (1997, cited by Mitchell 1997) documents nine species or families in 20 samples from sites 5LA1211 and 5LA1416. All 20 are derived from features dated to the Developmental period, or assigned to the Developmental period on the basis of stratigraphic position or assemblage characteristics. Major economic taxa include sunflower, cholla, Indian ricegrass, pinyon pine nut, chokecherry, juniper berry, and yucca. Recovered cultigens included maize and beans. Maize is particularly common, appearing in nine of 10 samples from 5LA1416 and all 10 from 5LA1211. Unfortunately, the sample processing procedures used by the original excavators are likely to have systematically excluded the smallest seeds, including goosefoot and amaranth.

Very similar results were obtained for Vermejo and Pedregoso phase sites in the Cimarron district. Kirkpatrick and Ford (1977) report the charred remains of chokecherry, wild plum, marsh elder, yucca, and pinyon pine nuts and juniper seeds from the Vermejo phase structure at site MP4. In addition to these wild plants, the midden at NP 1E, a Pedregoso phase site, yielded charred seeds from skunkbrush, amaranth, goosefoot, sunflower, and beeweed. Beans and maize were recovered from both sites. Similar results are reported by Toll (1988) for two Developmental period sites along the lower Cimarron River.

Several conclusions can be drawn from these data. First, domestic plants including beans and maize were available to the Developmental period inhabitants of the Park Plateau. What remains unresolved is the degree to which the cultivation of maize or beans was integrated into daily economic practice. Given the characteristics of the associated ground stone assemblage and the locations of Developmental period sites, it is likely that maize was a minor component of the overall diet. Maize remains appear to be somewhat more common in the Trinidad and Cimarron districts, both of which are lower in elevation than the Vermejo district, particularly toward the end of the Developmental period. Dorshow (1995) notes that the frequency of maize decreases over the course of the Developmental period in the Vermejo district. This decrease may not reflect overall trends, however (Wetherbee Dorshow, personal communication to Mark Mitchell, 1998). Differences in maize frequency among the districts may reflect differing horticultural potentials across the Park Plateau.

Of particular interest is the degree of size and morphological variability in Park Plateau maize remains, characteristics that Kirkpatrick and Ford (1977:262) suggest indicate "a wide range of growing conditions and a lack of selection for a specific seed type." Given the semiarid nature of the plateau, and its short growing season, it may have been the case that Developmental period gardeners simply planted seed in favorable locations and invested relatively little time in weeding and cultivation. In this context, Snow (1991) argues that in northern New Mexico and southeastern Colorado the short growing season at elevations above 1830 m (6000 ft) occasionally

requires that maize be harvested "green." Such green kernels cannot be used as seed in the following year, and so a dependable source of viable seed must be developed. Thus, a seed exchange network would be required, even if maize or beans constituted a small but consistent component of Park Plateau diets. Small quantities of packaged seed have been recovered from rockshelters throughout the Arkansas and Canadian river basins (Simpson 1976; Mera 1944; Chase 1949; Lintz and Zabawa 1984).

The second conclusion that can be drawn from macrobotanical data concerns paleoenvironmental conditions. Though the relative frequencies of various wild plant remains in archaeological contexts are largely a function of cultural practices, it is also true that all of the important economic taxa are currently available on the plateau. This suggests that some proportion of the recovered plant remains, particularly uncharred specimens, may in fact constitute "noise" in the macrobotanical signal. This may also explain the apparently richer assemblages found in the Cimarron district as compared to the Vermejo district. Differences in soil acidity and precipitation may also be responsible for the relative paucity of macrobotanical materials in Developmental period contexts in the Vermejo district.

A wealth of faunal data is available from Developmental period contexts on both the Park Plateau and in the greater Arkansas River Basin. With regard to the latter region, substantial faunal assemblages in particular are recovered in rockshelters. These sites include Recon John Shelter, Davis Rockshelter, Wolf Spider Shelter, Moonshine Shelter, Torres Cave, and Metate Cave (Campbell 1969a; Hand and Jepson 1996; Hoyt 1979; Zier 1989). Considerably smaller and more fragmentary assemblages are reported from the two open architectural sites, Belwood and Forgotten (Hunt 1975; Loendorf et al. 1996). The latter is characterized by particularly sparse and fragmentary faunal remains, which are believed to be largely representative of small mammals. In contrast, the remains of elk and deer as well as small mammals were recovered from the Belwood site. Again, this disparity may be related to differing site functions as well as preservation. In comparison, much more abundant and diverse remains were recovered from the rockshelters. Small mammals, especially cottontail, jack rabbit, and black-tailed prairie dog, are often prevalent, but large mammals such as deer, and to a much lesser extent pronghorn, bison, and elk, are also present. Other remains include those of bobcat, badger, fox and other canids, beaver, pocket gopher, vole, mouse, woodrat, chipmunk, squirrel, and various birds including owls. Nonmammal remains include frog or toad, crayfish, snake, lizard, and fish. Shell recovered from Developmental period occupations suggests the consumption of indigenous mussels (Nowak and Kantner 1991; Loendorf et al. 1996:115)

Similarly abundant faunal remains have been recovered from Developmental period contexts on the Park Plateau. Faunal data have been reported from both the Trinidad and Vermejo districts, but unfortunately, the bone from the Trinidad district cannot be assigned exclusively to the Developmental period. Data on 14 sites from the Vermejo district indicate that a relatively narrow range of species was utilized (Brown and Brown 1997). Among small mammal species the most important are cottontail and jack rabbit. Deer is the most common large mammal taxon; grouse and turkey are also important. Other taxa, including pocket gopher, vole, and woodrat are present in significant quantities, but the authors consider them intrusive. Pronghorn remains were recovered in small quantities.

Architecture

Examples of Developmental period architecture are known in the South Platte River Basin (Kalasz and Shields 1997; Nelson 1971; Tucker et al. 1992), the Arkansas River Basin (Campbell 1969a; Hoyt 1979; Loendorf et al. 1996; Hunt 1975), and on the Park Plateau (Biella and Dorshow 1997a; Glassow 1980; Kershner 1984; Mitchell 1997; Wood and Bair 1980). Of these,

considerably more examples are known outside the boundaries of the Arkansas River context area, in the southern portion of the Park Plateau.

Excluding the Park Plateau, Developmental period architecture in the context area is reported from Torres Cave, Metate Cave, the Forgotten site, and the Belwood site (Campbell 1969a; Hoyt 1979; Loendorf et al. 1996; Hunt 1975). Radiocarbon dates are associated with all but the first site named (see Table 7-4). Torres and Metate caves exhibit typical examples of Late Prehistoric stage rockshelter architecture, consisting of low semicircular rock walls that partition a portion of the shelter's interior. These are crudely constructed structures that do not exhibit evidence of post holes or formal interior features. In contrast, the open-setting structures at the Belwood and Forgotten sites are complex, single-room, shallow-basin houses with circular to oval floor plans and wooden superstructures. External as well as interior features were reported at both sites. Two houses were recorded at the Belwood site. House 1 is the more substantial of the two; it measures 8 m in diameter and incorporates a low slab wall that circumscribes the floor area. No central supports were reported; rather, the seven or eight postholes were arranged along the wall. Interior features included a central hearth and a subfloor, bell-shaped storage pit. House 2 measures 3.5 m in diameter and does not incorporate a rock wall. The floor area is defined by six posts set in a shallow depression; a presumed eastern entrance was described by the arrangement of five postholes. Cord-marked ceramics, bone tools, chipped and ground stone tools, and the remains of both large and small mammals were reported in the vicinity of the structures.

Excavation of two structures at the Forgotten site resulted in a description of architectural elements considerably more detailed than that provided for the Belwood site houses (Loendorf et al. 1996:112-116). House 1 exhibited an oval floor plan that measured approximately 4.0 x 4.5 m. A prepared floor surface was not evident. The structure incorporated an outer wall of upright sandstone slabs (some reaching 70 cm in height) tamped into an excavated trench and shimmed with smaller rock. An inner row of shorter sandstone slabs combined with the outer ring to form a substantial wall that may not have completely enclosed the structure. A entryway was not obvious but a portion of one side of the house may have been open. The investigators speculated that a clay soil mixture tamped around the wall elements was subsequently burned to provide a hardened concretelike foundation for the upright slabs. As with the Belwood site houses, no central supports were evident. Poorly defined post molds suggest that support poles were arranged along the wall and leaned inward. A series of upright slabs set approximately 1 m in from the slab wall exhibited crushed upper edges, suggesting that they functioned as "interior brace stones" supporting the leaning poles. Increased grass pollen levels in the structure suggest that the roof was thatched. Interior features included multiple hearths and "roasting pits or ovens" that would have been sheltered by the high, upright slab walls of the structure. House 2 had a circular floor plan with a diameter of 4.5 m. Structural elements were similar to those of House 1 but the House 2 wall rock was more substantial and less displaced. The multiple rows of sandstone slabs describing the wall of House 2 may have been 30-40 cm thick. Unlike at the Belwood site, subfloor storage pits were not present. A variety of chipped and ground stone tools was associated with the structures but no ceramics were found. Bone was sparse but botanical evidence suggests that goosefoot, cactus, and sunflower were processed in the vicinity of the dwellings.

Considerable data are available regarding the attributes of Developmental period architectural features on the Park Plateau. Moreover, these attributes are variable across the Park Plateau as well as through time. The best-dated architectural sequence comes from the Vermejo district. Biella and Dorshow (1997b) report on four semisubterranean pit structures that date to the period A.D. 160-680. The average date is A.D. 503. These structures are ovoid and enclose areas ranging from 18.9 to 47.6 m^2. One side of each structure was excavated 36 cm to 80 cm into a shallow slope. The opposite side of the basin-shaped floor sloped up to the aboriginal ground surface. The lower portions of the walls were constructed from earth and the superstructure

consisted of "wood and thatch walls and post-supported roofs" (Biella and Dorshow 1997b:961). Floor features include large central firepits and small storage pits.

Six above-ground circular stone enclosures have also been excavated in the Vermejo district. In most respects these structures are similar to the circular stone enclosures from the Belwood and Forgotten sites and to Vermejo phase structures from the Cimarron district. The mean calibrated occupational date for these six structures is A.D. 787. Kershner (1984) provides two uncalibrated mid-seventh century dates for a similar though larger structure. In plan view each was roughly circular or oval and between 2.9 and 5.9 m in diameter. Interior floors were unprepared and basin shaped, and contain unprepared fire pits, small floor pits, and deep, bell-shaped refuse and burial pits (Biella and Dorshow 1997b:963). Three of the structures also contained slab-lined wall bins. Most of these architectural features consisted of a single room with superstructures that may have been constructed of brush. However, in one case three such enclosures were contiguous. Some sites also exhibited partially walled "plazas," or activity areas. Most of these structures were associated with external firepits and use surfaces, suggesting that a variety of activities took place outside the enclosure.

Both semisubterranean pit structures and circular stone enclosures were frequently associated with deep bell-shaped cists. Dates for these features span most of the Developmental period. The cists were generally large, measuring as much as 1.7 m in depth. Basal diameters ranged from 1.65 to 1.87 m, and rim diameters ranged from 0.95 to 1.4 m (Biella and Dorshow 1997b:965). All of these features have been burned, either during use or as a means of sealing the walls against rodents and insects.

Although excavation data are limited, both pit structures and stone enclosures have been documented in the Cimarron district. Glassow (1980) defines the Vermejo phase (A.D. 400 - 700) by the presence of circular stone enclosures similar in many respects to Developmental period structures from the Vermejo district, as well as to the Belwood site structures from southeastern Colorado (Hunt 1975). The principal excavated example was roughly 5.5 m in diameter (Glassow 1980:Figure 6). Though somewhat irregular in plan view, the enclosure approximated a circular configuration. The walls were constructed from horizontal stone slabs to a height of at least 1 m. Techniques of roof construction were not clear, although several large postholes were noted in the floor. Other floor features included a variety of cists, pits, and depressions. A radiocarbon date of A.D. 510 (uncalibrated, 1460 ± 50 B.P.) was obtained on roof-support post fragments from a posthole. Most Vermejo phase sites contain only one stone enclosure.

Architectural features associated with other Developmental period phases in the Cimarron district are less well understood. The succeeding Pedregoso phase (A.D. 700 - 900) appears to have included very shallow pit structures excavated into low, sloping terraces, in addition to firepits, linear stone alignments, bell-shaped pits, and scattered posts (Glassow 1980: 72-73). Unfortunately, many of the features were disturbed by subsequent occupations. The relatively thick middens associated with the features have produced a diverse assemblage of artifacts and botanical and faunal remains, including oxidized ceramics and maize cob fragments. Radiocarbon samples were obtained from two bell-shaped pits associated with this midden, both of which date to the middle of the eighth century (A.D. 750, or 1200 ± 80 B.P., and A.D. 755, or 1195 ± 80 B.P.). The apparent inversion of the Vermejo-Pedregoso architectural sequence, as compared to the sequence developed for the Vermejo district, may be attributable to sampling error, owing to the vagaries of radiocarbon dating and the limited excavation data from the Cimarron district.

One of the most unusual architectural features in the Cimarron district has been assigned to the Escritores phase (A.D. 900-1100). This moderately deep, slightly irregular pithouse measured roughly 4.5 m in diameter and included a low bench along one wall, a quadrilateral roof-

support post configuration, and an east-facing ventilator. Other floor features included a subfloor human interment, a firepit, and a variety of small postholes or depressions. Although similar to Valdez phase pithouses from the Taos district, the Escritores phase pithouse was less formal. No other Escritores phase structures have been excavated, and the range of architectural variation is therefore unknown. No radiocarbon dates are available for this structure or associated middens, although associated ceramics argue for an occupation in the early Diversification period (post-A.D. 1050). However, the relationship between this structure and other architectural forms of the Developmental or Diversification period is unclear.

Even less is known about Developmental period architectural features from the Trinidad district. Only one excavated structure has been confidently dated to the Developmental period. This feature (Structure 6 at 5LA1416) consisted of a shallow pit with a ramp entryway (Mitchell 1997; Wood and Bair 1980). Floor features included a small firepit and a small subfloor storage cist. A charcoal sample from floor fill dates to A.D. 895 (cal 1140 ± 60 B.P.). Based on associated ceramics, several other somewhat deeper pit structures without ramp entryways (Structures 5 and 6 at 5LA1211) may also date to the late Developmental period. Available archaeomagnetic dates are equivocal on this point, however (Mitchell 1997). At least some shallow pithouses, including one with a ramp entryway, were also occupied during the early Diversification period in the district.

It is perhaps significant that the only other excavated Developmental period structure in the Trinidad district is also a pithouse. The Running Pithouse site is located in Reilly Canyon, a major tributary of the Purgatoire River, and consists of four amorphous "rooms" separated by low partitions and benches (Dick 1974). A variety of postholes was defined, but no other floor features were noted. Although excavation data are limited, it is clear that the structure is unlike either the Escritores phase pithouse of the Cimarron district, or Valdez phase pithouses of the Taos district. It is also unlike the pit structures of the late Developmental or early Diversification period in the Trinidad Lake project area. The artifact assemblage associated with this structure includes corner-notched or stemmed projectile points, bone awls, maize remains, bone beads, and ground stone tools. Significantly, no ceramic artifacts were recovered. For this reason, both Ireland (1974a, 1974b) and Eighmy (1984) place this structure within the first millennium, although its age is not confirmed.

Directions for Future Research

Chronology

It is essential that firm associations between absolute dates and cultural attributes in the Developmental period be established. Although the presence of Developmental period populations is well established in the context area by a number of radiocarbon dates, questions pertaining to the archaeological constituents of such occupation remain unresolved. Larger block excavations permit the recovery of well-dated cultural remains that are crucial for comparison and contrast of the various cultural taxa. Further refinement of the temporal range for the Developmental period must begin with more precise assessments of attributes that distinguish this taxon from the preceding Late Archaic period and subsequent Diversification period. Future large-scale investigations, particularly block excavations, and the development of additional methods for discerning variability in architecture, technology, settlement, and economy, may facilitate more accurate appraisals of these still tenuously defined cultural-temporal groups. Therefore, to a certain degree, chronological research becomes interwoven with the other main themes discussed below. In summary, the acquisition of additional absolute dates, especially those describing the temporal fringes of cultural taxa, will become more meaningful only if accompanied by adequate artifact, subsistence, and feature data.

- What attributes, or combinations thereof, may be used to further distinguish Developmental period occupations from those that are of the Late Archaic period or Diversification period?

- Do occupations situated near the margins of the Developmental period temporal range exhibit mixed assemblages that include materials typically associated with occupations of the Late Archaic and Diversification periods?

Regional differences within the temporal span of the Developmental period must be elucidated. It is highly unlikely that the characteristics that distinguish Developmental period occupation were distributed across the context area at a uniform rate. Pockets of resistance to the introduction of bow-and-arrow and ceramic technology, for example, may have extended well beyond A.D. 100. Similarly, the adaptive mode of the Developmental period may, in certain areas, have extended well into the Diversification period. Identification of these particular situations and related causal factors have important implications for regional chronology building.

- When, and in what portion(s) of the context area, did Developmental period occupation first become recognizable?

- When and where (e.g., north of the Arkansas River versus the southern Park Plateau) did the final representation of a Developmental period occupation occur?

Population Dynamics

The notion that the Developmental period represents a widespread, relatively uniform cultural manifestation characterized by minimal external influences needs to be fully investigated. Currently, large portions of the context area have witnessed only minimal archaeological investigation. The spatial distribution of Developmental period populations may be only roughly drawn, but current evidence indicates that they extended beyond the Arkansas River Basin to the north and south. The eastern and western borders, however, are only poorly known. Analysis of Developmental period occupation should minimally encompass the South Platte River basin, the Park Plateau of southeastern Colorado and northeastern New Mexico, and the plains, foothill, and high altitude regions of the Arkansas River Basin. Evidence of interaction among these various Developmental period populations, and with culture groups from surrounding areas, is known from relatively few sites.

- What attributes or characteristics distinguish context-area occupation during the Developmental period from those of the surrounding regions, particularly with regard to the plains groups located east of the Arkansas River Basin?

- How far west into the upper Arkansas, Huerfano, Cucharas, and Purgatoire River drainages does Developmental period occupation extend?

- To what extent are exotic materials representative of exchange systems present in general contexts of the Developmental period; are they associated with burials?

- What is the evidence for trait diffusion during the Developmental period (e.g., architectural styles, pottery decoration)?

Population growth and aggregation during the Developmental period require further investigation. It remains unresolved whether the greater number of dated Developmental period sites relative to the Late Archaic period reflects a population increase. A number of

geomorphological factors, including the erosion of Archaic living surfaces, could also account for this situation. Furthermore, regional variation in this purported population increase has not been addressed adequately. Finally, the degree of population aggregation and concomitant social organization suggested by some Diversification period architectural sites has thus far not been demonstrated by Developmental period groups. Whether this represents some sort of evolutionary cultural process remains to be explored.

- Does the evidence for a Developmental period population increase extend throughout northeastern New Mexico as well as the larger context area?

- Can any regional variation in population numbers be attributed to climatic fluctuations?

- Are there Developmental period architectural sites whose size and assemblage diversity suggest increasing population aggregation and social organization, and are such sites restricted to regions south of the Arkansas River?

The process of defining phases within the Developmental period should be attempted only with adequate data. A number of different site assemblages should be analyzed, especially if the justification is centered on previously held geographical distinctions (e.g., Arkansas River versus South Platte River basin populations, and southeastern Colorado versus northeastern New Mexico populations). Currently, no single, widely accepted phase-level taxonomy is defined for the Developmental period. Furthermore, Developmental precursors to the Apishapa and Sopris phase distinctions defined for the succeeding Diversification period have not been discerned. Developmental period occupation of the upper Purgatoire region, for example, is not well understood. Determining how this expression differed from contemporaneous occupation of northeastern New Mexico, or the eastern plains manifestations that preceded the Apishapa phase, is difficult given available data sets. There is no confirmed evidence that upper Purgatoire groups of this period maintained relationships with the Southwest to the extent that typified the succeeding Sopris phase. However, as reporting improves and more excavation data become available, differences among the various regional populations may become apparent.

- Is there a Developmental period precedent for the extensive interaction with the Rio Grande valley that characterizes the Sopris phase?

- Are the differences seen among Developmental period adaptations in the Arkansas River Basin, as opposed to the southern Park Plateau, sufficient so that phase distinctions can be justified?

- Do Arkansas River Basin and South Platte River Basin occupations exhibit the contrast necessary to define separate phases?

Technology

Ceramic technology and the introduction of the bow-and-arrow are currently among the most prominent attributes used to define the onset of the Developmental period. That said, a number of questions remain regarding these artifact types that need to be resolved. First, solid contextual associations between radiocarbon ages (especially those ranging between 2200 and 1500 B.P.), pottery, and projectile points are still relatively rare. Specifically regarding projectile points, the effect of curating earlier Archaic dart points during the Developmental period needs to be further explored. Although the evidence gathered to date indicates a strong correlation between small, corner-notched points and Developmental period occupations, no ceramics are fully diagnostic of this taxon. That cord-marked Developmental period pottery can be distinguished

from similarly decorated Diversification period ceramics on the basis of morphology is yet to be firmly established. Perhaps attributes other than cord marking need to be examined in greater detail. Similar problems with temporal and cultural associations are noted for the oxidized, sand-tempered pottery found on the Park Plateau. Given the small, fragmentary pottery samples associated with most projects, researchers in the context area would benefit greatly from a regional synthetic approach. Such an approach would entail increasing sample sizes by incorporating collections from a number of surveys and excavations. Observations gleaned from larger samples may facilitate discernment of more subtle temporal and regional trends in ceramic construction. For example, it would be particularly beneficial for one or more ceramic analysts to compare a large sample of cord-marked or polished specimens from a number of Arkansas and South Platte River Basin projects.

- Does hafted biface evidence suggest a continuation of atlatl use during the Developmental period, or alternatively, that the Archaic points were simply picked up and modified for use as knives and scrapers?

- Does bow-and-arrow technology generally precede that of ceramics within the context area; are there specific regions where the opposite is true?

- How does Developmental period cord-marked pottery differ from that which was manufactured during the Diversification period?

- What is the morphological range of ceramics recovered from the upper Purgatoire region during the Developmental period, and how does it compare with that associated with southern Park Plateau occupations?

Effort should be made to establish diagnostic patterns of Developmental period lithic tool production and use, and lithic research in the context area would be well served by firmly establishing baseline technological trends. The main point here is that some "big picture" observations need to be considered in conjunction with the interpretation of individual, formally patterned diagnostic tools. Debitage and minimally modified tools should not be overlooked in assessing overall manufacturing and use strategies.

- Does a combined emphasis on bifaces and minimally modified flake tools hold true for all Developmental period sites?

- Is there greater use of expedient tools at Developmental architectural sites than, for example, Archaic rockshelters?

- Are all Developmental period residential bases characterized by late-stage manufacture and tool refurbishment?

- Do all Developmental period ground stone assemblages represent an expedient tool manufacturing strategy?

- Does macro- and microbotanical evidence indicate a correlation between ground stone form and the processing of specific economic items?

Additional source analyses are needed to further establish trade and other forms of interaction during the Developmental period. For both ceramic and lithic studies, petrographic analyses greatly enhance our knowledge of manufacture origins and interregional relationships. Such studies would include source analyses for the rock temper used to manufacture pottery and

for obsidian that is commonly used in the manufacture of stone tools. The former may, for example, facilitate the identification of locally manufactured cord-marked pottery as opposed to that imported from surrounding regions. Additionally, further research into lithic procurement sites and quarry locations within the context area is greatly needed. Finally, species identification for shell tools and ornaments can provide important information about exchange patterns.

- How do Developmental period contexts from the upper and lower Purgatoire River regions compare in the sources for temper used in pottery manufacture?

- Does petrographic analysis of rock temper indicate that Developmental period ceramic collections represent highly localized manufacture?

- Does Alibates dolomite occur only in Developmental period contexts south of the Arkansas River; to what extent are "false" Alibates sources represented in southeastern Colorado (i.e., materials similar in appearance to Alibates dolomite from the Texas panhandle)?

- Does all the obsidian associated with Developmental period contexts originate in northern New Mexico?

- How should "local" and "nonlocal" stone sources be defined for Developmental period occupations in various portions of the context area?

Settlement and Subsistence Strategies

Developmental period sites exhibit considerable variability in setting as well as artifact and feature composition. However, sampling bias undoubtedly plays a role in our current perception of Developmental period settlement-subsistence systems. It is important to reiterate that large portions of the context area, particularly the northern expanses, remain unsurveyed. Furthermore, much of the survey information associated with the context area was recovered in the course of a few large-scale projects in the southern region. As is the case with all cultural taxa defined for the context area, excavation data from a variety of site types and environmental settings would greatly benefit Developmental period settlement and subsistence research. Relatively few excavated sites have been relied upon for more detailed interpretations of settlement, and these sites were often subjected only to limited testing. Overall, investigation of the functional and temporal relationships among the various Developmental period site types is still in its infancy. In southeastern Colorado, rockshelter sites in canyon settings have to date been more commonly encountered than architectural sites in open settings. Therefore, a greater number of rockshelter sites has been subject to some level of excavation. However, the few open architectural sites that have been excavated were more exhaustively studied. A single example, the Belwood site, has long been cited in definitions of the Developmental period. In northeastern New Mexico, Developmental period architectural sites have similarly received the lion's share of investigative attention. Throughout the region, open-setting nonarchitectural sites, both with and without fire-related features, have received only minimal attention. Conversely, discernment of regional and temporal variation in rock art sites has been advanced in recent years with improving chronometric and recording techniques.

- Overall, does the range of site types associated with the Developmental period reflect either a collector or forager strategy within Binford's (1980) settlement model; alternatively, is neither strategy particularly relevant for the context area?

- What evidence is there to suggest the extent of Developmental period seasonal rounds?

- Are sites confined to plains drainage systems, or do they extend to higher elevations in the Rocky Mountains?

- Are Developmental period rockshelter and open nonarchitectural occupations generally reflective of short-term, limited-task operations, and are these occupations (particularly the latter) generally associated with a wide range of environmental settings?

- Do Developmental period architectural sites generally represent residential bases characterized by multiple, domestic-task activities and relatively long term occupation?

- Are Developmental period architectural sites more likely to occur in canyon settings?

- What is the range of site types and settings associated with Developmental period rock art?

Comparison should be undertaken of Developmental and Late Archaic economies, and in particular the degree to which the Developmental period economy represents a continuation of that of the Late Archaic period. For both periods, a generalized hunter-gatherer strategy centered on the procurement of nondomesticated plants such as goosefoot and a variety of small mammals (primarily leporids) and artiodactyls was emphasized. Although sparse maize remains have been recovered from both Late Archaic and Developmental contexts, a dual foraging-horticultural economy is generally not associated with either period.

- What evidence is there to indicate that either minor or major economic changes accompanied the shift from the Late Archaic period to the Developmental period?

- Did the distribution of maize became more widespread after the Late Archaic period?

A consensus exists among regional archaeologists that the role of cultigens in the Developmental period economy was relatively minor. However, the possibility for regional variation in the use of maize warrants further examination, particularly with regard to comparisons between northeastern New Mexico and the greater Arkansas River Basin. Related research concerns pertain to the variability in site types associated with maize, and the degree to which maize was distributed through the context area. Although wild plants are firmly established as a staple in the Developmental period diet, a number of questions linked to their use are worthy of investigation. In particular, the pervasiveness of goosefoot should continue to be addressed. Additional avenues of research include regional variation in procurement of wild plants, and determining what types of features are associated with plant processing. Although terms such as roasting pit are applied to features in the context area, there is little agreement on what actually constitutes such an occurrence.

- Was maize more prevalent on the Park Plateau than in other regions during the Developmental period?

- Are Developmental period maize remains primarily present in rockshelters situated along major drainages?

- Is there evidence of Developmental period maize storage facilities?

- Is the presence of maize in the context area the result of trade or a seed exchange system, or both?

- Is the pervasiveness of goosefoot actually the result of preservation factors, i.e., does this plant exhibit a greater capacity to become preserved in archaeological contexts?

- Was goosefoot preferred among Developmental period populations because its growth was more easily encouraged by hunter-gatherers occupying seasonal camps situated in marginal environments?

- Are wild plant remains associated with Park Plateau occupations more diverse than those recovered from plains occupations in the context area?

- What evidence is there for the use of specialized plant processing sites during the Developmental period?

- What is the evidence for storage of wild plants during the Developmental period?

- Are there correlations between feature morphology and wild plant remains?

The faunal record suggests an emphasis on jack rabbits and cottontails in Developmental period subsistence throughout northeastern New Mexico and southeastern Colorado. However, as with plant utilization, there is reason to examine more closely regional and site type variability in faunal assemblages. For example, rockshelters in plains settings have produced most of the largest faunal collections in the Arkansas River Basin. Bone recovery from the few open architectural sites in such settings has been remarkably sparse. In contrast, open setting architectural sites in northeastern New Mexico have relatively large and diverse faunal collections. Furthermore, the bison-oriented assemblages of architectural sites of the subsequent Apishapa phase do not appear during the Developmental period, even on a minor scale.

- What is the evidence for regional and site type variability in Developmental period faunal assemblages?

- Do any Developmental period sites indicate an emphasis on bison procurement?

- Which site types exhibit the most diverse and abundant faunal assemblages?

- What are the primary methods of Developmental period faunal procurement, and is there evidence of game drives?

Establishment of the regional and temporal variability in Developmental period architecture should be a primary research objective. The number of Developmental period architectural sites recorded in the last 15 years has increased significantly, and much data synthesis is needed to interpret adequately the results. It is yet to be firmly established whether architecture of the Developmental period has comparable Late Archaic antecedents, and how Developmental period structures compare with those of the subsequent Diversification period. It is also crucial to verify the relationships among Developmental period structures found in northeastern New Mexico, southeastern Colorado, and the South Platte River Basin. Indeed, information presented in research documents from adjacent areas may suggest additional avenues for investigating architectural origins and links. Currently, the Developmental period architectural sample from southeastern Colorado is small relative to that of the southern Park Plateau. Additional block excavations will undoubtedly provide a solid foundation for interregional comparison of architectural attributes. In addition to overall plan and profile views, the recording of architecture in the context area should minimally include descriptions and/or detailed diagrams of wall construction and slab placement, morphology of internal and external

features, the size and alignment of support posts, and the location and composition of associated artifact concentrations.

- When and where did aggregated room structures first appear, and is room aggregation associated only with the Diversification period?

- Are prepared floors and formal interior features associated with Developmental period structures, or are these attributes primarily Diversification period architectural innovations?

- How does architecture of the Developmental period vary within the context area, and between the context area and northeastern New Mexico?

- How does Developmental period architecture in the context area compare with examples from surrounding regions, particularly the South Platte River Basin?

Geomorphology and Paleoclimates

Dramatic departures in paleoclimatic trends are believed not to have occurred during the transition from the Late Archaic to the Developmental period (Archaic stage to Late Prehistoric stage). On balance, the climate was probably somewhat cooler and wetter than that of the present, but comprehensive data from archaeological sites of the Developmental period suggest that floral and faunal communities were essentially modern. Nevertheless, the nature and timing of climatic fluctuations within the period, and their possible effects on human adaptation, are poorly understood. Likewise, geomorphic processes have been described from only a few locations around the context area, and such processes have been dated only in a very broad sense.

- What paleoenvironmental conditions prevailed during the Developmental period, and are significant changes from the Late Archaic period detectable?

- What were the predominant geomorphic processes affecting landscape development in the Developmental period?

- Is the limited evidence of landscape stability from a few localities (e.g., Turkey Canyon at Fort Carson) widespread throughout the context area during this period?

- Are there small-scale episodes of sand dune/sand sheet activation within the Developmental period that might indicate episodes of climatic change?

- What soil formation processes prevailed, and can soils dating to this period be identified on a regional scale?

- If intact terrains of Developmental period age are present, how would soil-forming processes and more general geomorphic processes have affected internal site structure?

DIVERSIFICATION PERIOD

Introduction

The Diversification period of the Late Prehistoric stage dates from approximately A.D. 1050 to 1450 and therefore largely corresponds to the Middle Ceramic period as defined in the previous research context (Eighmy 1984). Two phases, believed to have common origins in the Developmental period, are defined within the Diversification period: the Apishapa phase (A.D. 1050-1450) and the Sopris phase (A.D. 1050-1200). It is emphasized that because large portions of the context area have received relatively little archaeological investigation, particularly the northern expanses, unrecorded but contemporaneous cultural remains may exist that are unrelated to either phase. Furthermore, recorded sites associated with limited data sets may represent manifestations that are not affiliated with either the Sopris or Apishapa phase. The poorly known, spaced stone foundations and enigmatic cobble foundation structures previously discussed in the Late Prehistoric stage architectural synthesis (this chapter) are possible examples of such manifestations. The meager data sets associated with these sites currently restrict further refinement of phase distinctions during the Diversification period.

This segment of prehistory is generally distinguished by the construction of multiroom architectural settlements that are larger and more complex than those of the preceding Developmental period. Diversification period structures were probably occupied for longer periods of time, and used more intensively, than Developmental period structures. The term "Diversification" is applied to this period because the phase distinctions, as well as intraphase variability in such crucial aspects as architecture, emphasize a degree of directional change in the context area that was not apparent previously. Overall, the density and diversity of architecture, features, and associated debris indicate that the context area witnessed peak levels of prehistoric population and sedentism. However, the possible catalysts for these circumstances, such as climatic conditions, increased food production, innovations in storage, stress brought on by drought or warfare, or some combination of these factors, are yet to be fully identified.

The two major phases of the Diversification period, Sopris and Apishapa, are believed by most investigators to have grown from a common origin in the Developmental period (Kalasz 1988; Lintz 1984; Mitchell 1997; Wood and Bair 1980:241; Zier et al. 1988). Alternatively, Schlesier (1994) sees the Sopris phase as an incursion of Athapaskans beginning approximately A.D. 1000. However, the latter thesis relies heavily on scant dental evidence derived from a sample of 13 human mandibles (Wood and Bair 1980:Appendix I). Apishapa phase populations exhibit eastern Plains Village influences expressed by the concept of the Upper Canark Regional Variant (Lintz 1984), and the less widespread Sopris phase maintained social and economic ties with ancestral Pueblo groups in the northern Rio Grande valley (Mitchell 1997). The precise nature of the distinctions between the Sopris and Apishapa phases is yet to be explored fully, and sites which might suggest interaction between the two have not been identified.

Chronology

In the 15 years since publication of the previous research context (Eighmy 1984), numerous radiocarbon, archaeomagnetic, and cation-ratio dates have been obtained from Diversification period sites (see Appendixes A and B). Recent excavations at the Cramer site, Avery Ranch site, and Ocean Vista site, the reexamination of materials from 5LA1416 and the Leone Bluffs site, and various investigations on the PCMS, Chaquaqua Plateau, and Carrizo Ranches property are particularly appropriate for examination of the range of variability that characterized this period (Andrefsky et al. 1990; Gunnerson 1989; Kalasz et al. 1993; Loendorf et al. 1996; Mitchell 1997; Nowak and Kantner 1990, 1991; Rhodes 1984; Zier et al. 1988; Zier and

Kalasz 1985). The absolute dates accumulated in recent years, as well as reexamination of those recovered from earlier investigations, offers some new insight into the shift from the Developmental period to the Diversification period. However, archaeological perception of this shift is still plagued by the same chronological and conceptual problems enumerated throughout this volume. The shift was probably not uniform across the context area, and the chronometric precision necessary to date the transition is undoubtedly compromised by old wood/heartwood factors and/or by the lack of well-defined stratigraphic relationships between absolute dates and occupational surfaces.

Available chronological data are indicative of considerable temporal overlap between Sopris and Apishapa phase occupations. A detailed reexamination of available radiocarbon and archaeomagnetic samples from two major Sopris phase settlements was recently completed by Mitchell (1997). This study considers the stratigraphic relationships of the dates and their associations with relatively dated artifacts such as ceramic types; additional factors such as the old wood/heartwood influence are closely examined. The author concludes that "...it is probable that the occupation of these sites began by at least A.D. 900, and continued until some time shortly after A.D. 1200" (Mitchell 1997:93). Such an all-encompassing, rigorous synthesis has not been accomplished for Apishapa phase architectural sites. Chronological control for Apishapa sites is inhibited by a paucity of large-scale block excavations. Additionally, the shallow deposits typical of Apishapa phase site locations are often characterized by collapsed or intermixed stratigraphy. These conditions have made it difficult to confirm consistently the relationships among individual dates, diagnostic artifacts, and occupational surfaces. Southeastern Colorado investigators have placed the beginning of the Apishapa phase in the A.D. 800-1000 range (Kalasz et al. 1993; Lintz and Anderson 1989; Nowak and Kantner 1991; Zier et al. 1988), but most believe that what is sometimes termed "full-blown" Apishapa culture, or the most obvious expression of the manifestation, begins at A.D. 1000 and starts to disperse by A.D. 1300 (Campbell 1969a:389; Eighmy 1984; Lintz and Anderson 1989:25).

Delineating the shift from the Developmental to the Diversification period is often difficult because of our vague and limited understanding of the differences between them such as corner-notched versus side-notched points, the presence of abundant cord-marked ceramics, and single-room versus aggregated room structures (Gunnerson 1989:12). Perhaps for this reason, as well as those related to the limitations of radiocarbon dating, the beginning of the Diversification period is often presented with a 100- or 200-year buffer as in A .D. "800/1000" or "A.D. 900/1000" (Lintz and Anderson 1989:21; Mitchell 1997; Zier et al. 1988). Given that the Sopris and Apishapa phases are believed not to represent a sudden incursion of new populations into the area, it is reasonable to suggest that the progression from the Developmental to the Diversification period is often subtle and protracted. The "diversification" seen at A.D. 1000 in some portions of the context area may have occurred later or not all in others. Because this shift involved indigenous populations that had occupied the region for centuries, it is likely to have been characterized by considerable overlap in settlement-subsistence strategy and associated architectural forms. Although the larger, more intensively occupied settlements of the Diversification period certainly stand out (e.g., 5LA1416 and the Leone Bluffs site, and Gunnerson's [1989] "Classic Apishapa" sites), differences among other site types of the Developmental and Diversification periods may have been minimal. Echoing Gunnerson's viewpoint (1989:12), the authors believe that many sites within the broader Apishapa or Sopris phase settlement pattern are virtually indistinguishable from those of the Developmental period. This situation necessitates that caution be exercised in assessing dates believed to signal commencement of the Diversification period.

Additional difficulties in chronological ordering are suggested by the wide temporal range, sometimes enduring for several centuries, of absolute dates associated with specific

architectural sites of the Diversification period. This phenomenon is particularly evident at Apishapa phase loci such as the Cramer, Mary's Fort, Ocean Vista, and Avery Ranch sites; and the Sopris phase sites of Leone Bluffs and 5LA1416 (Kalasz et al. 1993; Mitchell 1997; Wood and Bair 1980; Zier et al. 1988; Zier and Kalasz 1985). The suite of radiocarbon dates that Gunnerson (1989:53-57) recovered from the Cramer site describes a continuum from approximately A.D. 900 to 1400. However, all but the most recent are rejected on the basis of a presumed problem of old wood/heartwood. A similar conclusion was reached by Zier et al. (1988:255-257) in interpreting the bimodal distribution of radiocarbon dates recovered from the Avery Ranch site; dates earlier than the A.D. 1160-1290 cluster were ascribed to the wood sampling problem noted by Gunnerson (1989). However, Zier et al. (1988) do present the possibility for multiple occupations of the Avery Ranch site beginning approximately A.D. 1000 or earlier. This interpretation was based on the fact that a few Scallorn points, generally indicative of occupation during the Developmental period, were possibly associated with the earlier radiocarbon dates. Subsequent test excavations at the nearby Ocean Vista site similarly revealed the presence of earlier dates and diagnostic artifacts suggestive of multiple components culminating in an Apishapa phase occupation (Kalasz et al. 1993:208). Evidence for multiple components at Ocean Vista was somewhat stronger than that recovered from the Avery Ranch site; two Scallorn points and a calibrated radiocarbon date of A.D. 657 were associated with a common provenience. Still more conclusive evidence for multiple components at large sites of the Diversification period was revealed by the recent re-examination of Sopris phase dates (Mitchell 1997:89-93). Thus, the presence of components of the Developmental period (or earlier) among Diversification period architectural sites may not necessarily reflect false radiocarbon age assessments. Evidence shows that the larger architectural site locations of the Diversification period apparently represent optimal or preferred settings that were occupied repeatedly throughout the Late Prehistoric stage.

The multicomponent phenomenon suggestive of a gradual progression from the Developmental to the Diversification period has significant implications for interpretation of site affiliation in the context area. Given the shallow, rodent-disturbed, often broken stratigraphy typical of Diversification period architectural sites, the intrusion of earlier materials may be a relatively common occurrence (Kalasz et al. 1993; Mitchell 1997; Zier et al. 1988; Zier and Kalasz 1985). Avery Ranch site investigators note that "it is possible that artifact assemblage differences between two major components are indistinguishable due to the relatively short period of time elapsed between the two (ca. two centuries) and/or the similarities in economic adaptations. It is also possible that remnants of two components have become hopelessly mixed as a result of natural and cultural factors (rodent and root disturbance; post-abandonment reuse of living/work space; recent military impact) (Zier et al. 1988:256)." Therefore, as a cautionary note, dated materials reflecting a Developmental-Diversification period continuum may represent the reuse and refurbishment of architectural loci over several centuries. The absence of well-defined stratigraphic relationships in such situations makes it difficult to discern which date reflects the end of one period and which the beginning of the next.

Important Diversification period sites in the context area are shown in Figure 7-2.

Population Dynamics

The profusion of architectural sites that suggest increased populations is described in the Late Prehistoric stage overview, above. That the number of architectural sites reaches its ultimate expression during the Diversification period is well documented (Kalasz 1988:Table 1; Loendorf et al. 1996:Table 7.4; Mitchell 1997:Table 5.2-5.4). For reasons not yet established, populations were assembling at specific sites in much greater numbers than was true during the previous Developmental period. The well-known multiroom, "fortified" enclosures of the Apishapa phase are most prevalent in the Purgatoire and Apishapa river areas; the large Sopris phase settlements

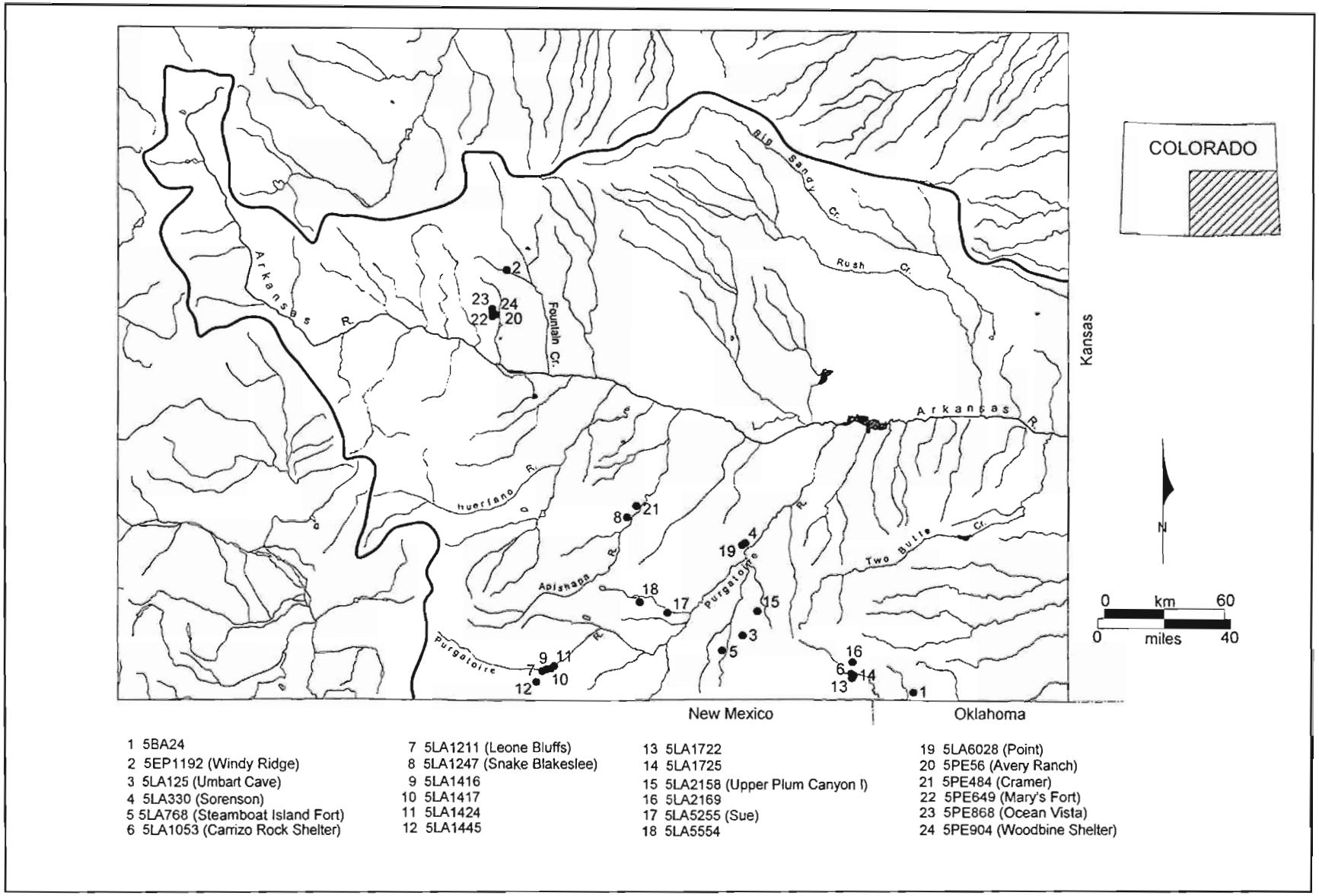

Figure 7-2. Map of Arkansas River context area showing locations of selected Diversification period sites.

are situated farther west along the upper Purgatoire River. Together, these sites are believed to represent the central or core regions of Diversification period population aggregation (Andrefsky 1990; Campbell 1969a; Gunnerson 1989; Kalasz 1988, 1989, 1990; Mitchell 1997; Reed and Horn 1995; Rhodes 1984; Wood and Bair 1980). Campbell (1969a:336) notes that many stone enclosure sites on the Chaquaqua Plateau cover at least an acre and that one in particular, 5LA977, covers 35 acres; these sites typically consist of five to six rooms, but 37 rooms were identified at 5LA977. Gunnerson (1989) mapped seven contiguous rooms at the Snake Blakeslee site, and three large rooms interconnected by "breezeways" or "alleys" at the Cramer site. The size of some of these rooms is striking; the largest room at the Cramer site is 7.5 m wide. These room size data also imply greater population aggregation. Site 5LA1416 and the Leone Bluffs site along the upper Purgatoire River both exhibit six multiroom structures, the number of associated rooms ranging from two to 15 (Mitchell 1997:97).

The geographical boundaries of the Diversification period phenomenon are not firmly established, but both the Apishapa phase and the Sopris phase are widespread. The Apishapa phase is more prevalent across the context area but Sopris phase occupations may be extensive in northeastern New Mexico. The northern extent of Diversification period population aggregation is evidenced by Apishapa phase sites situated along Turkey Creek south of Colorado Springs (Ireland 1968; Kalasz et al. 1993; Watts 1971; Van Ness et al. 1990; Zier and Kalasz 1985; Zier et al. 1988). The southernmost representation involves both the Sopris phase settlements found in the Park Plateau region south of Trinidad, and Apishapa phase "forts" in northeastern New Mexico; the latter are exemplified by an 18-room settlement in the upper Corrumpa River drainage basin (Biella and Dorshow 1997a; Mitchell 1997; Winter 1988; Wood and Bair 1980). Apishapa phase sites extend from just south of Colorado Springs into northeastern New Mexico; Sopris phase settlements are known on the Park Plateau in southeastern Colorado and northeastern New Mexico (Mitchell 1997:94-95).

Available evidence suggests that the settlements in the core area, particularly those of the upper and lower Purgatoire River, represent the greatest levels of prehistoric population aggregation in the Arkansas River Basin. The eastern and western boundaries of the multiroom, multistructure phenomenon are not well established. However, Carrizo Ranches and Apishapa Highlands investigations indicate that Diversification period sites near the eastern and western edges of the context area do not approach those of the Purgatoire and Apishapa River core area in terms of overall size and numbers of structures (Lutz and Hunt 1979; Nowak and Kantner 1990). Similarly, the northern and southern extensions of Diversification period population do not exhibit the level of settlement suggested by the architectural sites in the core area. This statement is tentatively presented with full recognition that large areal expanses within the context area are poorly known archaeologically.

Technology

Unlike the preceding Developmental period, no new technologies were introduced during the Diversification period. In fact, technological trends that are prevalent in earlier assemblages of lithic artifacts, ceramics, and bone tool/ornaments continue with minimal modification in the Diversification period. The most significant change involved ceramics, specifically an increase in the number of different wares. Southwestern or Puebloan pottery in particular becomes widely distributed throughout the context area, although nowhere is it abundant. Puebloan wares constitute a significant and well-represented component of Sopris phase ceramic assemblages, and are reported in lesser density and diversity at Apishapa phase sites across the context area. The local, cord-marked ceramic tradition remains predominant among Apishapa phase sites, and cord-marked pottery is associated in lesser quantities with Sopris phase occupations as well (Wood and Bair 1980). Of note is the Upper Republican trade ware recovered from the Ocean Vista site at

Fort Carson (Kalasz et al. 1993). Ocean Vista is also unusual in that 24 sherds representative of a single Southwestern corrugated vessel were recovered; corrugated pottery is rare among Diversification period sites.

Analyses of Diversification period lithic assemblages indicate a continuation of Developmental period production strategies. Ground stone assemblages are characterized by the same uniformity demonstrated by those of earlier periods in that, although formally patterned tools are known, the overall collections generally reflect an expedient approach toward manufacture. Settlements of the Sopris phase exhibit more formally patterned Southwestern-style trough metates and two-hand manos, albeit in comparatively low quantities (Mitchell 1997; Wood and Bair 1980). Overall, manos remain the most extensively modified and morphologically variable ground stone implement used at this time. Although some chipped stone analyses have been oriented toward formal tools (Gunnerson 1989; Ireland 1968; Watts 1971), other researchers have emphasized the importance of expedient flake tools as well as bifaces for Diversification period populations (Kalasz et al. 1993; Zier et al. 1988; Wood and Bair 1980). Continuing an Archaic stage tradition, chipped stone production strategies at Apishapa and Sopris phase settlements emphasize the manufacture of both minimally modified flake tools and highly patterned bifaces such as projectile points. Both Sopris and Apishapa phase flint knappers evidently preferred a casual or random method of flake removal from unstandardized cores (Kalasz et al. 1993; Wood and Bair 1980; Zier et al. 1988). Increased production of minimally modified flake tools and a corresponding decrease in formal tool (e.g., biface) manufacture has been proposed as correlating with increasing Late Prehistoric sedentism among sites of the North American temperate zone (Parry and Kelly 1987). Although Diversification period settlement in the context area unquestionably reflects increased sedentism, associated chipped stone technologies continue to emphasize production of bifaces as well as expedient flake tools. Biface percentages within several Diversification period assemblages have been shown to equal or exceed those of expedient flake tools (Kalasz et al. 1993; Wood and Bair 1980; Zier et al. 1988; Zier and Kalasz 1985).

The few rigorous debitage analyses undertaken for Diversification period assemblages indicate that tool finishing and refurbishment was emphasized among a variety of site types (Kalasz et al. 1993; Zier et al. 1988; Zier and Kalasz 1985). "Stone apparently arrived at sites either as finished tools which were subject to maintenance, or in unfinished yet portable condition, such as bifaces or small nodules. Depending on the task at hand, flakes produced from the latter items were used primarily with little or no further modification, or were fashioned into a variety of small, stemmed or unstemmed bifacial tools" (Kalasz et al. 1993:300). Evidently, raw materials were significantly reduced at specific sites, such as quarries.

While the foregoing discussion focuses on similarities among lithic artifacts of the Diversification period, there is a potentially important contrast between Sopris and Apishapa chipped stone tool assemblages. The lithic artifact most diagnostic of Apishapa phase occupation remains the small, triangular, side-notched or flange-stemmed projectile point generally termed Reed or Washita in the context area (Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Rhodes 1984; Watts 1971; Zier et al. 1988; Zier and Kalasz 1985). In contrast, the corner-notched forms typical of the preceding Developmental period are more common in Sopris phase settlements (Wood and Bair 1980:Table X). The current limited databases enable one to speculate that this trend may be related to differing game procurement strategies, i.e., the bison orientation of larger Apishapa phase sites versus the small game and deer orientation of Sopris phase settlements. The proposal that the flanged stem is a modification reflective of increased bison exploitation is worthy of further examination in context area studies (see also Anderson 1989a:234).

Bone tools and ornamentation become more prevalent in the shift from the Developmental to the Diversification period. Besides the awls and rabbit bone tubular beads typical of the general

Late Prehistoric adaptation, considerable morphological variability is seen among Apishapa and Sopris phase tools fashioned from large game long bones (Erdos 1998; Gunnerson 1989; Rhodes 1984; Wood and Bair 1980; Zier et al. 1988). Among the larger architectural sites of the Apishapa phase, this situation perhaps reflects the increased emphasis on bison processing. The associated waste provided abundant raw material for a wide variety of items including task-specific tools. Similarly, Sopris phase settlements were characterized by substantial faunal collections; deer rather than bison, however, were the preferred large mammal quarry.

Settlement and Subsistence Strategies

Site Type and Locational Variability

Architectural sites have traditionally received the greatest investigatory attention related to Diversification period settlement. Although the prominent architectural sites of the Apishapa and Sopris phases reflect important aspects of settlement, at some point archaeologists need to gain greater insight into the full range of morphological and functional site types. The previously discussed large-scale surveys of the PCMS, Fort Carson, and Picket Wire Canyonlands clearly indicate that considerable variability exists in site types and their spatial distribution during the Apishapa phase (Alexander et al. 1982; Andrefsky 1990; Jepson et al. 1992; Kalasz 1988; Loendorf and Loendorf 1999; Reed and Horn 1995; Van Ness et al. 1990; Zier et al. 1996a). Most recent investigators believe this variability reflects a semisedentary settlement pattern characterized by seasonal use of residential bases and specialized resource procurement encampments. This pattern is thus somewhat suggestive of Binford's (1980) collector strategy. Excavation of various site types at Carrizo Ranches, Fort Carson, the Chaquaqua Plateau, the PCMS, and the Picket Wire Canyonlands supports such a model, but there are many gaps in specific information sets because of the relative paucity of block excavations (Andrefsky et al. 1990; Campbell 1969a; Kalasz et al. 1993; Nowak and Kantner 1990, 1991; Reed and Horn 1995; Rhodes 1984). Currently, there is insufficient information to confirm which specific types of resource extraction or processing activities, or both, were accomplished at the smaller Apishapa phase nonarchitectural sites.

The full range of Sopris phase settlement is even less understood than that of the Apishapa phase. Surveys completed in the Trinidad district attest to the variability in site type and location (Gleichman 1983; Lutz and Hunt 1979; McKibben et al. 1997; Tucker 1983). As with the Apishapa phase, smaller nonarchitectural sites in significant densities are situated in the vicinity of the larger Sopris phase residential bases. However, ceramics indicative of Sopris phase settlement are rare among the nonarchitectural site sample. Further, radiocarbon or other absolute date associations are lacking because few of the nonarchitectural sites have been excavated (Indeck and Legard 1984).

Economy

Significant modification of the long-lived, hunter-gatherer strategy is seen during this period, especially with regard to evidence for increased sedentism. While the economic effects of purported climatic deterioration are currently not well understood, it is undeniable that the overall density and diversity of subsistence-related remains is greater during the Diversification period than in earlier times. Differing viewpoints pertaining to maize horticulture were presented in the section summarizing Late Prehistoric stage economy (this volume). Regardless of whether maize played a major or a minor role in Apishapa or Sopris phase subsistence, its presence certainly increases during the shift from the Developmental period to the Diversification period (Campbell 1969a; Ireland 1968; Kalasz et al. 1993; Mitchell 1997; Wood and Bair 1980; Zier et al. 1988). Nevertheless, a variety of wild plant remains and game persists as a primary element of

Diversification period subsistence. The most significant contrast between diets of the Sopris and Apishapa phases is manifested in the latter's greater focus on bison procurement, and the former's preference for leporids and deer (Gunnerson 1989; Kalasz et al. 1993; Ireland 1968; Mitchell 1997; Watts 1971; Wood and Bair 1980; Zier et al. 1988). However, it is emphasized that select Apishapa phase rockshelters such as Upper Plum Canyon Rock shelter I and Woodbine Shelter exhibit faunal assemblages comprised primarily of small mammals (Kalasz et al. 1993; Rhodes 1984).

Although cists and subfloor pits commonly occur at sites of the Developmental period, the Diversification period apparently witnesses increased food storage capabilities. Subfloor pits and cists continue, but additional storage facilities are believed to be represented by small aggregated rooms attached to larger structures. Such facilities are particularly prevalent at Sopris phase settlements (Wood and Bair 1980:Table IV), but increasing evidence suggests that they are also commonly associated with Apishapa phase occupations (Andrefsky et al. 1990:582; Campbell 1969a:229, 398; Ireland 1968:8,16; Kalasz 1988:84-85; Zier et al. 1988:76). The economic implications of increased storage are yet to be resolved. One may speculate as to whether these innovations enabled Diversification period populations to store the quantities of food necessary for a more sedentary existence. Kalasz (1988) suggests that efficiency in food storage techniques among hunter-gatherers facilitated semisedentism in areas strategically located with respect to a range of biotic and hydrological resources. On the other hand, elevated levels of horticulture may have led to expanded storage capacity and stimulated a greater degree of sedentism.

Architecture

Diversification period architecture is generally more complex, variable, and massive than that of the Developmental period. Sopris phase architecture is differentiated from that of the Apishapa phase on the basis of rectilinear walls, adobe or jacal construction, horizontal slab foundations, the presence of mortuary chambers, and formalized interior features such as mud-collared hearths (Mitchell 1997; Wood and Bair 1980). Apishapa phase architecture is found in rockshelter as well as open settings and is characterized by curved rock walls that are more likely to incorporate vertical slabs. So-called barrier walls are also common architectural attributes of this phase. In marked contrast to Sopris phase structures, human interments have not been found with Apishapa phase architecture. Artists' recreations of selected structures of the Apishapa phase and Sopris phase are provided in Figure 7-3.

Like their respective ceramic associations, Sopris phase architectural attributes may reflect Southwestern contacts; those of the Apishapa phase are apparently indicative of Plains Village influences. It is also apparent that Sopris and Apishapa architecture differs substantially from that of either the Southwest or Southern/Central Plains, and each is characterized by considerable morphological variability (Campbell 1969a; Ireland 1968; Kalasz 1988, 1989, 1990; Mitchell 1997; Watts 1971; Wood and Bair 1980; Zier et al. 1988). Neither exhibits a well-defined, standardized post pattern or house form, nor do context-area examples display ventilator shafts, deflectors, benches, or pilasters. Although Sopris and Apishapa architectural forms are distinct, there is some noteworthy overlap between the two in terms of morphological attributes. Both Apishapa and Sopris structures are characterized by highly variable floor areas that typically form shallow basins. The architecture of both phases exhibits wall extensions termed fences, alleys, or plazas (Campbell 1969a:224; Gunnerson 1989:Figure 2; Mitchell 1997:97). Adobe has not been identified in Apishapa phase structures, but daub and clay suggestive of jacal construction and prepared floors are relatively common (Gunnerson 1989:28; Ireland 1968; Kalasz et al. 1993; Zier et al. 1988). The Wallace site, one of the few Apishapa phase architectural sites subjected to extensive excavation, apparently included formally constructed interior floor features; none, however, appeared to be similar to the mud-collared hearths of the Sopris phase (Ireland 1968:14-

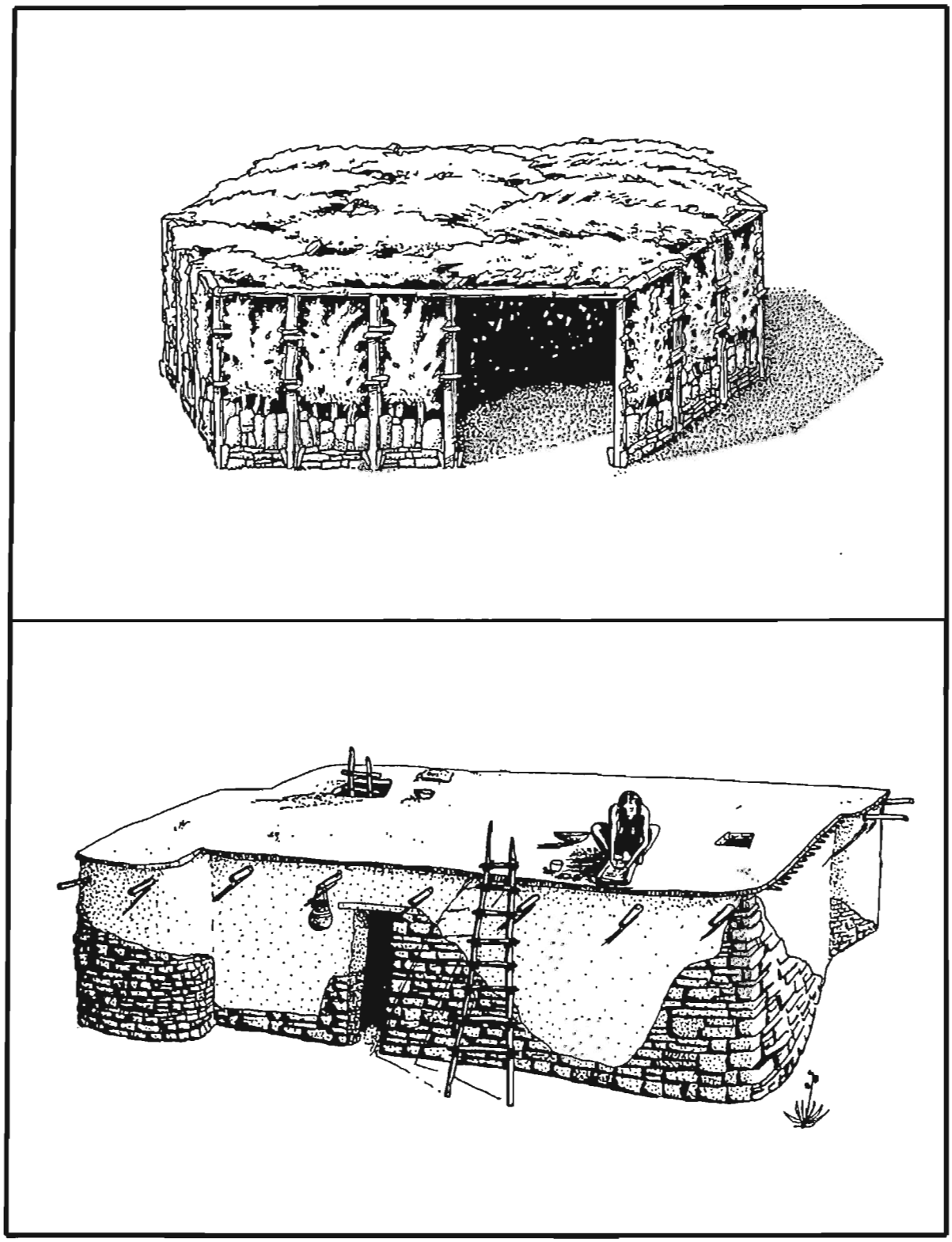

Figure 7-3. Artists' recreations of Apishapa phase architecture (top) and Sopris phase architecture (bottom). (Top drawing by Steven McMath, after Zier et al. 1988:Figure 40; bottom drawing by Bill Tate).

15). Horizontally coursed rock walls and rectilinear rooms are known at Apishapa phase settlements, particularly at the Snake Blakeslee site (Campbell 1969a:224, 237; Gunnerson 1989:69; Ireland 1968:89-90). Alternatively, some Sopris phase pit structures apparently display the circular design more typical of Apishapa phase sites (Wood and Bair 1980:Figures 15, 17, 19). In summary, the variability associated with Apishapa and Sopris sites is profound given the relatively scant and often poorly recorded excavation information associated with each. Additional, rigorous, block excavation of Sopris and Apishapa phase architectural sites is crucial for understanding this complex and important facet of settlement during theDiversification period.

Apishapa Phase

Introduction

Sites have traditionally been recognized as Apishapa phase in affiliation on the basis of unique and sometimes massive stone masonry architecture, often clustering in numbers suggestive of settlements or hamlets. Although data from larger architectural sites and rockshelters were the foundation for Withers' (1954) definition of the manifestation, Eighmy (1984:134) asserts that "since 1954, the concept of an Apishapa Focus or Phase has been consistently used and extended to include nearly all the material mentioned for Middle Ceramic Period in Southeast Colorado." Artifacts as well as faunal and botanical remains have been cited in suggesting that this phase was essentially a less sedentary form of the Plains Village pattern, a series of horticultural settlements common on the eastern Plains from North Dakota to Oklahoma and Texas (Lintz and Anderson 1989; Kalasz 1988). The Apishapa phase would thus constitute the extreme western extent of Plains Village settlement and, as such, demonstrate a greater preference for hunting and gathering than is described for cultures farther east. Perhaps for related reasons, Apishapa phase populations have been perceived as less fully integrated into the typical Plains Village pattern than, for example, the more sedentary populations of the Texas and Oklahoma panhandles (Lintz 1989).

Withers' (1954) original conception of the Apishapa focus was undoubtedly inspired by the "Indian stone enclosures" reported by Renaud in the 1930s and 1940s, and subsequent excavations of such architecture by Chase (Chase 1949; Lintz 1999; Renaud 1942a). These substantial ruins, including the Snake Blakeslee, Juan Baca, and Cramer sites, are located along the Apishapa River, a southern tributary of the Arkansas. Early investigators recognized similarities between the Colorado Apishapa settlements and southern Plains Village sites located along the Canadian River in the Texas panhandle (Campbell 1969a; Chase 1949, 1952; Lintz 1999; Withers 1954). Specifically, it was the Antelope Creek focus of the Panhandle aspect that elicited the most cause for comparison. For a time, the Apishapa focus was subsumed within the Panhandle aspect, and a phylogenetic relationship with the Antelope Creek focus was proposed that involved significant population movements between the two (Campbell 1969a). More recently, Lintz (1978, 1984, 1989) has questioned the application of such a taxonomy. In its place, Lintz (1984, 1986) defined the Upper Canark Regional Variant to dispel the ambiguities surrounding the Panhandle aspect and to clarify the relationships between the Antelope Creek and Apishapa phases (see Chapter 4, this volume). Most importantly, the Upper Canark Regional Variant emphasized local, in situ phase development characterized by distinct geographical boundaries and "relative internal homogeneity in technologies, subsistence patterns, and settlement patterns" (Zier et al. 1988:267).

Past and present perceptions of the Apishapa phase often remain tied to the larger architectural sites and rockshelters (Baugh 1994:277-278; Eighmy 1984:116-121; Gunnerson 1989; Lintz 1989:281; Rhodes 1984; Zier et al. 1988:24). In southeastern Colorado, Gunnerson (1989) separates the more substantial and purportedly later settlements of the Apishapa phase (e.g., Snake Blakeslee and Cramer sites) into the "Classic Apishapa" taxon. However, such a label

may be construed as a lingering remnant of the "type site" concept, an abstraction whose time has largely passed. Rather than archetypes, such sites are merely part of a rapidly growing body of evidence epitomizing the magnitude of Apishapa phase variability. Variation among these later plains-inspired architectural sites is seen as symptomatic of intricate and probably fluctuating adaptive processes during the Diversification period. Since the original single-paragraph definition of the Apishapa focus was published (Withers 1954), a vast bank of literature has been produced that elucidates the scope of prehistoric hunter-gatherer settlement-subsistence strategies. Research along these lines is particularly appropriate for contemporary inquiry of the Apishapa phase and suggests that a range of nonarchitectural as well as architectural sites must be included in the taxon (Bettinger 1991; Binford 1980, 1990; Campbell 1969a; Kelly 1995; Lintz 1989:281). Lintz (1989:271), citing Campbell (1969a:20, 393), notes that the three basic kinds of Apishapa sites consist of nonarchitectural surface encampments, rockshelters, and stone enclosures. Recent radiometric and artifactual data also indicate that it is reasonable to assume that a variety of ancillary sites support the larger settlements and provide at least the foundation for a broader meaning of the Apishapa phase. Difficulties arise in positing more profound interrelationships among Apishapa phase site types because archaeologists currently lack the comprehensive view that only rigorous excavation of diverse components can provide. The following information is sufficient only for deciphering the known breadth of Apishapa phase variability and exposing at least a few threads of affinity among the manifestation as a whole. Present deficiencies aside, future research emphasis should be placed on examining the Apishapa phase as a chronologically mutable, yet coherent, network of settlement loci rather than static, isolated horticultural settlements.

Chronology

Lintz's (1989:280) statement remains fitting concerning the Apishapa phase temporal span: "Chronological information about the Apishapa phase is hindered by the delineation of cultural attributes encompassing the phase and, until recently, by relatively few absolute dates." An attempt is made here to define more firmly the temporal range of the Apishapa phase by interpreting radiocarbon dates associated with the proposed hallmarks of the manifestation, i.e., architecture indicative of increased levels of sedentism and population aggregation, cord-marked ceramics, and/or small side-notched points. Selecting components that exhibit all or portions of these attributes requires a subjective level of assessment. Gunnerson (1989:12) proposed that the Apishapa phase should be narrowly defined until archaeologists understand more fully the attributes of the preceding Developmental period. He further asserted that sites assigned to the Apishapa phase should include only those with substantial artifact inventories. The term "substantial" may describe a wide range of assemblages, but it is assumed that Gunnerson's focus was on the larger architectural settlements. However, in recent years a wide range of site types with decidedly Apishapa phase qualities has been investigated that may, as discussed above, facilitate a broader definition of the phase. To achieve the desired goal of examining the Apishapa phase as a coherent network rather than as isolated horticultural settlements, a multiple-stage date selection process is presented. Initially, only the most obvious Apishapa phase components with associated absolute dates are selected. Additional radiocarbon-dated components that have some, but not all, of the typical Apishapa phase characteristics are subsequently added. The latter may represent temporary resource extraction loci and/or sites that received limited investigation. To attain some level of consistency in the sample, only radiocarbon dates believed by the respective investigators to be valid indicators of Apishapa phase occupation are utilized; dates thought to represent contaminated or old wood/heartwood samples are excluded. All of the selected radiocarbon dates are processed through a common calibration program, CALIB 3.03.3 (Stuiver and Riemer 1993).

A number of radiocarbon assays have been obtained recently from the large, open architectural sites for which the Apishapa phase is best known. Such information was not available to the author of the previous research context, who relied primarily on dates from rockshelters on the Chaquaqua Plateau and small architectural sites in the Carrizo Creek area for chronological control (Eighmy 1984:116-119). Calibrated radiocarbon ages from prominent architectural sites associated with abundant artifacts, including ceramics and side-notched Reed/Washita projectile points, are presented in Part A of Table 7-7. These dated components are from the Avery Ranch site, Mary's Fort, and Ocean Vista at Fort Carson (Zier et al. 1988; Zier and Kalasz 1985; Kalasz et al. 1993); Cramer site along the Apishapa River (Gunnerson 1989); site 5LA5554 at the PCMS (Andrefsky et al. 1990); and Steamboat Island Fort on the Chaquaqua Plateau (Campbell 1969a). Multiple radiocarbon ages were obtained from the Fort Carson and Apishapa River sites; earlier ages are excluded from the table because they are thought to represent old wood/heartwood problems or a distinct earlier component. Conversely, only one age each is associated with the PCMS and Chaquaqua Plateau examples.

Single calibrated radiocarbon ages from large, open, aggregated-room architectural sites that have received limited investigations are listed in Part B of Table 7-7; sparse artifact collections that do not include ceramics and/or side-notched projectile points are associated with these components. The Sorenson and Point sites are located in peninsular, "defensive" canyon settings along the lower Purgatoire River (Loendorf et al. 1996); three aggregated-room structures each encompassing between three and 25 rooms were identified at the Sorenson site and a minimum of seven rooms was recorded at the Point site (Loendorf et al. 1996:300-302). Darien's Fort is situated along the upper Dry Cimarron River drainage basin of northeastern New Mexico in a similar defensive setting; the site exhibits long barrier walls and a minimum of six discernible rooms (Winter 1988:36, Figure 4.5).

Part C of Table 7-7 lists calibrated radiocarbon ages from sites that may represent specialized types within the Apishapa phase settlement pattern. This sample is comprised of rockshelters and open architectural sites less substantial than those listed in parts A and B of Table 7-7. Though the artifact assemblages are generally smaller than those of the more prominent Apishapa phase sites, all of these sites are associated with side-notched Reed/Washita points and most have cord-marked ceramics. The Windy Ridge site and Woodbine Shelter are open-setting and rockshelter sites, respectively, at Fort Carson (Kalasz et al. 1993). Woodbine Shelter has a single structure within the dripline; Windy Ridge is nonarchitectural, but several hearths are present. Both are associated with side-notched Reed/Washita points and cord-marked ceramics. A number of stone enclosure and rockshelter components in the Carrizo Ranches area are appropriate for this analysis; summaries of these sites may be found in two volumes by Nowak and Kantner (1990, 1991). Radiocarbon-dated, open stone enclosures with associated side-notched Reed/Washita projectile points were excavated at 5LA2169, 5LA1725, and 5LA1722. Cord-marked ceramics were found only at 5LA1722, and the few pieces were not directly associated with the dated enclosure. Both ceramics and side-notched Reed points were recovered from radiocarbon-dated rockshelter contexts at 5BA24 and Carrizo Rock shelter. A radiocarbon date from maize in Level 1B at Medina Rock shelter on the Chaquaqua Plateau was presented in the previous research context (Eighmy 1984:116). Although the date is an important indicator of general Diversification period occupation in the region, associations with Apishapa phase materials are minimal. No ceramics were recovered and the single, side-notched Washita projectile point was collected from the level above that producing the age assessment (Campbell 1969a:133, 145). Similarly, the radiocarbon dates recovered from Pyeatt Rock shelter on the Chaquaqua Plateau and Gimme Shelter at the PCMS were not associated with either ceramics or small side-notched points (Andrefsky et al. 1990; Campbell 1969a). In fact, 14 small, corner-notched Scallorn points, a hallmark of the preceding Developmental period, were associated with the Pyeatt Rock shelter date (Campbell 1969a:Table 10). These dates are therefore excluded from

Table 7-7. However, radiocarbon dates strongly associated with Reed/Washita points are available from the nearby Upper Plum Canyon Rock shelter I and Umbart Cave (Campbell 1969a; Rhodes 1984). Cord-marked ceramics were also found at Umbart Cave. Finally, a Reed/Washita point was recovered in proximity to a radiocarbon-dated hearth at the Sue site on the PCMS (Andrefsky et al. 1990).

Table 7-7. Radiocarbon Dates from Apishapa Phase Sites.

SiteName/ Number	Raw Radiocarbon Age (B.P.)	Calibrated Age		Two-sigma Calibrated Age Ranges from Probability Distributions (Method A)	
		A.D./B.C.	B.P.	A.D./B.C.	B.P.
Part A					
Ocean Vista	940 ± 70	A.D. 1046, 1097, 1115, 1144, 1153	904, 853, 835, 806, 797	A.D. 983-1256	967-694
Ocean Vista	890 ± 50	A.D. 1168	782	A.D. 1025-1276	925-674
Avery Ranch	790 ± 70	A.D. 1263	687	A.D. 1051-1373	899-577
Steamboat Island Fort	775 ± 85	A.D. 1276	674	A.D. 1043-1394	907-556
Avery Ranch	740 ± 60	A.D. 1284	666	A.D. 1213-1391	737-559
Avery Ranch	730 ± 90	A.D. 1286	664	A.D. 1162-1408	788-542
Avery Ranch	680 ± 70	A.D. 1298	652	A.D. 1229-1411	721-539
Avery Ranch	670 ± 80	A.D. 1300	650	A.D. 1225-1427	725-523
Cramer	660 ± 60	A.D. 1302	648	A.D. 1269-1411	681-539
Avery Ranch	640 ± 100	A.D. 1307, 1360, 1379	643, 590, 571	A.D. 1221-1446	729-504
5LA5554	570 ± 60	A.D. 1403	547	A.D. 1295-1444	655-506
Mary's Fort	560 ± 70	A.D. 1405	545	A.D. 1292-1455	658-495
Cramer	540 ± 90	A.D. 1410	540	A.D. 1288-1616	662-334
Part B					
Point	1030 ± 90	A.D. 1014	936	A.D. 820-1218	1130-732
Darien's Fort	1010 ± 70	A.D. 1020	930	A.D. 890-1203	1060-747
Sorenson	930 ± 50	A.D. 1052, 1085, 1121, 1139, 1156	898, 865, 829, 811, 794	A.D. 1013-1226	937-724

SiteName/ Number	Raw Radiocarbon Age (B.P.)	Calibrated Age		Two-sigma Calibrated Age Ranges from Probability Distributions (Method A)	
		A.D./B.C.	B.P.	A.D./B.C.	B.P.
Part C					
Windy Ridge	1080 ± 70	A.D. 984	966	A.D. 789-1153	1161-797
Upper Plum Canyon I	1050 ± 80	A.D. 1005	945	A.D. 819-1168	1131-782
5LA2169	960 ± 60	A.D. 1037	913	A.D. 983-1222	967-728
Woodbine Shelter	880 ± 60	A.D. 1176	774	A.D. 1022-1281	928-669
5LA1722	850 ± 50	A.D. 1218	732	A.D. 1041-1283	909-667
Windy Ridge	840 ± 70	A.D. 1222	728	A.D. 1028-1293	922-657
Sue	720 ± 70	A.D. 1288	662	A.D. 1213-1401	737-549
5LA2169	695 ± 90	A.D. 1294	656	A.D. 1182-1424	768-526
5LA1725	630 ± 50	A.D. 1310, 1353, 1385	640, 597, 565	A.D. 1285-1417	665-533
Carrizo Rock shelter	600 ± 55	A.D. 1328, 1333, 1395	622, 617, 555	A.D. 1290-1434	660-516
5BA24	600 ± 150	A.D. 1328, 1333, 1395	622, 617, 555	A.D. 1165-1641	785-309
Umbart Cave	590 ± 110	A.D. 1398	552	A.D. 1239-1611	711-339
Upper Plum Canyon I	570 ± 50	A.D. 1403	547	A.D. 1300-1439	650-511

The data presented in Table 7-7 indicate considerable temporal overlap among the three groups of assays. Viewing the earliest two-sigma extremes among dates from different regions, e.g., Darien's Fort, Point, and Ocean Vista, these data suggest that the aggregated room phenomenon typically associated with the Apishapa phase was widespread by roughly A.D. 900-1000. Considerably more radiocarbon data show that larger architectural sites with substantial and diverse assemblages, e.g., Cramer, Avery Ranch, Mary's Fort, and Steamboat Island Fort, were established later, ca. A.D. 1150-1250. The two-sigma extremes of the latest age assessments suggest that the aggregated room settlements extended to ca. A.D. 1500. Given the limited amount of absolute age data and the vagaries of the radiocarbon method, the temporal range of A.D. 1050-1450 currently seems reasonable for the Apishapa phase. The smaller, possibly more specialized sites have age assessments distributed throughout the temporal range of the Apishapa phase. Woodbine Shelter, Windy Ridge, and Ocean Vista, three neighboring Fort Carson sites, have age assessments that closely approximate one another. These data suggest that functionally different sites were included within a common Apishapa phase settlement pattern. Furthermore, three age assessments that nearly match are associated with large architectural sites extending from the northernmost extent of Apishapa phase settlement (Mary's Fort), through the area south of the Arkansas River (Cramer), to the Purgatoire River region (5LA5554). There is thus at least

the suggestion of a contemporaneous network of large residential bases distributed over a wide area.

Population Dynamics

Interregional Contacts. Similarities in settlement-subsistence strategy and artifact classes, particularly ceramics, suggest a connection between Apishapa and Plains Village populations east of the context area (Zier et al. 1988:267). Campbell (1969a:500-510) proposed that a widespread thirteenth century drought drove Apishapa phase populations southeast to found villages of the Antelope Creek phase. Lintz (1978), however, convincingly refuted the Apishapa-to-Antelope Creek developmental sequence. The author demonstrated through analysis of architecture and available radiocarbon dates that the two phases were more or less contemporaneous and highly dissimilar with regard to house construction. The respective Apishapa and Antelope Creek populations are therefore believed to have had unique local origins and developmental sequences. The Apishapa phase developed in situ from a long-lived indigenous hunter-gatherer population that gradually–probably over the span of several centuries–adopted an increasingly sedentary lifestyle.

The view of Apishapa phase isolation advanced by Lintz (1989:284-286) is not entirely supported by currently available data. As is discussed below, ceramics that are unquestionably trade wares are reported at several Apishapa phase sites. Further, there is considerable variability among cord-marked ceramics, and in most cases it is not known which are locally manufactured and which are exotic. Collared rims reminiscent of Upper Republican forms, for example, were recovered from both the Cramer and Avery Ranch sites (Gunnerson 1989:40; Kalasz et al. 1993:102-103). Shell ornamentation is a common occurrence among Apishapa phase sites, but these materials are generally recovered in low numbers, and species identification is spotty due to their often fragmentary condition (Campbell 1969a:89; Ireland 1968; Nowak and Kantner 1991:157; Rhodes 1984). Freshwater mussels are most often recovered but *Olivella* shell traded from the gulf regions is reported from the Chaquaqua Plateau, Kenton Caves in the Oklahoma panhandle, and the Beacon Hill Burial near Pueblo (Campbell 1969a:89; Black et al. 1991; Simpson 1976). Chipped stone of Alibates dolomite, presumably quarried in the Texas panhandle region, is reported in relatively low quantities on the Chaquaqua Plateau and Carrizo Creek areas, at the PCMS, and along the Apishapa River (Andrefsky 1990; Campbell 1969a; Gunnerson 1989; Nowak and Kantner 1990, 1991; Rhodes 1984). Obsidian is consistently reported in low quantities but only minimal sourcing of context area samples has been undertaken. A single flake from site 5LA3570 was sourced to Polvadera Peak in the Jemez Mountains of northern New Mexico (Charles et al. 1996:7.31); a hydration date of A.D. 1281 ± 49 was obtained for the sample. This meager information tends to support previous speculation that obsidian was traded from northern New Mexico sources (Campbell 1969a; Zier and Kalasz 1985; Zier et al. 1988).

Although Apishapa phase architecture is extremely variable and such features have only rarely been fully excavated, a few specific examples exhibit Plains Village attributes (see Architecture discussion, below). Most notable are the bison bone shim used for a post support at the Avery Ranch site and the four roof posts forming a square around a central hearth within Room A at the Cramer site (Gunnerson 1989; Zier et al. 1988). Traits such as side-notched points and grit-tempered, cord-marked pottery are well documented indicators of Apishapa-Plains Village interaction. Further, some of the more formalized bone tools, particularly the so-called spatulate tools from the Avery Ranch and Cramer sites, have a decidedly Plains Village quality (Zier et al. 1988:261; Gunnerson 1989).

In sum, current data largely support Lintz' assessment of the Apishapa phase as relatively isolated from Plains Village and Southwestern Pueblo influence. However, certain types of

counter evidence, although sparse, appear with sufficient regularity that one cannot entirely dismiss the notion of significant interregional interaction. Furthermore, the scarcity of such evidence may simply reflect the dispersed, semisedentary nature of Apishapa phase settlement. Simply put, it was probably much easier to accumulate trade goods at centralized residential locations occupied year-round than at the seasonal Apishapa phase habitations.

Population Aggregation and Community Organization. Apishapa phase architectural sites, or "villages," have been cited as evidence of a widespread population increase during the Diversification period (Campbell 1969a). However, greater population aggregation at specific sites rather than higher overall numbers may be a reasonable explanation for this phenomenon. Alternatively, increased site visibility due to substantial above-ground architecture is a possible factor in the apparent ubiquity of Apishapa phase components.

Furthermore, the proposition that Apishapa phase architectural sites represent true villages defined by multiple households forming a community social structure is open to question. On the one hand, Campbell (1969a:398) notes that "villages are large enough to contain units of lineage or band size, and because of the clustering of enclosure sites at particular locales there is a hint of intervillage cooperation that may have given rise to tribal units." The purportedly increased populations associated with Apishapa phase villages were believed to be the result of greater reliance on cultivated plants, e.g., maize (Campbell 1969a:398). Indeed, the potential for a level of sedentism approaching that of the Plains Village horticultural settlements was inferred: "It is possible that the larger villages may have been occupied year-round by some inhabitants, but it is unlikely that villages were occupied continuously for more than a few generations" (Campbell 1969a:393). Alternatively, Lintz (1989:284-285) argued that there was little evidence to support such claims: "The clustering of enclosure sites which has been thought to underlie village cooperation assumes site contemporaneity which has not been demonstrated, and the cultigens are believed to have contributed a minimal, albeit important, supplement to a foraging diet .... In contrast, the absence of grave goods, the random arrangement of structures at sites, the lack of apparent specialized structures, suggests that the Apishapa had little to no apparent status differentiation and little overall community organization..."

Further resolution of this matter, as is often the case with Apishapa phase research, must await additional large-scale excavation of architectural sites. Although Lintz's arguments remain valid, past and more recent data may be used to support partially Campbell's assertions of higher levels of social organization. The vagaries of radiocarbon dating, including the heartwood/old wood factors, restrict more precise temporal delineations of occupation. However, the plethora of overlapping radiocarbon dates associated with Apishapa phase architectural sites clustering along Turkey Creek at Fort Carson is highly suggestive of contemporaneity (see Appendix A, this volume; Kalasz et al. 1993; Zier and Kalasz 1985; Zier et al. 1988). Further support of architectural site contemporaneity is provided by cross-dating Cramer site absolute dates with Southwestern ceramics recovered from Snake Blakeslee (Gunnerson 1989). Both are part of a series of sites located along the Apishapa River south of its confluence with the Arkansas River. Overall, the number of radiocarbon assays from Apishapa phase sites in the context area is rapidly approaching the 92 figure that Lintz (1989) cites as evidence of Antelope Creek phase village contemporaneity. More rigorous examination of structure and room contemporaneity probably requires dendrochronological data that are currently not available.

The manner in which grave goods, status differentiation, and social organization are interrelated among Apishapa phase occupations remains problematic. Black (1997:32) notes that "...the use of mortuary data in the study of social ranking is fraught with difficulties (e.g., Trinkaus 1995:54-55)." Mortuary chambers have not, as yet, been discovered among Apishapa phase sites, and graves that are unquestionably associated are lacking. However, human interments dating to

the preceding Developmental period are well known along the Front Range and many are associated with grave goods (Black et al. 1991; Black 1997; Buckles et al. 1963; Jepson and Hand 1999). There is thus a well-established tradition in the region of human interments with grave goods, and this tradition likely continued into the Apishapa phase. Furthermore, a burial with shell disk beads was situated in proximity to a possibly Apishapa phase structure at 5HF1171 near Walsenburg (Black 1997:16). Finally, burials with grave goods are reported from the Kenton Caves, but cultural assignment of these materials remains tenuous (Lintz and Zabawa 1984).

The "random arrangement of structures at sites, and the lack of apparent specialized structures" is cited by Lintz (1989:284-285) as additional evidence of the lack of village-level social organization among Apishapa phase populations. It seems apparent strictly on the basis of the massive walls associated with the Snake Blakeslee and Cramer sites that some degree of communal social organization was necessary for their construction (Gunnerson 1989:Figures 3 and 15). Gunnerson (1989:130) suggests that the Cramer structures represent a contemporaneous architectural complex. The overall regularity of the wall construction, the number of rooms sharing walls, and rooms connected by "fences or alleys" tend to support Gunnerson's hypothesis. Recent investigations at Avery Ranch emphasized the spatial distribution of cultural debris and features for discerning a possible relationship between site plan and social organization (Zier et al. 1988:265). Data provided by earlier DU excavations were incorporated with the later excavations in an attempt to gain a more complete understanding of overall site structure. The following interpretation is weakened, however, by the assumption of room contemporaneity established by radiocarbon rather dendrochronological data. Figure 7-4 is a plan view of the Avery Ranch site features discussed in the narrative presented herein:

> The Avery Ranch site displays a symmetry of architectural unit layout and activity area location that may be more than accidental. This symmetry is striking if one accepts the interpretation of Structure 1 as a communal, walled multifunctional activity area and Structure 2 and DU Features 1-2 as residential units. A midline bisecting the site into northern and southern halves may be drawn eastward from the projection of the Turkey Canyon rim, through Structure 1 and the DU Features 3-4-5 activity area. Activity loci along this axis are functionally diverse and almost certainly communal. Architectural data suggest that an entryway in the Structure 1 wall opened eastward along the axis. To the north of the midline and lying along the southwest/northeast-trending canyon rim is one residential unit, Structure 2, with a south wall entryway facing inward toward the central site area. To the opposite (south) side and located along the northwest/southeast-trending segment of rim a similar distance from the midline is the second residential locality, DU Features 1-2. Whether this architectural unit featured an inward-facing north entryway is unknown. The geographical site center is approximated by the location of the major bison processing area, DU Features 3-4-5. Smaller activity areas represented by hearths of various sizes and configurations are scattered around the eastern edge of the site, to the east of architectural and major activity zones. This layout suggests strongly the presence of two nuclear or extended family units, spatially segregated for residential purposes but sharing two work areas. One area is tied directly to animal processing, while the second is generalized and multifunctional. The latter area, Structure 1, may be regarded as the focus of communal activities at the site. The possibility that family groups not residing at the Avery Ranch site also participated in bison killing and butchering must also be acknowledged, considering the massive quantities of faunal remains at the site [Zier et al. 1988:265].

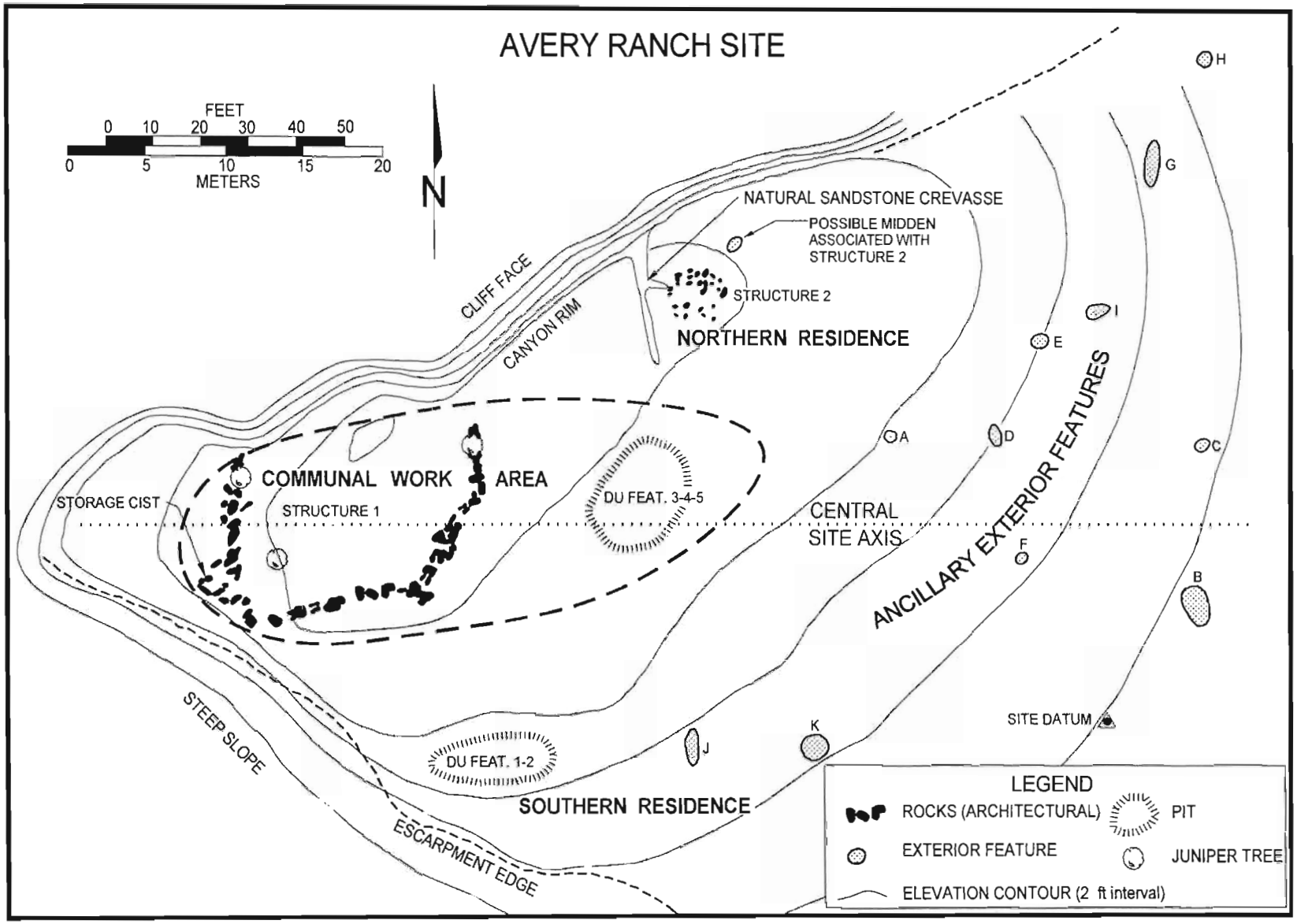

Figure 7-4. Plan view of Avery Ranch site showing relative locations of residential and communal areas (modified from Zier et al. 1988:Figure 10).

The latter statement is supported somewhat by the proximity of other Apishapa phase architectural sites along Turkey Creek, specifically Mary's Fort and Ocean Vista, which have radiocarbon ages similar to those of the Avery Ranch site. Mary's Fort is located within a mile Avery Ranch to the south, and Ocean Vista within a mile to the north (Kalasz et al. 1993; Zier and Kalasz 1985; Zier et al. 1988).

Further tentative evidence of the nonrandom arrangement of architectural sites is provided in the recent survey of Picket Wire Canyonlands (Reed and Horn 1995:106-110). Although those authors acknowledge that site contemporaneity cannot be confirmed with survey data, the regular and predictable patterning of "complex" and "simple" habitation sites along the Purgatoire River is believed to be due to social factors as expressed by central place theory (Flannery 1976, cited in Reed and Horn 1995:106-107). "We can conclude that, in general, the expected linear settlement pattern occurs along the Purgatoire River, and that central place principles hold true with regard to Complex Habitation Sites" (Reed and Horn 1995:110). However, the investigators also found that the distribution of artifacts and features within architectural sites exhibited little or no evidence of spatial patterning. These data "may indicate either liberal cultural norms regarding the distribution of major site activities or may be due to methods of analysis" (Reed and Horn 1995:110).

In sum, the arguments of Lintz and Campbell concerning the Apishapa phase "village" concept and social organization have their merits and drawbacks. The term "village" is not an appropriate descriptor of Apishapa architectural sites if it is meant to connote sedentary horticultural communities. However, the evidence presented above suggests that Apishapa phase settlement was characterized by considerable social organization despite a semisedentary lifestyle.

Abandonment. Warfare, drought, and concomitant food stress have all been offered as possible factors in the dispersal of Apishapa phase populations that evidently began in the A.D. fourteenth century (Campbell 1969a:491; Lintz 1989). Interdisciplinary studies indicate that the so-called Great Drought of the late thirteenth century Southwest also affected the Southern Plains (Hall 1982; Lintz 1984; Schuldenrein 1985). Schuldenrein (1985:226) asserts that, "the inescapable conclusion is that the middle to late Holocene alluvial events at the Fort Carson - Pinon Canyon Maneuver Site bear closer affinity to developments in the arid Southwest and Southern Plains than they do to Western or Central Plains." The implication of such conditions for Apishapa populations is presumed to be significant in light of the demographic upheaval posited for roughly contemporaneous Southwestern groups. Based upon studies of prehistoric Puebloans, Zier et al. (1988) suggest that populations tend to aggregate in times of stress. The level of aggregation seen among the more substantial architectural sites may reflect increased competition for fewer resources during drought-related adversity of the late Diversification period. "As sedentism develops, pressure on specific resource-rich areas grows. Environmental deterioration may critically reduce the carrying capacity of those areas, triggering drastic demographic response. The hypothetical trend toward greater population integration suggests that larger sites and site complexes date to the latter portion of the Middle Ceramic (Apishapa) period, a notion that is largely untested through chronometric dating on an area-wide basis" (Zier et al. 1988:269). Lintz (1989:285-286) suggests that the relative isolation of Apishapa phase groups and their failure to develop external trade and/or alliance networks led in part to their collapse. Goods obtained through such alliances may have "expanded their resource capabilities" and buffered the worst effects of local drought conditions and Athapaskan incursion (Lintz 1986:19-20).

The so-called defensive nature of many Apishapa phase settlement locations may reflect the presence of warring factions in the context area. However, the relationships among warfare, drought, and the fourteenth century population dispersal are currently unresolved. Further, there is little or no evidence to indicate if the purported strife was strictly intraregional, or if it reflects the

incursion of external groups such as northern Athapaskans. Winter (1988:77) believes the pervasiveness of historic and protohistoric warfare in the Dry Cimarron River valley has its antecedent among prehistoric populations, specifically as reflected in the region's Apishapa "forts." Interestingly, Winter (1988) believes physiography to have played a major role in the persistence of this conflict. Access to the rich and diverse canyon resources is thought to constitute the primary reason for dispute. However, there is no artifactual or other data to support the notion that these settings were in fact defensive in nature; they would be effective in the event of short-term raids but would be less than ideal for long-term sieges. It is proposed here that at least some of these sites that appear defensive may have constituted either sacred precincts or elite residences.

Current perception of what became of Apishapa phase groups following their abandonment of the region lies largely in the realm of informed speculation. The Caddoan connection cited by Gunnerson (1989:13), as based on the research of Hughes (1974), is presently the most popular supposition. "Given the disruptive droughts in late prehistoric times, I suggest that the Arikara, Pawnee and Wichita tribes all received increments of the Apishapa people. In fact, the Pawnee have a tradition, collected before 1889, that their ancestors came from the southwest where they lived in stone houses (Grinnell 1961:224). Could these include the stone slab structures of the Apishapa?" (Gunnerson 1989:13). Schlesier (1994:356-359) suggests that the Apishapa, along with populations of the Antelope Creek phase and Buried City complex, were driven east by Lipan Apaches sometime shortly after A.D. 1300. The author proposes that their descendants were the Teya groups encountered by the Coronado expedition in 1541 (Schlesier 1994:357-358). The Teya were Caddoan buffalo hunters whose camps were located "around the northeastern edge of the Texas panhandle and below the North Canadian River in western Oklahoma" (Schlesier 1994:358). The hypotheses of Gunnerson and Schlesier have yet to be tested adequately with archaeological data.

Technology

Apishapa phase technological attributes in many respects compare favorably with those of sites of the Plains Village pattern to the east. Although Plains Village implements such as bison scapula hoes and alternately beveled knives are absent or relatively rare occurrences at Apishapa phase sites, other characteristic attributes such as the production of cord-marked ceramics, the use of a variety of patterned bone tools (e.g., spatulate tools and bone wrenches), and the manufacture of small, side-notched projectile points, are typical of both manifestations. Lintz (1984:51) suggests that Apishapa phase tool assemblages, particularly chipped stone, are more generalized than those of Plains Village settlements to the east. Antelope Creek assemblages are characterized by a greater percentage of highly patterned tools (e.g., the bison scapula hoe and diamond beveled knives) believed used for specialized functions (Lintz 1989:279). Zier et al. (1988:268) suggest that this dichotomy may underscore fundamental differences between hunter-gatherer and horticultural subsistence strategies. However, it is emphasized that, with few exceptions, the relationships between specific tool forms and adaptive strategies have not been examined to the extent that any overall behavioral trends can be assumed. Other than the propensity for bison scapula hoes, two-hand manos, and trough metates to be associated with horticultural occupations, ethnographic and archaeological data indicate that highly patterned tools do not necessarily equate with specialized tasks or increased sedentism (Parry and Kelly 1987; White and Thomas 1972).

Ceramic assemblages recovered from Apishapa phase sites range from remarkably uniform to highly variable. Hummer (1989:371) notes that ceramic diversity of the Diversification period in the PCMS "...may be due to the intermediate location of the study area between Southwest and Southern Plains and Central plains groups engaged in active trade relationships." Although trade ware quantities are minuscule in comparison with those of nearby Sopris phase

components, their presence is becoming increasingly evident among Apishapa phase sites across the context area. Trade ware is known primarily from ancestral Puebloans, Plains Village manifestations, and possibly, the Sopris phase hamlets. Differentiation between locally and nonlocally manufactured pottery remains a problem, especially among the cord-marked pottery styles that are predominant at Apishapa phase sites. Cord-marked ceramics have been assessed as Borger or Stamper types based on subjectively determined similarities with southern Plains Village styles, particularly those of the Antelope Creek phase (Campbell 1969a:113-117; Eighmy 1984:116-117; Simpson 1976:155-156). Recent analysts have resisted the Borger or Stamper Cordmarked affiliation. For example, none of the PCMS, Fort Carson, Cramer, or Snake Blakeslee cord-marked ceramics are described as Borger or Stamper (Gunnerson 1989; Hummer 1989; Jepson et al. 1992; Kalasz et al. 1993; Van Ness et al. 1990; Zier and Kalasz 1985; Zier et al. 1988). Hummer (1989:330-331), citing Christopher Lintz (personal communication 1985), notes that PCMS Cordmarked Category 4 specimens exhibit Plains Village attributes but they do not resemble ceramics of the Antelope Creek phase: "...even though diagonal punctated rims and quartz temper are characteristic of Borger Cordmarked pottery, the paste texture and cordmarking patterns of Cordmarked Category 4 sherds are dissimilar." Instead, specimens of this category were believed to most closely resemble generalized Upper Republican wares without collared rims, particularly the Cambridge Tool-Impressed Lip Variety (Hummer 1989:330-331). The collared rims and surface treatment (polish) indicative of Upper Republican styles such as Frontier ware were also noted on cord-marked specimens from the Avery Ranch and Ocean Vista sites at Fort Carson (Kalasz et al. 1993:102-103; Watts 1971:88; Zier and Kalasz 1985:169). This pottery was thought to be a trade item.

Although Plains Village stylistic influences such as cord marking are prevalent, questions regarding local and nonlocal manufacture for the most part await petrographic and source element analysis (Hummer 1989). However, such analyses undertaken for ceramics of the Developmental period in the South Platte River Basin indicate that there is a well-established tradition of local manufacture of cord-marked pottery in the eastern plains and foothills of Colorado (Johnson and Parker 1992; Ellwood and Parker 1995). Given the demographic stability of the region prior to the Protohistoric period, it is reasonable to assume that this tradition continued in the Apishapa phase. Gunnerson (1989:71) has defined a local, cord-marked type, Munsell Gray, that is associated with a number of his "Classic Apishapa" sites. Comparison of Munsell Gray specimens with cord-marked categories from Fort Carson, Picket Wire Canyonlands, Carrizo Creek area, and the PCMS, have yet to be undertaken.

Puebloan ceramic types were recovered, albeit in low quantities, from Snake Blakeslee, Trinchera Cave, Wallace, Ocean Vista, Avery Ranch, Steamboat Island Fort, and Umbart Cave (Campbell 1969a; Gunnerson 1989; Ireland 1968:23; Kalasz et al. 1993; Simpson 1976; Zier et al. 1988). Black-on-white varieties identified as Rowe, Talpa, and Santa Fe were recovered from the Snake Blakeslee site (Gunnerson 1989; Ireland 1968:88). Curtis Schaafsma noted that all were local variations of a common theme that appeared in the Taos/Picuris, Pecos, Santa Fe, and Galisteo areas (among others) and may thus be easily confused with one another (Schaafsma 1989: Appendix III). A sherd identified as Santa Fe Black-on-white was also recovered from Trinchera Cave (Simpson 1976). Puebloan corrugated pottery was recovered from the Avery Ranch and Ocean Vista sites at Fort Carson (Ireland 1968; Kalasz et al. 1993:106-109), and at Umbart Cave and Steamboat Island Fort on the Chaquaqua Plateau (Campbell 1969a). An enigmatic, vertically indented sherd reminiscent of Southwestern corrugated utility wares of the Pueblo IV period was also recovered from the Avery Ranch site (Zier et al. 1988:187).

Cultural affiliations as well as attribute similarities among various categories of plain, incised, and polished wares associated with Apishapa phase components are difficult to ascertain. Although the difficulties may be ascribed in large part to small and fragmentary samples, some

confusion is introduced when attributes emphasized for these particular ware determinations differ according to analyst. For example, similarities among a number of attributes have suggested that Plain Ware categories from Fort Carson sites, including Avery Ranch and Ocean Vista, represent unmarked portions of cord-roughened vessels (Kalasz et al. 1993; Zier and Kalasz 1985:137; Zier et al. 1988:178). Alternatively, Plain Category 3 specimens from a later analysis in the same area are noted to resemble Polished Categories 2 and 3 from the PCMS (Hummer 1989; Sanders 1990; Van Ness et al. 1990:270). PCMS Polished Category 2 in turn includes smoothed over corrugated sherds most similar to the Polished Ware, Polished Blind-corrugated, and Polished Indented Blind-corrugated varieties recovered from Sopris phase occupations on the Park Plateau (Hummer 1989:340; Wood and Bair 1980:184-185). Reanalysis of the PCMS ceramic collection found that three previously unclassifiable sherds from the Apishapa phase architectural site 5LA5554 were also assignable to Polished Category 2 (Andrefsky et al. 1990:976-977; Sanders 1990:XI-32). Additionally, Polished Category 2 specimens are reported from Carrizo Creek sites such as Carrizo Rock shelter (Nowak and Kantner 1991:135). Incised Category 2 sherds from the Avery Ranch site were believed to be similar to the Polished Ware identified at Sopris phase sites but "paste texture, temper, and color characteristics ... are also within the ranges of those traits for Cord-marked Category 1, suggesting that the Incised Category 2 vessel was locally made" (Zier et al. 1988:185). However, the same analysis of Avery Ranch ceramics also included two categories of Polished Ware that were believed to represent a mixture of locally and nonlocally produced specimens (Zier et al. 1988:179-182). Polished, plain, and incised wares of the context area present a confusing yet intriguing classificatory problem that is potentially crucial for further elucidation of Apishapa, Sopris, and possibly Puebloan interaction. Past confusion could be alleviated by consistent application of attributes used in defining wares.

Apishapa phase lithic analyses vary greatly in orientation. This situation is not necessarily a drawback since the various analysts may have differing research goals. Together, the analyses suggest a number of recurring themes in Apishapa phase lithic technology. The following summary is somewhat biased in that it is derived from sites evidencing the most intensive occupation. This level of activity is associated with rockshelters such as Upper Plum Canyon Rock shelter I, Medina Rock shelter, 5BA24, and Carrizo Rock shelter, and larger architectural sites such as Avery Ranch, Ocean Vista, Cramer, and 5LA5554 (Andrefsky et al. 1990; Campbell 1969a; Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Nowak and Kantner 1991; Rhodes 1984; Watts 1971; Simpson 1976; Zier et al. 1988). Specialized lithic activities such as quarrying or procurement are poorly known for the Apishapa phase (Nowak and Kantner 1990:46-55). Studies of the larger samples associated with residential bases are therefore suitable only for limited interpretation of Apishapa phase lithic assemblages. These data indicate the predominance of a range of bifacial forms, expedient flake tools, slab metates, and cobble manos. Material types associated with Apishapa collections are extremely variable; this situation is believed to represent the procurement of stone from a variety of local sources as well as lower quantities acquired through trade (e.g., Alibates dolomite and obsidian). Cores (as in flaked cobbles and nodules) are generally reported in relatively low numbers and reflect unstandardized or random flake removal. Manuports are rare or absent, as are massive stone tools such as formalized choppers and/or grooved mauls. However, larger bifaces are sometimes noted as serving a chopper function, and cores or core tools, although few in number, often exhibit use wear. Similarly, many of the unifacial flake tools or scrapers reported are of sufficient heft to have been employed for heavy-duty tasks.

Chipped stone generally arrived at residences in a considerably reduced state or was exhaustively reduced by the time the occupants left the site. Debitage analysis further indicates an emphasis on late-stage tool manufacture and refurbishment. It is therefore currently assumed that initial stages of reduction occurred primarily at other site types such as quarries or the myriad sites in the context area recorded as "lithic scatters" (for specific examples see Jepson et al. 1992:244-

246; Nowak and Kantner 1990:46-58, 1991:110-111; Van Ness et al. 1990:314-353; Zier et al. 1996a:202-238). Bifacial blanks or simply large flakes may have been an end product of the reduction strategies carried out at procurement sites, but this notion needs to be explored further. Recent study has promoted the utility of unfinished bifaces as highly portable cores readily available for further reduction into more finely crafted implements and/or detachment of flakes suitable for expedient tools (Kelly 1988). It is therefore notable that Apishapa phase biface collections typically include a significant number of early/middle-stage unstemmed specimens (Gunnerson 1989:Figure 32, 47; Kalasz et al. 1993:Figure 8; Rhodes 1984:Figure 63; Watts 1971:Figure 5; Zier et al. 1988:Figures 45-46). Besides serving as cores, it is obvious from the bone-handled specimen recovered at Upper Plum Canyon Rock shelter I that these less elaborately flaked bifaces representing earlier stages of reduction also served effectively as tools (Butler 1985; Rhodes 1984:208-212).

As discussed above, flake tools typically constitute a major portion of Apishapa lithic collections, and all but the more formally patterned examples (e.g., end scrapers) have often been overlooked analytically. Recent studies have shown that context-area flake tool collections exhibit considerable variability in size, thinning, retouch, and use wear. Such variability suggests that these tools could be used for a wide range of tasks (Andrefsky 1990:IX-192–207; Kalasz et al. 1993). Further, it is obvious from the following statement that there is a fine line drawn between modified flakes and tools identified as various forms of scrapers. As Gunnerson (1989:47) notes, "Moreover, it was not until the stone specimens were closely examined in the laboratory that we discovered how many scrapers there were." As with bifaces, variability should be viewed among the nonbifacial flake tool class as a whole prior to distinguishing and providing additional analysis for the more formal varieties.

A number of more formalized lithic tool forms have been recovered from Apishapa phase sites. Although small, corner-notched Scallorn points continue to appear at Apishapa phase sites in low numbers, the small, side-notched Reed/Washita form is ubiquitous and often present in considerable quantities. Reed/Washita points are currently known as the lithic artifact most diagnostic of the Apishapa phase. Large, stemmed bifaces believed to have functioned as knives, drills, and possibly scraping implements have also been reported (Kalasz et al. 1993; Rhodes 1984; Zier et al. 1988). Formal, stemmed drills commonly occur, notably flange-stemmed or T-shaped varieties, but they are generally reported in low numbers. Similarly, more formal scrapers, spokeshaves, burins, and gravers are typically sparse. Perhaps the less formally patterned flake tools and bone or shell implements may have sufficed for many common domestic tasks. Diamond-beveled knives and so-called "guitar pick" scrapers typical of Plains Village assemblages to the east are absent or rarely reported (Gunnerson 1989:44).

The pervasiveness of so-called one-hand manos and flat slab or shallow basin metates is well documented among Apishapa ground stone collections. In one instance slabs were thin enough to have been classed as "palettes" (Rhodes 1984). Ground stone is typically of sandstone but a variety of quartzitic and granitic stream cobbles was also used. The expediency of manufacture often described for context-area ground stone in general is fitting for the Apishapa phase. The description of Cramer site manos is particularly apt: "One gets the impression that pieces of rock of approximately the desired shape and size were selected, and that little or no effort was expended in shaping" (Gunnerson 1989:50). Bifacial manos and metates were common but not predominant; the former also sometimes evidence ground or "keeled" edges (Bender 1990; Kalasz et al. 1993). Other types of modification, including pecking, battering, and flaking, are often present but vary greatly according to individual specimen. Battered end facets are common attributes of manos and suggest that ground stone implements may have been used for flint knapping (perhaps splitting cobbles), hide-working, bone marrow extraction, metate rejuvenation, and/or seed preparation (Rhodes 1984; Zier et al. 1988). In addition to manos and metates, shaft

abraders or smoothers very similar to the Antelope Creek phase example illustrated by Lintz (1989:Figure 3M) are also reported at some Apishapa sites (Gunnerson 1989; Rhodes 1984; Zier et al. 1988). Flat and basin bedrock grinding facets are well known at Apishapa phase sites in canyon settings. Stone pendants and slate gorgets are also possibly associated with the Apishapa phase (Andrefsky et al. 1990:Figure 20; Lintz and Zabawa 1984).

The Apishapa phase bone tool and ornament industry is best described by the large and diverse samples recovered from the Cramer, Snake Blakeslee, Upper Plum Canyon Rock shelter I, and Avery Ranch sites (Gunnerson 1989; Rhodes 1984; Watts 1971; Zier et al. 1988). These implements are sufficiently variable to have greatly supplemented the lithic industry, and indeed the two industries may have overlapped in terms of function, particularly with regard to tasks requiring perforation. Although the bison scapula hoes typical of Plains Village occupations have not been found at Apishapa phase sites, a number of other patterned bone tools and ornaments are associated. A great variety of tools is believed to have functioned as punches, awls, wrenches (also referred to as shaft straighteners), spatulas, hide grainers, scrapers, reamers, fleshers, polishers, flakers, paint spreaders, digging sticks, and knives. Also of note are the bone tool handles reported from Cramer, Snake Blakeslee, and Upper Plum Canyon Rock shelter I sites. A wide range of bone elements was used for tools, with large mammal ribs and long bones preferred. Bison bone was particularly evident among the Snake Blakeslee and Cramer site assemblages. Ornamental bone consists of disk and tube beads. For these items the bones of birds, small mammals (mainly leporids; metapodials and long bone elements), and medium mammals such as canids were preferred. The ends of the cut bone tubes are often ground and beveled, and exhibit considerable polish.

Other items believed to have been manufactured by Apishapa phase artisans include shell tools and ornaments (mostly of freshwater mussels), stone pipes and disk beads, juniper and plum seed beads, fire basins and drill bits, *Phragmites* "cigarettes," pigment stones, and a possible pendant fragment of turquoise from the Avery Ranch site; additional perishable items are known from a few unique rockshelters with possibly Apishapa phase affiliations (Campbell 1969a; Gunnerson 1989; Ireland 1968; Lintz and Zabawa 1984; Nowak and Kantner 1990, 1991; Rhodes 1984; Simpson 1976; Zier et al. 1988). A wealth of materials was recovered from Kenton Caves in the Oklahoma panhandle but cultural assignment of specific items is inhibited by the lack of excavation records and absolute dates. A summary of the Kenton Caves investigations, which occurred primarily in the 1920s and 1930s, is found in Lintz and Zabawa (1984). Those authors note that the later occupation of Kenton Caves may be affiliated with southeastern Colorado manifestations of the Diversification period. In particular, the proximity and similar environmental context of Campbell's Chaquaqua Plateau study area and the presence of cord-marked pottery and Reed/Washita points are suggestive of regional ties. It is also apparent that the Kenton Caves are of considerable antiquity and many of the perishable remains could be associated with pre-Apishapa occupation. Similarly, Trinchera Cave produced an abundant assemblage of perishable items but again, cultural assignment is restricted by disturbed, intermixed deposits and a lack of well-defined stratigraphic relationships and radiocarbon dated contexts (Simpson 1976). Alternatively, Upper Plum Canyon Rock shelter I, and to a lesser extent Medina Rock shelter, are characterized by more rigorously controlled excavations associated with radiocarbon dates (Campbell 1969a; Rhodes 1984). Because of better preservation, the rockshelters offer a more complete view of Apishapa phase material culture and economy (economic implications are addressed in a later section). Noteworthy perishable items include long bows, arrow shafts, basketry, woven grass or prairie dog skin bags, yucca and leather sandals, twined mats, cordage, knotted yucca, wooden needles, pegs, hairpins, rabbit fur blankets, and a feather bundle tied with yucca fiber. The skin and woven plant material bags were evidently used to carry or store maize and gourd seeds. Carrying straps were commonly incorporated into these items (Lintz and Zabawa 1984:169-170).

Settlement and Subsistence Strategies

Geographic Distribution of Sites. Evidence suggestive of widespread Apishapa phase occupation continues to accumulate. Lintz (1989:280) notes that the geographical distribution of Apishapa phase populations "seem to coincide with the mesa and canyon-land topography denoted by massive areal exposures of Cretaceous period Dakota sandstone and Graneros shales corresponding to the Raton Mesa portion of the Raton section of the Great Plains." The geographical limits of the Apishapa phase may be depicted tentatively by a line drawn from the northwestern corner of the Oklahoma Panhandle, through John Martin Reservoir to Fort Carson south of Colorado Springs; this boundary would then proceed south along the Rocky Mountain foothill region to the Cimarron River valley of northeastern New Mexico. Since publication of the previous research context (Eighmy 1984), a number of Apishapa phase components have been reported at or near the perceived northern and southern extent of the manifestation. Test excavations at Mary's Fort, Ocean Vista, Windy Ridge, Woodbine Shelter, and 5PE63, as well as the survey recording of large, surface, multiple-room sites such as Sullivan Butte and Susie's Place West, were completed at Fort Carson (Kalasz et al. 1993; Van Ness et al. 1990; Zier and Kalasz 1985). The information from these studies supplements earlier data from the Avery Ranch and Wallace sites indicating that high population levels during the Apishapa phase occurred well north of the Arkansas River but south of the Palmer Divide (Ireland 1968; Watts 1971; Zier et al. 1988). Along the perceived southern boundary, Winter (1988:76-77) reports "fortified" Apishapa phase villages and barrier walls in the Dry Cimarron River valley of northeastern New Mexico. Excavation of additional sites is necessary to elucidate the chronological and cultural relationships between sites in central/southern Colorado and northeastern New Mexico. However, the similarities currently seen suggest that Apishapa phase populations ranged for approximately 190 km (118 mi) along a broad north/south axis.

Additional Apishapa phase components in the core or south-central area are reported through survey, testing, and excavation. A number of multiple-structure architectural sites were recorded during recent surveys of the PCMS and Picket Wire Canyonlands (Andrefsky 1990; Kalasz 1988; Reed and Horn 1995). Important Apishapa phase data were recovered through a recent investigation of sites along the Apishapa River, particularly the excavations at the Cramer site and analysis of materials recovered from Snake Blakeslee (Gunnerson 1989). Also of interest was the test excavation of site 5LA5554 along Van Bremer Arroyo at the PCMS (Andrefsky et al. 1990). This unusual architectural site was characterized by 35 morphologically variable rooms, both aggregated and isolated, as well as an extremely dense and diverse artifact assemblage. Included in the collection were small, side-notched points, cord-marked ceramics, and a bison-dominated faunal assemblage typical of the Apishapa phase. In contrast to most Apishapa phase sites of this size, 5LA5554 is situated some distance from any deeply incised canyon country. In consideration of its basalt dike (hogback) location and piled rock room construction, the site appears most similar to the Developmental period Lindsay Ranch site near Golden (Nelson 1971). Finally, the excavation of Upper Plum Canyon Rock shelter I produced a wealth of information to enhance our understanding of the Apishapa phase, particularly with regard to perishable items (Rhodes 1984).

The eastern and western extent of Apishapa phase populations is known from fewer investigations. The eastern limits are known primarily through investigation by CC in the Carrizo Creek region (Nowak and Fiore 1987, 1988; Nowak and Headington 1983; Nowak and Jones 1984, 1985, 1986; Nowak and Kantner 1990, 1991; Nowak and Spurr 1989), and perhaps the Kenton Cave materials in the Oklahoma panhandle (Lintz and Zabawa 1984; Lintz 1989). Although the Carrizo Creek site data certainly indicate significant Apishapa phase occupation, the quantities of debris and architecture are not comparable to those of the "Classic Apishapa" sites of the core region (Gunnerson 1989; Nowak and Kantner 1990:xi). Similarly, large Apishapa phase

architectural site locations have not yet been confirmed along the foothills of the Rocky Mountains. Surveys near Canon City and along the Cucharas and Huerfano rivers west of Walsenburg do, however, suggest at least the presence of Apishapa phase occupation in these areas (Campbell 1969a:429-435; Lutz and Hunt 1979; Renaud and Chatin 1943).

Site Type and Locational Variability. Archaeological investigations undertaken throughout the region since publication of the previous research context (Eighmy 1984) corroborate the results of Campbell's (1969a) research in demonstrating considerable variability in Apishapa site types and settings (Andrefsky 1990; Andrefsky et al. 1990; Gunnerson 1989; Jepson et al. 1992; Kalasz et al. 1993; Nowak and Kantner 1990, 1991; Reed and Horn 1995; Rhodes 1984; Van Ness et al. 1990; Zier and Kalasz 1985; Zier et al. 1988; Zier et al. 1996a). However, architectural sites and rockshelters in canyon settings have generally been employed to define Apishapa phase settlement primarily because of their visibility. Campbell (1969a:22) acknowledged the effect of this sampling bias: "Obviously, the larger sites with structures of more permanent construction materials are more readily detected and therefore, are among the first to be discovered and investigated. Also, extensive sites are more apt to provide a greater quantity of materials needed for description and comparative purposes. Hence, attention to this type of site may have led to a disproportionate concentration on these, which in turn may have directed attention from other sites that could well be more typical of the culture. Economical and expeditious research would, for practical purposes, certainly be required to investigate those individual sites that promise to produce the maximum amount of evidence." It is apparent from Campbell's study, as well as the substantial Picket Wire Canyonland, PCMS, CC, and Fort Carson efforts, that the Apishapa phase probably encompassed a range of architectural and nonarchitectural sites in a variety of environmental niches. The major problem in interpreting this variability lies in determining which sites are of Apishapa phase affiliation. This is always a difficult proposition with survey data because it is characterized generally by a lack of precise chronological and stratigraphic information.

Although by no means extensive, excavation data acquired in the last 15 years have expanded archaeologists' perceptions of Apishapa phase settlement. These data permit some modification of Campbell's (1969a) pioneering and still widely cited assessment of such matters. Campbell's settlement model was greatly influenced by three major assumptions: that Apishapa phase groups were more concerned with farming than hunting and gathering; that settlement systems were centered around canyons and major drainages; and that there was a predilection for defensive habitation locales. A key element of the model involves the observation that because of a subsistence strategy oriented increasingly toward horticulture, "all large sites and sites with structures are found in the proximity of arable land (Campbell 1969a:391)." Though the definition of arable land can be debated, Campbell believed that wide, lower-canyon settings with expansive terrace deposits were preferred for the large horticultural villages. He also asserted that many of these site locations were defensive in nature; that is, they were situated in canyon settings that were difficult to access. Linear alignments of slabs believed representative of walls barring the approach to these sites were advanced as an additional defensive component. Rockshelters were perceived as foraging stations used before planting and after harvest. Their locations were thus influenced by water sources and the presence of diverse vegetation communities. Open nonarchitectural sites (termed campsites) were observed in all physiographic zones. Canyon campsites were believed to be associated with farming activities, while smaller, noncanyon campsites represented so-called hunting stations (Campbell 1969a:398).

Recent studies continue to emphasize the importance of canyon settings. This is not surprising given that these deeper drainage incisions are among the most prominent physiographic features on the plains of southeastern Colorado. Besides the terrace deposits believed representative of arable land, the canyons are characterized by permanent water sources, sheltered

locales, and the most diverse vegetative communities with the densest concentrations of economic species. Such settings would have been ideal for semisedentary hunter-gatherers who store food (Testart 1982; Kalasz 1988), as well as the horticultural villages that Campbell described. Although it remains accurate to posit canyons as the preferred setting for Apishapa phase residences, this descriptor actually encompasses considerable environmental variability. The geomorphology and biotic constituents of context-area drainage systems change dramatically from the headwaters through the rolling plains to the deeply incised lower canyons.

Apishapa phase architectural sites range from isolated structures to loci with multiple large aggregated room structures. Large architectural sites of this phase with dense and diverse cultural materials suggestive of residential base occupations are now known in a number of disparate canyon/drainage system niches. These sites continue to be found in the deep, wide, lower-canyon segments described by Campbell (1969a) as well as the shallow incisions of the upper canyon reaches (Andrefsky 1990; Andrefsky et al. 1990; Gunnerson 1989; Kalasz et al. 1993; Reed and Horn 1995; Van Ness et al. 1990; Zier and Kalasz 1985; Zier et al. 1988). It is reiterated that site 5LA5554 is a large architectural site situated on a basalt dike or hogback paralleling the shallow, noncanyon portion of Van Bremer Arroyo (Andrefsky et al. 1990). Furthermore, Apishapa phase architectural sites are reported in both defensive (e.g., Steamboat Island Fort, Darien's Fort, Sullivan Butte) and nondefensive (e.g., Cramer, Avery Ranch, Ocean Vista) settings (Campbell 1969a; Gunnerson 1989; Kalasz et al. 1993; Van Ness et al. 1990; Winter 1988; Zier et al. 1988). Smaller, prehistoric, open architectural sites, including isolated structures, are known throughout the context area. Most, however, are associated with survey projects and therefore lack the chronological information necessary to confirm their Apishapa phase affiliation. The CC investigations in the Carrizo Creek vicinity provide most of the data about these kinds of sites (Nowak and Kantner 1990). They are thought to have served as seasonal habitations where a range of hunting, gathering, and limited horticultural activities were accomplished (Nowak and Kantner 1990:36). This site sample is noted to be distributed primarily along the high benches or rims of canyons, although a single example was located on a bluff in the open plains. Two of the sites exhibit barrier walls.

Apishapa phase rockshelters were often situated in proximity to the open architectural residential bases, but the functional relationship(s) between the two settlement types remains unclear. Recent investigators are mixed in their support of Campbell's interpretation of a less intensive, specialized task function for rockshelter sites within the overall Apishapa phase settlement pattern (Kalasz et al. 1993:240; Nowak and Kantner 1991:153-155; Rhodes 1984:280). Rockshelters most often are characterized by the diverse assemblages and features associated with the larger architectural sites; the differences usually lie in the sheer volume of debris. For example, Woodbine Shelter is situated along Turkey Creek in proximity to two residential bases with architecture, the Avery Ranch and Ocean Vista sites; radiocarbon dates associated with these three sites correspond closely and are suggestive of contemporaneity (Kalasz et al. 1993:144-145; Zier et al. 1988:252). Although faunal and macrobotanical remains (including maize), pottery, projectile points, and substantial architecture are associated with all three sites, the assemblage at Woodbine shelter pales in comparison to the open sites in terms of overall quantity of material. Also, the shelter is associated primarily with small mammal remains and the two open sites primarily with bison. It is reiterated that many of the large, open architectural Apishapa phase sites in the context area display a specific economic orientation toward bison processing (Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Zier et al. 1988). The previously discussed trend for rockshelters to be strongly correlated with small mammal procurement certainly holds true for the Apishapa phase, but notable exceptions include the Sue site and Gimme Shelter (Andrefsky et al. 1990). The former is a deeply stratified multicomponent site. A transition from small game to large game procurement is evident in the vertical distribution of faunal remains;

large mammal bone, including bison, occurs in the uppermost levels. At Gimme Shelter large mammal bone was by far predominant.

As with Woodbine Shelter, diverse yet relatively insubstantial assemblages were recovered from Apishapa occupations such as Carrizo Rock shelter, 5BA24, Medina Rock shelter, Pyeatt Rock shelter, and the Sue site (Andrefsky et al. 1990; Campbell 1969a; Nowak and Kantner 1991). The Upper Plum Canyon Rock shelter I assemblage is somewhat anomalous (Rhodes 1984). Excavation produced some remarkably high numbers of artifacts: 140 ground stone artifacts, 459 chipped stone artifacts (including 30 projectile points), 108 beads, 21 pieces of modified shell, and more than 8,000 faunal remains. However, no ceramics were recovered. Despite the relatively abundant and diverse cultural debris, these data prompted the investigator to conclude that "in all, the recovered materials indicate that the shelter was most probably used by small hunting and processing task groups for short periods during the fall, winter, and early spring" (Rhodes 1984:280). The disparity between the assemblages at Woodbine Shelter and Upper Plum Canyon Rock shelter I suggests that the function of Apishapa phase rockshelters warrants further examination.

The absence of Apishapa phase hallmarks such as ceramics or Reed/Washita points necessitates the exclusion of Gimme Shelter, Pyeatt Rock shelter, and Medina Rock shelter from the table of radiocarbon-dated sites used to establish an age range for this phase (see Chronology section and Table 7-7, above). However, the radiocarbon dates from these three sites correspond well with those from nearby sites that exhibit the required diagnostic artifacts. Three sites are included in the discussion here because of indications that they served unique functions. All are located in tributary canyons of the Purgatoire River and exhibit diverse assemblages typical of Apishapa phase shelters. Pyeatt and Medina rock shelters are unique in the context area because they produced substantial maize remains; most of the maize associated with Campbell's Chaquaqua Plateau study was recovered from these two sites. A variety of wild plant remains was also found. Although the volume of these materials suggests some sort of warehouse function, it is notable that no storage features were found at either site. Storage features were recorded at Gimme Shelter but the only evidence of maize was associated with a single pollen wash from ground stone. In contrast, abundant wild plant seeds, especially those of goosefoot and amaranth, were reported from the site. Rock-lined bins or cists such as those recorded at Gimme Shelter are fairly rare in context-area rockshelters; furthermore, there is no confirmed evidence that they served as storage facilities for maize.

Although most rockshelters of the Apishapa phase are characterized by lower quantities of debris suggestive of relatively unintensive occupation (Campbell's [1969a] "foraging stations," for example), Trinchera Cave and Kenton Caves are notable exceptions (Lintz and Zabawa 1984; Simpson 1976). The cultural material from these sites was apparently substantial and diverse by any Apishapa phase standards, including those set by the larger, open architectural sites. Interpretation of occupation at Kenton Caves and Trinchera Cave is hampered by disturbed deposits and/or incomplete records. By all accounts, however, there is a clear possibility that Apishapa phase groups used these shelters (in fact, each site encompasses a series of shelters). The cultural debris reported from these sites appears comparable in all respects to that of open architectural residences such as the Cramer and Avery Ranch sites.

Open-setting nonarchitectural sites with an Apishapa phase affiliation confirmed through excavation are rare. Use of a local quarry by Apishapa groups was documented at 5BA22 but several rockshelters were also present within the site boundaries (Nowak and Kantner 1990:111). Windy Ridge at Fort Carson is believed to have functioned as a specialized task field camp (Kalasz et al. 1993). This site is situated in an open setting within a shortgrass prairie along a shallow, intermittent drainage. Like many Apishapa phase shelter sites, Windy Ridge is

characterized by a diverse collection that includes low quantities of chipped stone, ground stone, ceramics, plant remains, and faunal remains. However, no perishable items, bone tools, or shell artifacts were recovered. Several very simply constructed, rock-filled hearths were recorded; associated macrobotanical samples yielded low densities of charred wild plant seeds (primarily goosefoot) and cultigens (maize). The faunal collection consisted primarily of large, unidentifiable artiodactyls and bison, again in small amounts. Based on testing data, it appears that a variety of domestic tasks was undertaken at this site but the levels of such activities were very restricted. Rather than a specialized processing area, Windy Ridge appears to be an overnight stop for a small Apishapa group.

Economy. The perception that Apishapa phase groups employed a dual foraging/horticultural economy requires further examination. The definition of such an economy is sufficiently vague to encompass quite a range of subsistence strategies. Representing the far end of a scale depicting increasing reliance on cultigens, Campbell (1969a) asserted that Apishapa phase settlements on the Chaquaqua Plateau were sedentary farming communities. In contrast, recent investigators tend to downplay the importance of horticulture among Apishapa phase populations (Gunnerson 1989:52; Kalasz 1988; Lintz 1989:282; Nowak and Kantner 1991:157-160; Zier et al. 1988:268). There is still no evidence of Apishapa phase horticultural villages that were occupied year-round. "Given the absence of substantial middens at most architectural sites, it is difficult to envision permanent year-round habitation and a maize-beans-squash horticulture subsistence base ... architectural sites do tend to occur in association with major watercourses, however, which often provide expanses of potentially arable bottom lands (Kalasz et al. 1993:23)." Zier et al. (1988:268) advance the notion of a fundamental hunter-gatherer economic pattern within the Apishapa phase: "Horticulture is certainly in evidence at Apishapa sites, but maize appears not to have been a critical resource; beans and squash have not been found." Similarly, Lintz (1989:268) believes that Apishapa subsistence practices "...reflect a combination of generalized foraging and minimal horticultural activities."

The Apishapa phase clearly falls somewhere between two extremes in the North American settlement-subsistence pattern: small, nomadic foraging bands and sedentary horticultural communities (Kalasz 1988:3). Recent studies have emphasized the considerable variability in adaptive strategy that is encompassed by the terms "forager" and "hunter-gatherer" (Bettinger 1991; Kelly 1995). Given past fluctuations in the context area's arid climate and the diversity of physiography, hydrology, and biotic resources, the adoption of a fluid, dynamic hunter-gatherer strategy with a variable emphasis on sedentism and mobility may have been a distinct advantage for Apishapa phase groups. With such an economy, it may be true that "the greatest range of cost effective options is not necessarily associated with simple mobile bands or complex, sedentary societies, but with those groups intermediate between these two typological extremes" (Lightfoot 1983:199). Because the availability of resources such as bison likely fluctuated throughout the Diversification period, it is presumed that the Apishapa phase economy did not remain static. Certain options may have been emphasized over others in response to climatic or other conditions. It remains to be verified, however, whether economic factors in part led ultimately to the dispersal of Apishapa phase populations.

As is the case with trade items, maize is consistently found in low quantities at Apishapa phase sites across the context area. Campbell's (1969a:Table 10) interpretation of increased reliance on horticulture is based largely on the unusually large quantity of maize remains (including 244 cobs) recovered from Medina Rock shelter and, to a lesser extent, Pyeatt Rock shelter. Maize remains are known from open-setting architectural sites as well as rockshelters. In addition to the previously discussed rockshelters, such remains (either micro- or macrobotanical) were recovered from the following Apishapa phase contexts: Upper Plum Canyon Rock shelter I, Gimme Shelter, Trinchera Cave, and possibly 5BA320 in the Purgatoire River and Carrizo Creek

vicinities (Andrefsky et al. 1990; Nowak and Jones 1986; Rhodes 1984; Scott 1984; Simpson 1976); at the Snake Blakeslee site along the Apishapa River (Gunnerson 1989; Ireland 1968); and at Woodbine Shelter, 5PE63, and the Wallace, Avery Ranch, Ocean Vista, Windy Ridge, and Pictograph sites north of the Arkansas River in the vicinity of Turkey Creek (Ireland 1968; Kalasz et al. 1993; Watts 1971; Van Ness et al. 1990; Zier et al. 1988). Although maize is conspicuously sparse along the Apishapa River relative to the area north of the Arkansas River, this situation may reflect sampling disparities. It must be emphasized that, whereas numerous flotation samples have been processed from the latter area, none was derived from the Apishapa River investigations. The question also arises as to whether maize was grown in the region or arrived through trade. Maize in skin pouches and grass packets was recovered from the few rockshelters with conditions permitting the preservation of perishable items; these items may thus represent transport containers or "carrying cases" that facilitated trade in cultigens (Kalasz 1988:32; Lintz 1989:283; Lintz and Zabawa 1984). Subsequent investigators have emphasized further the need to examine the possibility of context-area maize trade (Nowak and Kantner 1991:159-160; Snow 1991). Conversely, the common occurrence of cobs and cob fragments at Apishapa sites would seem to imply that maize was grown locally.

Wild plant remains from Apishapa phase contexts are often abundant and diverse. Macrobotanical evidence gathered to date indicates that charred goosefoot seeds are the most prevalent vegetal food items in the context area (Andrefsky et al. 1990; Kalasz et al. 1993; Scott 1984; Van Ness 1986; Zier et al. 1988). Other wild plant remains from Apishapa phase contexts include purslane, tansy mustard, pea family, gromwell, sedge, globe mallow, sunflower, pigweed, various grasses (including Indian ricegrass), yucca, cactus (both hedgehog and prickly pear), chokecherry, hackberry, wild grape, wild plum, wild gourd, pinyon, juniper, and skunkbrush (Andrefsky et al. 1990; Kalasz et al. 1993; Lintz 1989; Lintz and Zabawa 1984; Nowak and Kantner 1990, 1991; Scott 1984; Simpson 1976; Van Ness 1986; Zier et al. 1988). These data are inconclusive in interpreting site seasonality because of the potential for storing plant remains. For example, although goosefoot seeds may have been harvested in the late summer or early fall, processing and/or consumption may not have occurred until later in the winter or early spring (Zier et al. 1988:264).

Faunal remains from Apishapa contexts have not in all cases been analyzed (Ireland 1968; Nowak and Kantner 1990, 1991), but current data are indicative of a modest trend for small mammals, particularly leporids and prairie dogs, to be prevalent at rockshelters (Campbell 1969a; Kalasz et al. 1993; Rhodes 1984). Conversely, large mammals (particularly bison) are predominant at open-setting sites. Butler (1997) presents data suggesting that rabbit was preferred over large mammals among Apishapa populations, but the study is based on scant presence/absence observations and does not address the perceived functional differences between rockshelters and open-setting sites. Small mammals were obviously an important part of Apishapa phase subsistence, and throwing sticks, snares, and cordage recovered from certain rockshelters probably attest to the means of their procurement (Lintz and Zabawa 1984; Rhodes 1984; Simpson 1976). Feature 10 at 5LA3570 in the PCMS is interpreted as a game drive, but additional investigation would be required to determine if the site was associated with bison procurement (Charles et al. 1996:7.12-7.14). Bison processing loci include architectural sites such as Avery Ranch, Cramer, Snake Blakeslee, and Ocean Vista, as well as the smaller, nonarchitectural, field camp operation at Windy Ridge (Gunnerson 1989; Kalasz et al. 1993; Watts 1971; Zier et al. 1988). Bone element analysis suggests that bison were generally field butchered at a nearby kill site and certain carcass segments transported to the architectural sites for further processing (Hamblin 1989:199-252; Zier et al. 1988:239-251). Large quantities of fragmentary bone at these sites indicate that the various elements were shattered to extract marrow. Unfortunately, the fragmentary condition of Apishapa phase bison remains has to date precluded recovery of intact mandibles necessary for conclusive interpretations of seasonality. Avery Ranch site investigators

offer the following speculation: "Bison may be hunted at any time of the year that they are available and may be taken in large or small numbers. However, bison herding behavior is such that conditions for mass kills are most favorable during the fall of the year. The Avery Ranch site faunal assemblage is thus suggestive of a fall kill, although this notion is by no means conclusive" (Zier et al. 1988:264).

Other faunal remains recovered in lesser quantities from Apishapa phase contexts, and which may or may not represent subsistence items, include large mammals such as deer, pronghorn, and bighorn sheep; medium mammals such as fox and other canid, badger, beaver, bobcat, skunk, and porcupine; a variety of small mammals such as chipmunk, mouse, woodrat, kangaroo rat, ferret, ground squirrel, and pocket gopher; avian species such as eagle, hawk, owl, turkey, Cooper's hawk, sparrow hawk, sandhill crane, lesser prairie chicken, pigeon, meadowlark, and magpie; and a variety of other animals such as prairie rattlesnake, milk snake, Great Plains ratsnake, lizard, turtle, toad, bullfrog, and crayfish. Fish are conspicuously absent but evidence of indigenous freshwater mussels is common. Mussels served as a subsistence item, and the shells were modified for use as tools and ornaments. The greater portion of the preceding list was generated by the Cramer site and Upper Plum Canyon Rock shelter I excavations, which to date have produced the most diverse and substantial Apishapa phase faunal collections (Rhodes 1984; Hamblin 1989:Tables A-1, A-2). The presence of hawk, eagle, and owl bone at the Cramer site is believed to be indicative of religious or ceremonial pursuits rather than food consumption (Hamblin 1989:207).

Architecture. An overall synthesis of Apishapa phase architectural variability such as that completed for Antelope Creek phase structures (Lintz 1984) is not possible. There are few instances in which Apishapa phase architectural sites have been excavated sufficiently to permit a comprehensive view of structural elements. The architectural typology developed by Kalasz (1988, 1989, 1990) is based on surface-recorded structures confined to a relatively small portion of the context area. Although the purpose of the study was to examine the temporal sensitivity of PCMS architectural classes and categories through observations of wall and room morphology, its conclusions were restricted by a paucity of absolute dates. At best, this typology is useful for introducing some standardization in the recording and subsequent classification of architecture found during survey. To a lesser extent, the study offers some insight into architectural variability and settlement pattern as observed by the spatial distribution of specific architectural forms (Kalasz 1988).

Apishapa phase architecture occurs in both rockshelter and open settings. Isolated and aggregated room structures are common in open settings; rockshelters typically exhibit single rock walls aligned along the dripline or, less often, bisecting the interior. The jacal structure reported at Trinchera Cave is unique but the cultural affiliation is not confirmed (Simpson 1976). Other examples of rockshelter architecture typical of the Apishapa phase include 5BA24, Umbart Cave, Pyeatt Rock shelter, Gimme Shelter, Upper Plum Canyon Rock shelter I, and Woodbine Shelter (Andrefsky et al. 1990; Campbell 1969a; Kalasz et al. 1993; Rhodes 1984). Woodbine Shelter is somewhat unusual in that the single architectural unit is a massive, slab enclosure tucked within the dripline (Kalasz et al. 1993:224-240). Further, a wood post indicative of a brush superstructure was exposed within the enclosure. A brush superstructure not associated with a rock wall is suggested by an arrangement of post holes reported at 5BA24 (Nowak and Kantner 1991:114). The superstructure is described as a layer of decayed vegetal matter extending away from a line of some 60 postholes; a corresponding series of notches for the poles was reportedly situated along the "roof line" (Nowak and Kantner 1991:114). In contrast, at Gimme Shelter the architecture appears to be largely related to the construction of slab-lined storage pits (Andrefsky et al. 1990:539-583).

Apishapa phase structures in open settings have been more extensively excavated than those associated with rockshelters. These morphologically diverse examples, ranging from small isolated units to large aggregated room structures, are reported in numerous, widespread locations across the context area. Such architecture may have morphological antecedents in structures that appeared during the preceding Developmental period. Prominent open-setting architectural sites include Darien's Fort, Steamboat Island Fort, Sorenson, 5LA2169, 5LA1725, 5LA5554, Cramer, Snake Blakeslee, Juan Baca, Canterbury, Munsell, Avery Ranch, Mary's Fort, Ocean Vista, and Wallace (Campbell 1969a; Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Kingsbury and Nowak 1980; Loendorf et al. 1996; Nowak and Berger 1982; Watts 1971; Winter 1988; Zier et al. 1988; Zier and Kalasz 1985). Although the distribution of these sites describes an immense area encompassing much of the plains portion of the context area, the number of fully excavated sites is insufficient to allow adequate assessments of spatial trends in architectural morphology. It is obvious that the imposing, palisade-style, rock-walled structures of the Snake Blakeslee and Cramer sites are unique in the context area. Gunnerson (1989:129) contends that at Snake Blakeslee this situation was prompted by the massive exposures of cliff face sandstone. Wall construction therefore "simply reflects the abundance of such material, readily available at the site in various shapes and sizes, plus the scarcity of large trees .... In brief, architectural styles were opportunistic, utilizing available materials and adapting construction techniques to immediate conditions." In contrast, the Cramer site was believed to have been built as a fully integrated complex including a sizable primary room whose presence "could be interpreted as an attempt to construct a Plains earthlodge utilizing rock for the walls and four roof supports" (Gunnerson 1989:130). The perceived dichotomy between architectural construction techniques at the Snake Blakeslee and Cramer sites may have led Gunnerson (1989:120) to conclude, "I am convinced that in some cases there are definite cultural traditions represented while elsewhere there was little more than the opportunistic use of readily available building material - rock that occurred or broke naturally into pieces of convenient size." Lintz (1989:282) saw a similar serendipitous approach to Apishapa phase construction: "Considerable variability in room form, size, feature content and construction methods reflect different jerry-rigged procedures or adaptive solutions used to address local problems." Somewhat analogous to Gunnerson's assessment of Cramer site architectural layout, Zier et al. (1988:265) asserted that architectural components at the Avery Ranch site reflected a planned design (previous discussion). Clarification of these generalized observations of Apishapa phase architecture awaits additional large-scale excavation.

Excavations completed since publication of the previous research context (Eighmy 1984) permit a tentative summary of specific architectural attributes of the Apishapa phase. First, use of the term "masonry" to describe the rock wall foundations of many Apishapa phase structures is stretching the definition. Whether it is due to postabandonment collapse or not, many walls have the appearance of rock piles rather than purposely arranged slabs. Then again, the painstakingly set vertical slab walls of the Cramer site undoubtedly required considerable investment of effort in their construction (Gunnerson 1989). Excavations undertaken thus far indicate that, despite their variable nature, the distinctive curving rock walls of the Apishapa phase are used primarily to buttress some sort of wood pole and brush (or perhaps hide) superstructure (Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Zier et al. 1988). Apishapa architecture is most often associated with canyon rims or bluffs overlooking drainages; such settings are generally characterized by shallow soil deposits that offer only spotty opportunities for excavation of deep postholes. Bedrock cracks and crevices exposed in the thin soil mantle are sometimes used in conjunction with slab shims to brace the poles. Some house poles may be supported entirely by excavated pits but others are associated with rock collars situated around their base. A bison bone shim supplemented the rock collar at the Avery Ranch site (Zier et al. 1988:Figure 29). The number of poles and their configuration varies greatly among Apishapa phase structures. Structure 2 at the Avery Ranch site (see Figure 7-3) is estimated to have employed 21 poles around its outer edges; no central support posts were present (Zier et al. 1988). A similar situation is evident at Houses 1

and 7 at the Wallace site (Ireland 1968). In contrast, certain structures at the Cramer and Wallace sites exhibit central roof supports (Gunnerson 1989; Ireland 1968). A four-post arrangement reminiscent of Plains Village structures is exposed in Room A at the Cramer site and possibly House 3 at the Wallace site; these are, to date, rare occurrences among Apishapa architecture. The large communal processing area believed to be represented by Structure 1 at the Avery Ranch site exhibited no posts, but only a relatively small portion of the wall area was excavated (Zier et al. 1988).

Most of the rock associated with Apishapa phase walls consists of wedged and/or shimmed slabs that supply the bulk necessary to stabilize the overall structure. Where possible, pits and/or trenches were excavated in the soil to provide footings for the rock; clay-filled basins supporting wall slabs are reported at the Cramer site (Gunnerson 1989:26-27). Rocks may be set horizontally or vertically; the degree to which each is emphasized varies from site to site (Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Nowak and Headington 1983; Nowak and Kantner 1990:30-37; Zier et al. 1988). Substances identified as daub or clay are associated with a variety of Apishapa phase structures (Gunnerson 1989; Ireland 1968; Kalasz et al. 1993; Zier et al. 1988). The fact that these materials sometimes exhibit stick or grass impressions and are situated above the house floor suggests superstructures with some sort of earthen coating; an especially extensive and pronounced layer of daub was reported at the Ocean Vista site (Kalasz et al. 1993). Structures have been recorded with and without definable entryways; all of the Wallace site structures exhibited east- or southeast-facing entryways (Ireland 1968). Apishapa walls generally display some degree of curvature, but overall structure shapes vary considerably, as do room sizes. Room sizes range from those measuring a few meters across to large, possibly communal work areas at the Cramer and Avery Ranch sites that are 7 to 15 m in diameter (Gunnerson 1989; Kalasz 1990; Zier et al. 1988). This variability is believed to reflect differing room functions, but as Lintz (1989:282) notes, "few studies have addressed the functional issue by rigorously examining room attributes and contents." Tool diversity indices were employed for a limited view of variability in room functions at the Avery Ranch site. The analysis suggested the presence of discrete domiciles versus areas where communal processing tasks were accomplished (Zier et al. 1988).

Overall, the interior features associated with Apishapa structures are sparse and rudimentary in comparison with those of Plains Village (e.g., Antelope Creek phase) and Sopris phase affiliation. Floors are irregular or shallow basins sometimes plastered with clay mixtures; uneven surfaces smoothed with packed daub are also reported (Gunnerson 1989; Ireland 1968; Zier et al. 1988). Apishapa phase structures commonly exhibit interior fire-related features, some of which are recorded as formal central hearths (Gunnerson 1989; Ireland 1968; Nowak and Kantner 1990:30-37). Most interior hearths are shallow, irregularly shaped features characterized by little effort invested in their construction. Interior subfloor features such as bell-shaped pits or slab-lined storage cists have only rarely been recorded (Ireland 1968:16). A slab-lined feature interpreted to be a probable storage cist was excavated at the Avery Ranch site. The feature abutted the Structure 1 wall exterior (Zier et al. 1988). Finally, clay-lined basins believed to have served as vessel supports are reported at the Wallace site (Ireland 1968).

Sopris Phase

Introduction

The Sopris phase of the Diversification period was first defined by Dick (1963). His initial formulation placed the Sopris phase within the Upper Purgatoire complex, presumably under the expectation that additional temporally contiguous phases would later be defined. Although the origin of the term "complex" is uncertain, it was likely used in the Trinidad district to emphasize the observed differences between sites located along the lower reaches of the

Purgatoire River and those of the Trinidad district proper. Subsequently, Baker (1964) proposed the St. Thomas phase to describe the earliest sites of the Diversification period in the upper valley. However, based on new excavation data as well as on a reexamination of previous work, Ireland (1971) demonstrated convincingly that this construct was not supported by adequate data and should be abandoned. As is discussed below, Wood and Bair (1980) later expanded the definition of the Sopris phase to include effectively all early Diversification period manifestations in the upper Purgatoire River valley. In practice, then, the term "Upper Purgatoire complex" has come to be synonymous with the term "Sopris phase." The latter designation is retained here, owing to the ambiguous nature of the term "complex."

Dick (1963) defined the Sopris phase primarily on the basis of architecture and ceramics. Structures are rectangular or subrectangular, contain two to 10 rooms, and are constructed from masonry and adobe in varying proportions. Floor features include slab-lined cists and basin hearths with raised adobe collars. Some structures contain ground-level entryways. The ceramics associated with these structures include polished wares; cordmarked wares; Sopris Plain, an indigenous culinary ware; Taos Gray (Plain, Incised, and Punctate varieties); and Taos or Kwahe'e Black-on-white wares. Burials are generally located beneath structure floors or in abandoned rooms. Dick also provides a "laundry list" of chipped stone and bone tool types, including corner-notched, side-notched, and unnotched projectile points; various types of ground stone tools; splinter awls; and tubular bone beads.

In practice, sites have been assigned to the Sopris phase when they contain either rectilinear stone masonry architecture or Taos Incised or Taos Black-on-white sherds. Sites that exhibit these characteristics have been documented along the main stem and major tributaries of the Purgatoire River; in the highlands south and west of Trinidad, Colorado and Raton, New Mexico; along the Vermejo, Ponil, and Cimarron rivers on the southern tip of the Park Plateau; and along both the eastern and western margins of Fisher Peak, south of Trinidad. Site locations include ridges and promontories, benches and high river terraces, and valley bottoms. Sites are located in both open and sheltered settings, although all known habitation structures are located in open settings.

Several other cultural-temporal systems have been used to organize early and middle Diversification period archaeological data in the Vermejo and Cimarron districts. For sites in the Vermejo district, Biella and Dorshow (1997a) adopt the term "Late Prehistoric Period" to describe the relatively few sites that date to that period in their Ancho Canyon/York Canyon project area. In part, this terminology reflects the continuing taxonomic ambivalence of researchers working in the area, and the difficulty of reconciling Southern Plains and Southwest taxonomic systems. Although early researchers highlighted the ceramic and architectural similarities among sites located on the Park Plateau and those located in the northern Rio Grande valley, later research has tended to emphasize local continuity and cultural, if not social and economic, connections with sites in the Plains.

For the Cimarron district, Glassow (1980) utilizes a cultural-temporal system that is based on the Pecos Classification, and is a continuation of the Developmental period sequence for the district (Table 7-8). Two phases or periods, plus portions of another, are defined for the Diversification period.

Table 7-8. Cultural-Temporal System of Glassow (1980) for Cimarron District.

Phase Name	Dates	Criteria/Characteristics
Cimarron	A.D. 1200-1300	Cimarron Plain; Taos Neck-banded, Incised, Punctate; Santa Fe Black-on-white
Ponil	A.D. 1100-1250	Taos Incised or Punctate
Escritores	A.D. 900-1100	Kiatuthlanna or Red Mesa Black-on-white

No radiocarbon dates are available from the Cimarron district for these phases, and the ceramic chronology for the northern Rio Grande has been reevaluated and modified since Glassow developed this sequence (Cordell 1989). Although portions of the Escritores phase fall within the Diversification period, this reevaluation suggests that the Ponil phase is the first phase of the Diversification period in the Cimarron district; Escritores phase manifestations are discussed in the Developmental period section. Glassow (1980, 1984) applied this system to extensive survey and limited excavation data from the Cimarron district and portions of the Vermejo district.

Intensive excavation efforts began in the Trinidad district in 1952 (Dick 1954; Lintz 1999) under the direction of Haldon Chase who had received funding from TSJC (see Chapter 3 summary). Chase, a pioneer in the archaeology of the Apishapa phase, concentrated his work in the Trinidad district on the Sopris site (5LA1415), a large masonry structure which was later considered by Herbert Dick (1963) to be the "type site" for the phase. The archaeological program at TSJC expanded when Dick replaced Chase in 1953, and work began on the ACOE Trinidad Lake Flood Control project. Dick initiated an extensive survey of the reservoir pool area and continued the excavations at the Sopris site begun by Chase in 1952. Between 1954 and 1977, at least 18 Sopris phase structures were excavated. Including Chase and Dick, these excavations were directed by seven different principal investigators, all of whom were associated with TSJC. Four additional structures are known to have been excavated, but the results of these projects have never been reported.

The results of the Trinidad State investigations are reported by Baker (1964, 1967), Dick (1954, 1963, 1974), Dore (1993), Hand et al. (1977), Ireland (1970, 1974a, 1974b), Ireland and Wood (1973), Mitchell (1997), and Wood and Bair (1980). Summaries and discussions of these data are provided by Bair (1975), Ireland (1971), McCabe (1973), and Mitchell (1998). Important data have also been generated by compliance investigations for highway and energy-related projects elsewhere in the Trinidad district (Baker 1965; Gleichman 1983; Indeck and Legard 1984; Lutz and Hunt 1979; McKibbin et al. 1997; Rood 1990; Rood and Church 1989; Tucker 1983).

Significant data on Diversification period sites in the Cimarron district have been reported by Glassow (1980, 1984), and Lutes (1957, 1958, 1959a, 1959b, 1960). In the Vermejo district, Campbell (1984), Kershner (1984), and Biella and Dorshow (1997a) provide valuable insight into Diversification period manifestations.

Chronology

Dick's (1963) preliminary chronology, which was based exclusively on production dates for northern Rio Grande black-on-white trade wares, placed the Sopris phase occupation of the Trinidad district within the thirteenth century (A.D. 1225-1275). Both Baker (1964) and Ireland (1971) suggested that the phase probably began earlier, perhaps as early as A.D. 1000. Subsequent revisions of the northern Rio Grande ceramic chronology (Peckham and Reed 1963; Wetherington 1968), as well as a suite of 10 archaeomagnetic dates from the Trinidad district,

persuaded Wood and Bair (1980) to further modify this framework. Coupled with a preliminary analysis of Sopris phase architectural forms, they proposed three subphases which included the Initial Sopris (A.D. 1000-1100), the Early Sopris (A.D. 1100-1150), and the Late Sopris (A.D. 1150-1225). Breternitz (1969) reports two radiocarbon dates which generally support this chronology, although the large standard deviation of both assays limits their utility. Owing to the likelihood of contamination, all 10 radiocarbon dates reported by Wood and Bair (1980:226) were rejected.

To define better the Sopris phase chronology, 34 samples from five sites were submitted for radiocarbon assay (Mitchell 1997). All of these samples consisted of either large architectural timbers or corncobs, and were chosen from floor or floor-fill contexts of structures, or from discrete nonarchitectural features such as storage pits or hearths. The original archaeomagnetic data were also recalibrated using the most recent Southwestern Archaeomagnetic Master Curve (Eighmy and Doyel 1987; Mitchell 1997). These data are summarized in Tables 7-9 and 7-10.

Table 7-9. Radiocarbon Dates from Sopris Phase Sites.

Site/Structure	Conventional Age (B.P.)	Calibration Curve Intercept (A.D.)	2-Sigma Calibrated Date (A.D.)	Context
5LA1416/Str. 1	740 ± 70	1280	1180-1395	Stone masonry structure; floor
5LA1416/Str. 1	780 ± 60	1265	1170-1300	Stone masonry structure; floor
5LA1416/Str. 3	830 ± 50	1225	1055-1090 1150-1285	Adobe structure; floor
5LA1416/Str. 1	890 ± 50	1175	1025-1260	Stone masonry structure; floor fill
5LA1445	910 ± 50	1165	1020-1245	Stone masonry structure; floor fill
5LA1417/Fea. A	920 ± 50	1065-1075-1155	1015-1235	Stone masonry structure; floor fill
5LA1211/Str. 2	920 ± 50	1065-1075-1155	1015-1235	Jacal structure; floor
5LA1416/Str. 1	930 ± 60	1055-1090-1150	1000-1245	Stone masonry structure; floor fill
5LA1417	940 ± 60	1045-1105-1115	995-1235	Stone masonry structure; floor
5LA1416/Str. 2	950 ± 50	1040	1000-1215	Jacal structure; subfloor pit*
5LA1416/Fea. 90	950 ± 60	1040	990-1225	Hearth below adobe structure*
5LA1416/Str. 1	960 ± 50	1035	995-1205	Stone masonry structure; floor

Site/Structure	Conventional Age (B.P.)	Calibration Curve Intercept (A.D.)	2-Sigma Calibrated Date (A.D.)	Context
5LA1416/Str. 5	960 ± 50	1035	995-1205	Mortuary pit; fill**
5LA1417/Fea. A	960 ± 60	1035	985-1220	Stone masonry structure; floor
5LA1211/Str. 3	980 ± 50	1030	985-1180	Adobe/stone masonry structure; floor fill
5LA1417/Fea. A	990 ± 60	1025	970-1195	Stone masonry structure; floor
5LA1424/Fea. B	990 ± 60	1025	970-1195	House pit; floor fill
5LA1211/Str. 3	990 ± 50	1025	980-1175	Adobe/stone masonry structure; floor fill
5LA1211/Str. 2	1000 ± 50	1020	975-1170	Jacal structure; floor
5LA1211/Str. 3	1010 ± 60	1020	990-1040	Adobe/stone masonry structure; floor
5LA1211/Str. 4	1020 ± 50	1015	990-1035	Jacal structure; floor
5LA1416/Str. 1	1040 ± 50	1005	895-1045 1105-1115	Stone masonry structure; floor
5LA1416/Fea. 31	1040 ± 40	1005	960-1035	Bell-shaped pit; basal fill
5LA1445	1060 ± 60	995	880-1045 1105-1115	Stone masonry structure; floor fill
5LA1416/Str. 2	1080 ± 60	985	865-1035	Jacal structure; roof beam
5LA1416/Str. 1	1090 ± 60	980	855-1035	Stone masonry structure; floor fill
5LA1417/Fea. A	1130 ± 80	905-920-950	705-1035	Stone masonry structure; floor
5LA1416/Str. 6	1140 ± 60	895	775-1015	House pit; floor fill**
5LA1416/Str. 2	1190 ± 50	875	705-980	Jacal structure; post
5LA1416/Str. 1	1200 ± 50	865	695-975	Stone masonry structure; floor fill

Site/Structure	Conventional Age (B.P.)	Calibration Curve Intercept (A.D.)	2-Sigma Calibrated Date (A.D.)	Context
5LA1211/Str. 2	1210 ± 50	855	690-970	Jacal structure; floor fill
5LA1424/Fea. B	1230 ± 50	790	680-905 920-950	House pit
5LA1416/Str. 2	1240 ± 90	785	645-995	Jacal structure; subfloor pit* (**)
5LA1416/Str. 2	1290 ± 50	705	655-875	Jacal structure*

* Sample may be from a disturbed provenience.
** Radiocarbon age determined from corncob; conventional age includes $^{12}C/^{13}C$ correction

Table 7-10. Archaeomagnetic Dates from Sopris Phase Sites.

Site/Structure	Archaeomagnetic Date Ranges (A.D.)	Context
5LA1416/Fea. 90	740-790 830-875	Hearth below adobe structure
5LA1211/Fea. 15	925-1020 1275-1475 1500-1750	Extra-architectural storage pit
5LA1211/Fea. 53	925-975 1575-1635	Hearth below jacal structure
5LA1416/Str. 3	935-1025 1175-1500 1500-1700	Adobe structure
5LA1416/Fea. 79	950-1010 1310-1400 1650-1700	Extra-architectural storage pit
5LA1211/Str. 6	1000-1050 1300-1400 1675-1725	House pit
5LA1211/Str. 2	1025-1350	Jacal structure
5LA1416/Fea. 31	1125-1150	Extra-architectural storage pit
5LA1211/Fea. 59	1300-1400 1675-modern	Extra-architectural hearth

In addition to these absolute dates, recent attempts to refine the cultural chronology for the northern Rio Grande provide important information about the timing of the Sopris phase (Boyer et al. 1994; Crown 1990). Data from Valdez phase sites near Taos, New Mexico, demonstrate that the imported culinary wares so common on early Diversification period sites along the eastern slope of the Sangre de Cristo Mountains, and by which the Sopris phase is largely defined, could not have been produced prior to about A.D. 1050. Mitchell's (1997) examination of ceramic technology and composition demonstrates further that the Taos culinary wares recovered from Sopris phase sites were in fact produced in the Taos district, and not manufactured locally. Taken together these data indicate that Sopris phase sites on the Park Plateau postdate the middle of the eleventh century.

Ceramic cross-dates can also be used to bracket the probable abandonment of communities in the upper Purgatoire River valley by Sopris peoples. This evidence is negative: the complete lack of the carbon-painted Santa Fe Black-on-white, as well as the paucity of corrugated gray ware jars, indicates that the district was abandoned before A.D. 1200. This is the widely accepted date for the initial production of such vessels in the northern Rio Grande valley (Cordell 1979, 1989). As will be discussed in greater detail below, sherds of these types are known from the Cimarron district, suggesting that the Diversification period occupation was somewhat longer-lived there. On the other hand, the radiocarbon and archaeomagnetic data suggest that at least some structures in the Trinidad district may have been remodeled or reused after A.D. 1200. Three of the 34 radiocarbon dates have calibration curve intercepts in the thirteenth century.

Several conclusions can be drawn from these data. First, some of the structures and features documented in the Trinidad district predate the Diversification period. Generally, the earliest dates come either from shallow pit structures or from features that occupy the lowest stratigraphic position at each site. Some of these dates are associated with a few indigenous brown ware ceramics, and none is associated with Taos culinary wares. The notion that semisubterranean pit structures are one of the earliest architectural forms in the district, a suggestion first proposed by Eighmy and Wood (1984), is supported by excavation data from the Running Pit House site (Dick 1974). All of these structures and features therefore predate the Sopris phase. On the other hand, these data also demonstrate the potential magnitude of the old wood problem. For example, the calibrated, two-sigma date ranges for the eight samples from Structure 1 at 5LA1416, all of which derive from large, architectural elements and from floor proveniences, span a period of seven centuries. Given that the use life of Structure 1 is unlikely to have exceeded 50 or 75 years, even with extensive remodeling, it is apparent that some of these samples derive from old or reused logs.

The second conclusion is that the Trinidad district witnessed a "construction boom" early in the eleventh century. Calibration curve intercepts for 19 of the 34 dated samples fall in the century between A.D. 950 and 1050. Given the statistical nature of radiocarbon samples, and the potential problems associated with old or reused wood, it is apparent that the beginning of the Sopris phase was relatively abrupt. Combined with the recent ceramic data from the Taos district, this suggests that the Sopris phase began at or immediately after A.D. 1050. However, by themselves these data do not indicate whether this major construction episode predates or postdates the initiation of intensive contact and ceramic exchange with the northern Rio Grande area.

Third, as is discussed in greater detail below, it is not possible to distinguish discrete subphases on the basis of architectural form or construction technique or materials. The radiocarbon data indicate that stone masonry, jacal, and adobe structures were all constructed and used more-or-less simultaneously.

Taken together, these chronological data indicate that the Sopris phase in the Trinidad district dates to the period between A.D. 1050 and A.D. 1200, and further that the subphase distinctions proposed by Wood and Bair (1980) should be abandoned. However, these data also demonstrate that the district was occupied prior to the Sopris phase (see the Developmental period chronology section for a detailed discussion), and it may have been reoccupied during the thirteenth century. There is also limited chronological data to suggest that the Sopris phase in the Cimarron district persisted somewhat longer than in the Trinidad district.

Population Dynamics

As noted above, it is clear that the number of known Sopris phase structures far exceeds the number of Developmental period structures in the Trinidad district. A similar observation can be made for the Cimarron district (Glassow 1980). Moreover, these structures appear to have been constructed over a relatively short period of time. Whether this period of intensive construction was accompanied by a population increase, or simply by population aggregation, is a matter of conjecture. Certainly later stone masonry and adobe structures leave much more visible remains. In addition, data from the Vermejo district (Biella and Dorshow 1997a) and Cimarron district (Glassow 1980) suggest that significant shifts in settlement patterns may have characterized the late Developmental and early Diversification periods on the Park Plateau.

Conversely, later structures tend to be somewhat larger than their predecessors, and contain more storage space. Moreover, many of these structures show evidence of having been remodeled and expanded during the time they were occupied, suggesting that either the size or productivity of the individual households increased during the Sopris phase. In the Trinidad district, although the overall size of particular structures appears to have increased substantially through their uselife, much of this increase can be attributed to an increase in storage space. The ratio between storage and habitation floor space increased to a maximum of roughly 3:1 and 4.5:1 at two of the most completely excavated structures. Smaller structures tend to have a more equal distribution of space, although the smaller artifact assemblages associated with many suggests that they may have been in use for shorter periods of time. These data may indicate that increases in productivity, and hence the need for larger storage spaces, account for some of the increase in structure size and, therefore, archaeological visibility.

Glassow (1980), however, notes that the number of sites attributable to the early and middle Diversification period (which he defines as the Ponil and Cimarron phases) was greater than the number of Vermejo phase sites. All three of these phases are defined on the basis of architectural remains that are likely to have been equally visible during archaeological survey. By itself, this indicates that the early Diversification period population of the Cimarron district likely exceeded the early Developmental period population. However, much of Glassow's survey area is located in portions of the landscape that appear to have been favored by later inhabitants. Similarly, data from the Vermejo district suggest that the Developmental period inhabitants of the southern Park Plateau may have favored higher-elevation localities. If cultural continuity between the Developmental and Diversification periods can be assumed, then it is also possible that the apparent increase in, and aggregation of, later populations was partly a product of significant shifts in settlement patterns. Given this possibility, as well as the potential for differential recognition of different architectural types, it is likely that it will be difficult to establish a demographic "profile" for this portion of the context area.

In purely theoretical terms, however, increased storage capacity either creates the conditions for, or is symptomatic of, demographic increase. If Diversification period households relied to a greater extent on domestic gardens, then it is at least possible that population increased. However, to the extent that such demographic choices are based on the perceived stability of the

available resource base, increased reliance on cultigens may not have stimulated population growth. Both Snow (1991) and Kirkpatrick and Ford (1977) observe that maize cultivation may have been relatively risky in north-central and northeastern New Mexico. These conclusions are supported by archaeological data as well as by modern climatic records (see also Cordell 1979).

Given the geographic limitations inherent in the database, particularly for the Trinidad and Vermejo districts, it is not now possible to determine whether the onset of the Sopris phase was accompanied by an increase in population. The differential visibility of later architectural types, the possibility of significant shifts in settlement patterns at the close of the Developmental period, and the uncertainties about the dietary role played by maize or other cultigens, prevent adequate resolution of this issue.

Community Organization. Both mortuary and architectural construction data support the inference that Sopris phase structures functioned as the residential bases of distinct households. Three basic interment patterns can be identified for the phase. Most burials (20 of 31 cases) were recovered from domestic contexts. Typically these consist of single, primary, flexed interments located beneath structure floors. Burials were frequently placed in prepared pits. Stratigraphic evidence indicates that the associated structures were inhabited after the interments were made.

Single, flexed, primary burials not directly associated with living spaces have also been reported (seven of 31). Some of these were recovered from the immediate vicinity of habitation sites, though others were located well away from permanent architecture. Because all of these burials were recovered by chance (either in archaeological backhoe trenches, or during the course of unrelated construction activities) it is difficult to evaluate the relative frequency of this type of burial. Given the structure-specific nature of many Sopris phase excavations, it is likely that this sort of interment was more common than available data might suggest.

Multiple human burials have also been recovered from a specially prepared mortuary pit (four of 31). Structure 5 at 5LA1416 consisted of a large pit containing a prominent central hearth, a low perimeter "bench," and five burial niches, one of which was empty. The central hearth appears to have received little use. Sherds from several of the burial niches, as well as from the fill of the pit, can be reconstructed into a portion of a single vessel, suggesting that the pit was intentionally backfilled over a relatively short period of time.

The clear association between human burials and living spaces argues for the importance of household-based lineage groups. A number of researchers have suggested that the context of interment of the dead has a relationship to the legitimization of control over, and access to, particular resources, including labor (Goldstein 1976). For the Sopris phase, the direct association of human remains with habitation structures suggests that descendants emphasized the biological and social continuity of the household by retaining "ownership" of the dead. On the other hand, the evidence for nondomestic interments argues for the existence of multiple social relationships.

As noted above, most Sopris phase structures were constructed in a series of discrete episodes. Typically, a single, large habitation room formed the nucleus of the structure. Later, other smaller storage and habitation rooms were added, or the primary room was partitioned. This pattern of episodic construction suggests a continuity of labor investment in particular facilities, and the maintenance through time of the social arrangements which those facilities supported. It also suggests that either the number of occupants residing in the structure or the per-occupant productivity of the household was increasing during the phase. Since most of the later rooms appear to be storage rooms the latter explanation seems more likely. Although the uselife of Sopris phase structures is not known, it is reasonable to conclude that the observed construction patterns reflect continuing investment in the facilities that sustained household activities.

Without question, significant problems are associated with the definition of prehistoric community organization, particularly in the absence of integrative architectural features or activity areas. Despite the lack of such structures in the Trinidad district, several lines of evidence suggest that Sopris phase households were organized into a dispersed rural community. As discussed above, chronometric data indicate that at least some of the structures in the district are archaeologically contemporaneous. Absolute contemporaneity is more difficult to establish, particularly without studies of use life and structure abandonment, although the relatively short duration of the phase implies that at least some of the structures were in use concurrently. The notion that some of these sites may have been occupied contemporaneously is also supported by the clustering of radiocarbon dates at the close of the tenth century and the opening of the eleventh century. Analysis of artifacts associated with these structures indicates that they were functionally equivalent, suggesting that most played a structurally equivalent role in the settlement system. Moreover, ceramic exchange data indicate that most households in the district participated in the Rio Grande trade system. Given the likelihood that such exchange was formalized (Mitchell 1998), it is reasonable to assume that it also entailed suprahousehold coordination, if not control.

Violence and Social Collapse. Although the data are meager, there are indications that conflict may have marked the end of the Sopris phase and contributed to the abandonment of the Trinidad district. At 5LA1418, the disarticulated bones of three individuals were found scattered throughout the fill of the masonry structure. At 5LA1416, one individual, in whose cervical vertebrae a projectile point was embedded, was interred above burned roof fall in an uncharacteristic extended position. Moreover, the majority of Sopris phase structures were destroyed by catastrophic fires.

Although the causes of this apparent conflict are not known, paleoenvironmental and human osteological data do not suggest that a significant population/resource imbalance characterized the twelfth century. On the other hand, ceramic evidence for rapid community transformation during this period (Mitchell 1997, 1998) does suggest that the suprahousehold community organization in the valley may have collapsed. General abandonment of the upper Purgatoire River valley appears to have occurred near the end of the twelfth century, followed during the thirteenth century by the abandonment of the Cimarron district.

Cultural Affiliation. Stratigraphic, chronometric, and assemblage attribute data indicate that the Sopris phase was most likely the continuation of an indigenous Developmental period sequence, and not of ancestral Pueblo demographic or political expansion during the Pueblo II period. A few researchers have also argued that the Sopris phase may be related to Athapaskan expansion into the Southwest (e.g. Schlesier 1994; Turner 1980). Although the timing of the Athapaskan migration is uncertain, Sopris phase material culture, settlement patterns, economic systems, and mortuary practices are foreshadowed in Developmental period data from the Park Plateau, again suggesting cultural continuity between about A.D. 200/500 and 1200/1300. Moreover, if the Sopris phase population of the Park Plateau was ancestral to the ethnographically known Jicarilla, as Schlesier (1994: 324ff) suggests, then the apparently unambiguous data indicating a two- or three-century abandonment of the southern Park Plateau must be explained.

Data are available, however, that provide several tentative insights into Sopris phase cultural affiliations. Probable construction dates for the masonry and adobe structures associated with the Sopris phase suggest that the intensive interaction network between the Trinidad district and the Taos district began during the eleventh century. This conclusion is supported by eleventh century dates for Taos Gray and Taos Black-on-white ceramics from the southern end of the plateau (Campbell 1984; Biella and Dorshow 1997a). Given that ancestral Pueblo groups appear to have arrived in the Taos district at that same time (Boyer et al. 1994), the nearly simultaneous appearance of trade wares on the eastern slope of the Sangre de Cristo Mountains suggests that the

well-documented ceramic exchange network of the late eleventh and early twelfth centuries may have been preceded by an earlier network. The content, intensity, or directionality of that earlier network is not known, however.

The pervasiveness and intensity of exchange in the 11th and 12th century across the Sangre de Cristo Mountains (Mitchell 1997, 1998) provides clues to the abandonment of the southern Park Plateau. This abandonment, and the collapse of the exchange network, appears to have occurred about the same time that large-scale, community aggregation became an important social process in the northern Rio Grande valley. The social relationships that were the basis for the Trinidad-Taos exchange may have been disrupted by the shifts in household size and composition that accompanied community aggregation. At the same time, Taos Pueblo origin accounts indicate that some of the members of that multicultural society originated on the Plains (Jeffrey L. Boyer, personal communication to Mark Mitchell, 1997; Ellis and Brody 1964; Wetherington 1968). Although meager, these data may imply that the symbiotic interaction that began between the Sopris phase inhabitants of the Park Plateau and the ancestral Pueblo inhabitants of the northern Rio Grande valley in the eleventh century culminated in the thirteenth century with the merger of those two formerly distinct groups (Albers 1993).

Technology

Considerably more information is available about Sopris phase technology. The most intensively studied artifact class is ceramics, owing no doubt to the chronological and cultural implications of particular wares and types. As noted above, the most distinctive element of Sopris phase artifact assemblages is Taos culinary wares. These generally consist of large (25-30 cm tall) incised ollas. The vessels tend to be narrowly globular in shape, with low, sloping shoulders and convex to flat or slightly concave bases. Rims are straight to slightly excurvate and undecorated. Shoulder and neck decoration consists of parallel rows of incised lines, vertical and horizontal rows of chevron-shaped punctations and, occasionally, obliterated wide fillets. The bases and lower bodies are generally undecorated, but frequently exhibit basket impressions. Some examples carry no decoration, although the vessel exterior is smoothed. Strap handles or solid lugs are frequently attached near the top of the decorated field.

In the culinary ware samples analyzed by Mitchell (1997), virtually all of the sherds identified as Taos Plain or Taos Incised on the basis of technological or stylistic attributes were compositionally similar to vessels recovered from the Taos district, and distinct from locally produced wares. Significantly, these sherds make up one-third to one-half of all sampled floor assemblages, indicating that ceramic exchange was both widespread and important. These data are also supported by petrographic analyses of sherds from the Vermejo district (Habicht-Mauche 1997), as well as general observations from the Cimarron district (Lutes 1959a, 1959b; Glassow 1980) and farther south along the eastern slope of the Sangre de Cristo Mountains (Gunnerson 1959).

Despite the clear importance of culinary wares manufactured in the Taos district, the Sopris phase ceramic assemblage is also notable for its diversity. Typical assemblages from structures include Taos Black-on-white bowls, polished bowls or jars, cord-marked jars, and locally manufactured jars, in addition to the ubiquitous Taos Plain or Taos Incised ollas. Some black-on-white sherds from Trinidad district contexts have been identified as Red Mesa, Kwahe'e, or Gallup. However, given the generally small and eroded nature of most sherds, these assignations should be treated with caution. Moreover, confusion surrounds the identification and dating of these types in the Rio Grande valley (Cordell 1979; Levine 1994; Mitchell 1997). Most cord-marked sherds have been identified as Stamper Cordmarked, an type attributed to the Optima focus of the Texas panhandle (Butler and Hoffman 1992). They also appear to be similar to

Borger Cordmarked, a related Antelope Creek type. However, evidence from Trinchera Cave indicates that at least some cord-marked sherds were manufactured in the Arkansas River Basin (Simpson 1976). Whether the cord-marked sherds from Sopris phase sites were produced locally is not known, although on the basis of macroscopic analysis they are dissimilar from Sopris Plain. It is possible that they were produced by Apishapa phase potters.

The origins of polished ceramics in the Trinidad district are unknown and no detailed analysis has been undertaken. Wood and Bair (1980:185) suggest that they were produced locally, although the limited compositional data reported by Mitchell (1997), as well as comparisons with sherds and vessels recovered from elsewhere in southeastern Colorado and from the Taos district, indicate that this is almost surely not the case. Although relatively few polished sherds have been recovered from Sopris phase sites, their occurrence tends to be concentrated, suggesting that they may have been used by a limited number of households. Several polished ware types have been noted among Sopris phase assemblages, including blind indented corrugated and smudged. As noted in an earlier discussion about Apishapa phase ceramics, various authors have observed similarities among polished wares recovered from Apishapa phase sites along the lower Purgatoire River and polished wares from Sopris phase sites (e.g., Hummer 1989:340; Wood and Bair 1980:184-185), suggesting contact and interaction between the two groups. Alternatively, polished ceramics may reflect a common connection with a more distant trading partner.

Locally produced wares do, however, make up a significant proportion of the total Sopris phase assemblage. Wood and Bair (1980) assert that it is extremely difficult to distinguish between Sopris Plain, a locally produced type, and Taos Plain, an imported type. This problem was also encountered by earlier investigators, and as a consequence, ceramic classifications for Trinidad district sites frequently include the terms "Sopris Plain/Taos Incised" or "Taos Incised (Local Manufacture)." However, technological, stylistic, and compositional analyses reported by Mitchell (1997) clearly demonstrate that the two types can in fact be reliably distinguished on the basis of their macroscopic properties. Locally produced vessels are generally smaller, and seldom contain incised decorative elements. When decoration is present, it consists of fingernail punctations and uneven parallel lines. These decorations are imitative of Taos designs but are executed with different tools and in a much more tentative fashion. Technologically, Sopris Plain is likely to have been constructed from self-tempered clays and fired in an oxidizing to neutral atmosphere. Temper particles consist of rounded grains as large as two or three millimeters in diameter; such particles are frequently visible on the vessel surface. Vessel walls tend to be thick (up to 10 mm). Most or all Sopris Plain vessels were manufactured by a paddle-and-anvil technique; anvil marks are frequently evident on interior surfaces. These locally produced vessels account for just under half of most structure floor assemblages.

The increase in the number and variety of ceramic vessels has important implications for Sopris phase economic and social practices. The use of ceramic vessels is generally associated with intensive resource processing. Pottery is necessary for effective bone-grease preparation and has been associated with an increase in maize utilization. Stiger (1998) also notes that various wild plant seeds cannot be consumed without thorough heating. The dramatic increase in the number of sherds associated with early Diversification period sites on the Park Plateau therefore implies that a wider range of resources may have been utilized, and that the available plant and animal resources both may have been exploited more intensively.

The diversity of the ceramic assemblage also has implications for Sopris phase social practices. That a very large percentage of the total sherd assemblage comes from imported vessels indicates that interregional exchange was an important element of Sopris phase society. Although trade with the Rio Grande valley was of primary importance, the presence of cord-marked sherds, occasionally comprising a substantial percentage of the total assemblage, indicates that at least

some Sopris phase households maintained contact with Southern Plains groups. This observation is supported by the recovery of several alternately beveled knives made from Alibates dolomite, material and artifact types closely associated with Antelope Creek communities in the middle Canadian River valley. The presence of polished wares in Sopris phase assemblages, as well as in other Diversification period assemblages from the Arkansas River Basin, may represent yet another vector of trade and interaction.

Much less attention has been focused on chipped stone artifacts from Sopris phase sites. Despite the lack of detailed analyses, several general observations may be made. Many chipped stone tools consist of unmodified or informally modified flakes struck from unprepared cores. Formally prepared bifaces make up a relatively small percentage of the total assemblage. The vast majority of both informal tools and unutilized flakes were made from locally available material. Argillite (hornfels or silicified shale) and basalt are abundant, both as secondary cobble deposits adjacent to the main stem and tributaries of the Purgatoire, and as primary deposits adjacent to basalt dikes and sills (McKibbin et al. 1997). Flake assemblages from habitation structures contain relatively few examples with cortex, suggesting that initial reduction took place at a more distant location.

Projectile point morphologies are highly variable. Most would generally be considered representative of the small, corner-notched to stemmed Scallorn variety, particularly examples with a large length-to-width ratio. Many of these points have three or more notches. Triangular, side-notched or square-stemmed Washita points are rare or entirely absent. Triangular, unnotched Fresno or Chaquaqua points (or bifaces) are relatively common, although fewer in number than Scallorn types. Larger dart points, generally of the Trinity or Ellis types, are also present in Sopris phase assemblages. It is unknown whether these represent the continued use of the atlatl or were scavenged and reused as knives. Such formal tools are disproportionately constructed from imported, higher-quality silicious material types. Alibates dolomite is moderately well represented, as is obsidian from several New Mexican sources (Shackley 1997). For the total chipped stone assemblage, somewhat larger percentages of unidentified quartzite and chert types are also present.

The ground stone tool assemblage contains a wide variety of morphological types. Metates can be grouped into three categories: slab metates that are normally thin, frequently unmodified, and lightly utilized; basin metates that are somewhat thicker, more formally patterned and often heavily utilized; and trough metates that are normally massive and intensively utilized, occasionally to exhaustion. Grinding surfaces vary from amorphous and flat on slab metates, to slightly or deeply concave on basin metates, to deep and rectangular on trough metates. Among these three types, slab and basin metates occur in roughly equal proportion, and trough metates are much less common. The two former types are functionally linked to the processing of wild seeds and plant parts, and the latter type is usually used for maize grinding. Material types include relatively soft sandstones to harder quartzites. A large percentage of the trough metates are made from vesicular basalt slabs, the porous structure of which aids in the preparation of maize kernels.

Mano types are similarly diverse. Morphology ranges from unmodified round to slightly oblong river cobbles which exhibit relatively little utilization, to long, rectangular, shaped slabs. Small, nearly circular to slightly oblong manos are the most common type. Many of the slightly larger manos, which have a length to width ratio of roughly 2:1, were intentionally shaped and utilized on both faces. The largest manos are typically thin slabs of schist with a length-to-width ratio of three or more to one. The latter variety are intentionally shaped and utilized on both faces. As with metates, smaller unprepared or "expedient" manos have been associated with the preparation of wild seeds, plant parts, meat, and pigments. Larger, and in particular longer manos have been linked to the preparation of maize meal. Taken together, these data suggest that

although wild floral resources may have comprised the bulk of Sopris phase diets, maize was also an important component.

Sopris phase sites also contain a rich bone and antler tool assemblage. Awls, generally made from the long bones of large mammals, are among the most common bone tool type. They vary in size and degree of finishing from small, sharp, carefully ground splinter awls, to large unprepared metapodial awls with relatively blunt tips. Bone shaft wrenches, antler tine flakers, and bone rasps and gouges have also been documented. Conspicuously absent are the scapula hoes and tibia digging sticks ordinarily associated with Southern Plains horticulturalists. Most bone tools were made from deer and cottontail bones, the two most common species represented in the entire faunal assemblage.

Bone, shell, and stone beads are also common components of the artifact assemblage. The most common types are tubular and round beads made from either cottontail long bones, or large bird bones. Shell beads cut from *Olivella*, a marine genus, have also been recovered, primarily from mortuary contexts. Necklaces made from cylindrical bone beads are also common grave goods. Lesser numbers of shell beads and pendants, frequently made from *Glycymeris,* have also been documented. Beads of these varieties have also been documented in early Diversification period contexts in the Cimarron district (Glassow 1980), in the Vermejo district (Brown and Brown 1997), as well as elsewhere in context area (Erdos 1998). Beads of these types are relatively rare in contemporaneous northern Rio Grande contexts (Green 1976; Mick-O'Hara 1994).

Settlement and Subsistence Strategies

Geographic Distribution of Sites. Information about the geographic extent and physiographic distribution of Sopris phase sites is limited by land ownership patterns on the Park Plateau. However, sites that contain either rectilinear stone masonry architecture or Taos culinary or decorated ceramics are widely distributed across the southern half of the plateau. In the Trinidad district, Sopris phase manifestations are best known from ACOE property around Trinidad Lake. However, probable Sopris phase habitation sites have been documented along tributaries of the Purgatoire River and in the uplands away from the stream (e.g., McKibbin et al. 1997). Sopris phase sites are also known to exist east of Trinidad, on the eastern side of Raton Mesa. Baker (1964, 1965) and Campbell (1969a) note several such sites on both sides of Raton Pass. In the Vermejo district, Campbell (1984) reports on Sopris phase habitation structures (see also Kershner 1984). Several large, Sopris phase hamlets have also been observed in the district (Wetherbee Dorshow, personal communication to Mark Mitchell, 1998).

In the Cimarron district, Glassow (1980, 1984) defined several phases that span the early Diversification period. In particular, the Ponil phase, and perhaps portions of the Cimarron phase, have very close artifactual and architectural similarities with the Sopris phase. The single, excavated Ponil phase structure (NP-1/Area 2) (Lutes 1959a, 1959b) easily fits within the range of variation of the better known Sopris phase structures in the Trinidad district. The structure also contained a comparable lithic, bone, and ceramic assemblage. In addition, rockshelters containing Sopris phase artifact assemblages have been excavated in the district (Bogan 1941; Skinner 1964). The succeeding Cimarron phase, dated on the basis of ceramic cross-dates to the century between A.D. 1200 and 1300, was a continuation of architectural and artifactual patterns established during the Ponil phase (Glassow 1980; Gunnerson 1987). In particular, Cimarron phase architectural forms and ceramic assemblages correspond to those of the Sopris phase, although the presence of Santa Fe Black-on-white and corrugated culinary wares suggests that at least a portion of the Cimarron phase postdates the Sopris phase in the Trinidad district.

Finally, Gunnerson (1959) alludes to the presence of sites with similar ceramic assemblages south of the Park Plateau along the eastern slope of the Sangre de Cristo Mountains from Las Vegas, New Mexico north through the Mora River valley. So little information is available about these sites that the cultural relationships between them and those of the Park Plateau are uncertain.

Given the close correspondence between Ponil phase sites in the Cimarron district and Sopris phase sites in the Trinidad district, it is reasonable to extend the boundary of the Sopris phase to include sites of the early to middle Diversification period in the Vermejo and Cimarron districts. Although it may be the case that the Ponil phase type site is not generally representative of unexcavated Ponil phase sites, it is more likely that the Ponil and Sopris phases are coincident cultural constructs. Because the Sopris phase is more completely defined, and is better dated, it is more broadly applicable than the Ponil phase. Taken together, these data indicate that the Sopris phase was a widespread and persistent cultural phenomenon. Between approximately A.D. 1050 and 1200 or 1300, residents of the eastern slope of the Sangre de Cristo Mountains pursued a dual economic strategy that emphasized both hunting/gathering and gardening, and maintained intensive social and economic contacts with ancestral Puebloans living in the northern Rio Grande valley.

Site Types and Locational Variability. The most extensive study of settlement patterns of the early Diversification period has been conducted in the Cimarron district. Using data collected from the Vermejo, Ponil, and Cimarron drainage basins, Glassow (1980) proposes that settlement on the southern Park Plateau shifted toward lower elevations at the close of the Developmental period and the opening of the Diversification period. He argues that Ponil and Cimarron phase habitation sites are located closer to alluvial bottom lands where simple, garden irrigation might have been practiced. This general trend intensified through time: the locations of later sites tend to be more strongly correlated with the locations of side canyons and alluvial terraces (Glassow 1980:103). Glassow suggests that these locations are more favorable for *akchin* fields, which take advantage of subsurface water drainage patterns, as well as for simple irrigation works.

These conclusions are supported in a general way by evidence from the Vermejo district. The upland terrain which dominates that district appears to have been used more intensively by Developmental period groups (Biella and Dorshow 1997a). Although several components from the early Diversification period have been identified there, most consist of rockshelter occupations without substantial architecture. One excavated Sopris phase site within the Vermejo district is located on a low bench immediately above the main stem of the Vermejo River (Campbell 1984:454). The conclusion that later sites tend to be located at lower elevations within major drainages is also confirmed by more recent investigations, which indicate that the uplands were less heavily used during the Diversification period (Wetherbee Dorshow, personal communication to Mark Mitchell, 1998).

Data regarding settlement location from the Trinidad district are more meager. The geographically concentrated nature of archaeological research conducted in the valley provides a limited view of the distribution of habitation sites. Despite this problem, several block surveys conducted in the uplands have generally not located the stone masonry structures characteristic of the Sopris phase. These projects have, however, encountered abundant evidence that the uplands were heavily utilized for resource procurement and processing activities. It is reasonable, therefore, to conclude that habitation sites of the early Diversification period tend to be located at lower elevations and nearer to major drainages. Among identified habitation sites, most are located in open settings, including terraces and low benches, adjacent to the Purgatoire River and its principal tributaries. On the other hand, several known habitation sites are located on rocky promontories well away from what would ordinarily be considered arable land. Whether this was

the result of a shift in settlement location is not known, particularly given that Developmental period habitation sites in the Trinidad district appear to consist primarily of shallow house pits with little modern surface expression.

Relatively little is known about the functional variability of Sopris phase sites. The survey-level site recognition criteria discussed above tend to emphasize habitation sites at the expense of other site types and are therefore unlikely to reveal the full range of functional or morphological site types. Although several nonarchitectural sites have been assigned to the Sopris phase on the basis of projectile point morphology, no detailed chipped stone analysis has been undertaken in the district (Indeck and Legard 1984; Lutz and Hunt 1979; Tucker 1983). Still, a large number of chipped and ground stone scatters have been recorded on terraces adjacent to the Purgatoire River (Blair 1980; Dore 1993; Gleichman 1983; Hand et al. 1977; Indeck and Legard 1984; McKibbin et al. 1997), as well as in the uplands away from the river corridor (Lutz and Hunt 1979; Rood and Church 1989; Tucker 1983).

Unfortunately, most of the sites identified in these investigations cannot be assigned to a particular temporal period. Lutz and Hunt (1979:187) observe that chronological control is "extremely weak," and as a consequence were unable to determine which among the many sites they recorded might be attributable to the Sopris phase. Similarly, Tucker (1983) indicates that only 5 percent of the 132 prehistoric components identified for the Raton Basin project could be assigned to either the Developmental or Diversification period, and that only 14 percent of the sites could be attributed to any temporal period. Similar results were obtained by McKibbin et al. (1997). Despite this lack of chronological control, it is nevertheless clear that the uplands as well as the main river corridors of the southern Park Plateau were intensively and extensively utilized by various prehistoric groups.

Several researchers have offered a variety of schemes to classify site types. Using a model derived from Great Basin ethnography and ethnohistory, Lutz and Hunt (1979) distinguish between "short-term specialized activity areas" and "base camps." They subdivide these categories into four types on the basis of site size, assemblage characteristics, and environmental factors. The detailed nature of this model can be evaluated against the data gathered by McKibbin et al. (1997). A site diversity analysis conducted for upland and terrace sites located in the Lorencito drainage basin suggests that these sites were utilized for a variety of tasks through time (McKibbin et al. 1997). Given the likelihood of multiple occupations at these sites, a functional system of site classification such as that proposed by Lutz and Hunt (1979) may be difficult to implement. Additional chronological control will be required to determine which among the many recorded chipped and ground stone scatters in the valley represent Sopris phase limited activity loci. In any case, it is likely that residential sites formed one element of a larger settlement network that included a range of morphological and function site types. Additional excavation data from temporary field camps, such as rockshelters, may help clarify the structure of the Sopris phase settlement system.

Among Sopris phase habitation sites, two morphological types have been identified. A homestead, which consists of single, habitation structures and associated features, is more common and occurs in a wider variety of topographic settings. The second type, termed "hamlet," contains multiple archaeologically contemporaneous habitation structures and tends to be confined to locations on or immediately adjacent to permanent water courses. Sites of the latter type are sometimes referred to as "villages." Insufficient data are available to determine whether homesteads and hamlets represent similar functional types. It may be that some of the "homesteads" actually functioned as field houses. The relative paucity of the artifact assemblage associated with this type of structure might support this idea, although it may also be that homesteads were simply occupied for shorter periods of time. Additional analysis of assemblages

will be required to determine the functional differences, if any, between these two types of architectural sites.

Economy. Like many other Diversification period communities in the Arkansas and Canadian River basins, the Sopris phase inhabitants of the Park Plateau practiced a dual subsistence strategy. Both direct and indirect evidence suggests that hunting, gathering, and maize horticulture were important components of the economy. Maize remains, including kernels that appear to have been dried for storage, cobs, and cupules have been recovered from hearths, storage pits, and surface structures at most, but not all, Sopris phase sites (Ireland 1970, 1974a, 1974b; Mitchell 1997; Puseman 1997). Domesticated beans have also been recovered from 5LA1416 (Puseman 1997). Squash seeds have been recovered from an early Diversification period context in at least one rockshelter in the Cimarron district (Bogan 1941). Similar results have been obtained from macrobotanical studies conducted on the southern end of the plateau for both Developmental (Kirkpatrick and Ford 1977) and early Diversification period contexts (Toll 1988).

Wild plant resources were also important. Edible portions of numerous native plant species, including weedy annuals such as goosefoot, amaranth, purslane, and sunflower; grasses, and in particular Indian ricegrass; cacti (prickly pear, hedgehog); yucca; shrubs (chokecherry, bitterbrush, skunkbrush); and trees (juniper, pine) have been identified at archaeological sites in both the Cimarron and Trinidad districts. Variable sample collection and preparation procedures make comparisons difficult, although goosefoot has been identified as one of the most important wild plant resources in the region (Gleichman 1992; Van Ness 1988).

The storage of both wild and cultivated plant resources was an important component of Sopris phase economic strategies. All excavated Sopris phase structures, with the exception of those built directly on bedrock, contain both interior and exterior storage pits. At least some above-ground rooms attached to habitation structures may also have functioned as storage facilities. The large volume of storage space associated with sites suggests that surplus production may have been significant. The management and allocation of this surplus probably had important consequences for organizational strategies. Interestingly, a comparison of macrobotanical data sets from several sites indicates that domestic crop production may not have been equally important for all households. Extensive water-screening of samples from the structural fill at 5LA1425 failed to recover maize remains (Ireland 1974a), although such remains were widely distributed among structures and features at 5LA1416 (Puseman 1997). This disparity may indicate that different economic choices were made by individual households.

Artifact data also provide indirect evidence for the composition of Sopris phase diets. For example, the abundance of projectile points at Sopris phase sites indicates, at least in a general way, that hunting was an important component of the economy. More than 500 projectile points were recovered from the excavation of Structure 3 at 5LA1416. By comparison, just 13 projectile points were recovered from two contemporaneous pithouses in the Taos district (Moore 1994). Preliminary analyses of faunal remains associated with 11 structures have been undertaken. These studies reveal that both large and small game animals are represented in the faunal assemblage. Dominant species include deer and cottontail rabbits, although bison, pronghorn, beaver, badger, and jack rabbit were also exploited. A variety of carnivores has also been identified, including bobcat, mountain lion, coyote, and bear. Birds, including eagle, hawk, crane, and owl, were utilized, although wild turkey is relatively uncommon. By comparison, several contemporaneous pithouse sites in the Taos district contained more limited faunal assemblages dominated by small mammals, turkeys, and in limited quantities, deer (Mick-O'Hara 1994).

Preliminary analysis of ground stone indicates that both large and small manos, as well as slab, basin, and trough metates occur at Sopris phase sites. The characteristics of this assemblage

suggest that throughout the Sopris phase, the processing of native plant species was important, and further, that maize processing is also significant. As noted above, the large and well-preserved bone tool assemblage does not include the scapula hoes or tibia digging sticks so characteristic of Southern Plains Village economies.

Finally, a recent osteological analysis of human remains from the Trinidad district provides additional indirect clues to the composition of Sopris phase diets. Karhu (1995:23) argues that the frequencies of dental hypoplasias, cribra orbitalia, and porotic hyperostosis among Sopris phase individuals contrast with the frequencies of those conditions observed among individuals from large, maize-dependent communities. The degree to which these conditions can be considered proxies for horticultural dependency is uncertain, however (Stuart-Macadam 1992; Holland and O'Brien 1997). It may be the case that low to moderate levels of porotic hyperostosis reflect a semisedentary, residential pattern rather than low levels of maize dependency, although diet may have been an important factor as well.

Architecture. Sopris phase architecture is morphologically variable. At 5LA1416, for example, excavations have uncovered the remains of horizontally laid, plastered stone masonry structures; an adobe structure; and several jacal structures of various configurations. 5LA1416 also contained at least one shallow house pit with a sloping ramp entryway. A similar range of architectural types has been observed at other sites in the Trinidad district.

Among these architectural forms, house pits are the most enigmatic. As discussed previously, radiocarbon and archaeomagnetic dates suggest that at least some of these features predate the Sopris phase; others appear to have been occupied during the Sopris phase (e.g., 5LA1424, Feature B [Ireland 1974b]). Their extreme heterogeneity makes characterization difficult. Some contain collared hearths and storage pits, and others do not. Two appear to have had ramp entryways. Some are little more than single- or multiroom amorphous pits without lined or prepared hearths. Little information is available about the superstructures of these buildings. Still, despite this heterogeneity, it is clear that none resembles what might be considered typical ancestral Pueblo pit structures. Trinidad district house pits are smaller and shallower, and lack ventilator shafts, wing walls, deflectors, benches, or pilasters. Given that house pits in the Trinidad district have no obvious surface manifestations, their frequency or range of morphological variation is not known.

Other Trinidad district architectural features, all of which have been attributed to the Sopris phase proper, are somewhat more patterned. The modal architectural type is a rectangular or subrectangular, multiroom surface structure, constructed from heavily mortared, horizontally laid stone slabs or blocks (see Figure 7-3). Frequently, other types of construction materials, including vertical stone slabs, jacal, and adobe, were also used. In at least one case an entire structure was constructed from adobe, although the precise method of its construction is not known. Individual structures range from two to 10 or 15 rooms in size, although most structures contain two to four rooms. Roofs were massively constructed from a log-and-pole lattice, and at least some interior walls were plastered. Floor features include collared hearths, ash pits, and bell-shaped storage pits. Subfloor human interments are also common among the larger structures.

Many of these buildings were constructed in a series of discrete episodes. Most began as a single large room, to which other smaller rooms were later added. Individual rooms vary in size from more than 40 m^2 to less than 2 m^2. Room functions were variable; the largest generally contain the typical suite of floor features including hearths and storage pits; such features, however, are also sometimes found in smaller rooms. At some sites, extended walls or "fences" formed small plazas or communal work areas. Nonarchitectural features, including post alignments, storage pits, and fire pits, are common outside these structures. Some of the bell-

shaped extramural storage features were very large, measuring more than 1 m deep and 1.5 m in diameter at the base.

A number of smaller, circular jacal structures have also been excavated. These consist of a shallow basin over which a waddle-and-daub superstructure was constructed. Some contained collared hearths similar to the larger masonry and adobe structures, although associated storage features appear to have been smaller and less numerous. Additional storage rooms appear not to have been added to these structures.

The available chronometric data are insufficiently fine grained to establish an architectural type sequence for the district. Wood and Bair (1980) proposed that the Initial Sopris subphase was characterized by the construction of pithouses, jacal surface structures, and "campsites"; the Early Sopris subphase by jacal and adobe structures; and the Late Sopris subphase by masonry structures. The data presented here indicate that all of these structural types, with the exception of some house pits, are at least archaeologically, if not precisely, contemporaneous (see also Lutes 1959a, 1959b). In at least one instance, portions of an adobe wall were documented beneath a masonry room; however, the inference that masonry structures, as a type, postdate adobe structures is not supported by radiocarbon dates. In addition, extra-architectural storage or roasting features cannot be seriated into a type sequence. Bell-shaped pits, many of them large, appear to have been associated with both the Developmental and early Diversification periods.

The chronological data presented above indicate that architectural variability among structures in the district is not the product of temporal differences and, furthermore, it is unclear to what this variability should be attributed. Whether interstructural variability reflects functional distinctions or was the result of social differences among the inhabitants is not known. Although assemblage inventories suggest that many of the structures were functionally equivalent (Wood and Bair 1980:227), it is possible that the largest multiroom structures functioned in part as community (not necessarily communal) storage facilities. The ratio of "storage" to "habitation" rooms, as defined by the presence or absence of hearths, approaches 1:3 and 1:4.5 among the largest structures (Structure 1 at 5LA1416 and Structure 3 at 5LA1211, respectively). Alternatively, at least some of the smaller, single-structure sites may have functioned as field houses. However, differences in assemblage size and diversity between the largest and smallest structures may simply reflect duration of residency, rather than functional differences.

There is also evidence that, in at least some cases, the differences between structures may have been related to social factors. Differences in the frequencies of various imported ceramic vessels may indicate that individual households formed exchange partnerships with households or communities in different regions (Mitchell 1997, 1998). These differences may reflect shifting social identities within the Sopris phase community in the Trinidad district, and ultimately the "creolization" of some households (Lightfoot and Martinez 1995). Variations in the size and storage capacity of individual structures may also be a reflection of heterogeneous social roles, and specifically of the degree to which individual households were able to mobilize communal labor.

Directions for Future Research

Chronology

Firm temporal boundaries for the Diversification period need to be established. Cultural attributes that distinguish the Diversification period from the preceding Developmental period and the subsequent Protohistoric period may be more explicitly defined through additional associations of chronometric dates and archaeological assemblages. Further, it is imperative that attempts be

made to assess materials from a full range of morphological and functional site types in defining occupation of the Diversification period (see below). Past investigations have emphasized larger architectural sites in such definitions.

- What attributes, or combinations thereof, form the "hallmarks" or primary determinants of Diversification period occupation in the context area?

- At what time and in what geographical area did occupation attributable to the Diversification period first become evident? Similarly, what and where is the final manifestation of the Diversification period?

Temporal and cultural relationships between and among Apishapa and Sopris phase occupations require elucidation. Comparison of attributes has not been emphasized in interpreting this segment of prehistory, despite the common origin and proximity of the Sopris and Apishapa phases. Such a comparison would currently be limited primarily by the meager data associated with early Diversification period components. A number of research questions need to be addressed as additional data become available.

- Does the Sopris phase begin and end earlier than the Apishapa phase?

- What is the extent of regional variation in the temporal ranges of these two phases, e.g., are the dates for the Sopris phase identical in both the Arkansas River Basin and northeastern New Mexico?

- Are dates for the Apishapa phase occupation of the Purgatoire River area earlier than those associated with Apishapa phase components north of the Arkansas River?

- Are both the Sopris and Apishapa phases essentially contemporaneous, Southern Plains manifestations developing from a common origin that differ largely in their adoption of diffused traits?

- Are occupations during the early Diversification period characterized by mixtures of Apishapa and Sopris phase attributes?

- Does Apishapa and Sopris phase rock art suggest a common origin?

Population Dynamics

Considerable portions of the context area remain largely unknown archaeologically, and the extent of occupation during the Diversification period is not firmly established. Current data suggest that occupation does not spill over into the Denver Basin north of the Palmer Divide. The northernmost architectural sites attributed to the Apishapa phase are located just south of Colorado Springs. However, expanses of the context area east of Colorado Springs and south to the Arkansas River are poorly known. Similarly, the southern and western edges of Diversification period occupation in northeastern New Mexico and along the foothills of the Rocky Mountains are only vaguely defined.

- Is there evidence of large-scale Apishapa or Sopris phase occupation in the Canadian and Cimarron river drainages of northeastern New Mexico?

- How far west in the Arkansas, Huerfano, Cucharas, and Apishapa drainage basins does Apishapa phase occupation extend?

- How far west in the upper Purgatoire River drainage does Sopris phase occupation extend?

It remains to be confirmed whether all occupation of the Diversification period in the Arkansas River Basin is related to either the Apishapa or Sopris phase. More data are necessary to determine if distinctions seen among context-area sites are the result of variability within Apishapa and Sopris phase settlement, or the presence of additional, unrelated hunter-gatherer groups.

- Did groups entirely unrelated to either the Apishapa or Sopris phase inhabit the Arkansas River Basin and/or southern Park Plateau during the Diversification period?

- Are spaced stone circles or "tipi rings" and boulder foundation structures evidence that other culture groups inhabited the context area during the Diversification period?

Inter- and intraregional relationships among Diversification period populations require further definition. Although connections between Rio Grande pueblos and Sopris phase populations are well established, Apishapa phase interaction with other groups including those of the Sopris phase is poorly understood. Furthermore, little is known of the degree of contact among settlements within each of the phases.

- What is the evidence for interaction among Sopris and Apishapa phase populations?

- Is there evidence for Apishapa phase interaction with Upper Republican groups as well as Antelope Creek phase populations; if so, does the Upper Canark Regional Variant concept as currently defined remain viable in light of such evidence?

- What is the evidence for intersettlement trade and alliances within the Apishapa and Sopris phases?

- Is there rock art evidence suggesting the delineation of cultural boundaries?

The purported population increase during the Diversification period requires further investigation. Although the visibility of architectural sites has been cited as a possible factor in the large proportion of sites assigned to this segment of prehistory, the situation may also be attributable to a general increase in population. Alternatively, it is speculated that population numbers may have remained stable but groups became increasingly aggregated or concentrated in specific areas during parts of the year. Thus, population density patterns rather than overall population volume may have changed during the Diversification period.

- Are the largest architectural sites of the Diversification period later than those with fewer rooms and/or structures?

- Are all site types, not just those with architecture, more prevalent in the Diversification period?

- Do large numbers of Diversification period sites tend to be restricted to relatively small portions of the overall context area?

- Are Diversification period occupations in stratified, multicomponent rockshelters more often characterized by assemblages suggestive of larger populations?

Considerable research is required to elucidate matters pertaining to the abandonment of the context area by Diversification period populations. Widely ranging factors, most of which are interrelated, have been offered as possible explanations for the abandonment of the context area during the fourteenth and early fifteenth centuries. Possible catalysts include deteriorating climatic conditions, isolation, increasing competition for limited resources, warfare, population incursions, and assorted combinations thereof. Of these, debate is most often centered around the arrival of Athapaskan groups and the drought conditions that so dramatically affected the Southwest in the thirteenth century.

- Was abandonment during the Diversification period gradual or sudden, and how did this process vary regionally?
- What is the evidence for interaction among Diversification period and Athapaskan populations, and did this include warfare?
- What is the evidence for interaction among Apishapa and Sopris phase populations, and did this include warfare?
- Do the so-called Apishapa phase forts, purportedly built for defensive purposes, actually represent sacred precincts or elite residences?
- Does archaeological and/or ethnographic evidence suggest that Apishapa populations dispersed to regions east of the context area?

Technology

Lithic technological emphases of the Diversification period need to be identified and subsequently compared with those of surrounding regions and other cultural taxa of the context area. It is reiterated that baseline production and use strategies should be identified for the Diversification period in addition to patterned diagnostic tools. Debitage analyses including quantifiable measures such as size grading and tool analyses that incorporate a number of well-defined morphological variables facilitate such technological assessments. Behavioral aspects of lithic technology that facilitate the discernment of changing sedentism and mobility patterns have only recently been addressed for the Diversification period. The large samples often associated with sites of this time offer expanded opportunities for such research. The following questions should merely be considered examples given the myriad avenues of research applicable to this topic.

- Does the emphasis on unmodified or minimally modified flake tools and bifaces apply to all Diversification period sites?
- Does the relative proportion of expedient to formal tools differ from the preceding Developmental period?
- Do lithic assemblages of the Diversification period exhibit fewer patterned tools than, for example, Antelope Creek phase villages to the east?
- What is the evidence for regional variation in context-area raw material availability and how does this affect lithic technology?
- Does the relative proportion of expedient to formal tools vary according to site type in the Diversification period?

- Are all architectural sites of the Diversification period characterized by assemblages oriented specifically toward late stage reduction and tool refurbishment?

- Which site types of the Diversification period show evidence of early and middle-stage biface production perhaps representative of "gearing up" for seasonal rounds?

Comparison of Apishapa and Sopris phase technologies as well as regional variation among both should be stressed in future research. Sites of the two prominent phases of the Diversification period are often situated in proximity to one another and are hypothesized to have a common origin within a long-standing hunter-gatherer tradition. However, as has been noted elsewhere, rigorous comparison of Apishapa and Sopris phases has been lacking. The larger artifact samples associated with these sites offer ideal opportunities to assess technological relationships (or lack thereof). In particular, the ceramic assemblages recovered from Apishapa and Sopris phase sites warrant further attention. The same comparisons may be applied to regional variation within each of the phases, e.g., technological differences between the Apishapa phase occupations along the Purgatoire River and those north of the Arkansas River have yet to be addressed.

- How do the polished and cord-marked wares recovered from Apishapa and Sopris phase occupations compare; are they manufactured locally, and are they indicative of trade/interaction among the two phases?

- Are Southwestern trade wares more pervasive among Apishapa phase occupations south of the Arkansas river; alternatively, are cord-marked wares imported from Plains Village contexts more prevalent among Apishapa phase occupations along Turkey Creek?

- What are the implications of projectile point differences exhibited by Apishapa and Sopris phase occupations, e.g., are the side-notched Reed/Washita points more likely to be associated with Apishapa phase bison procurement?

- Are small, corner-notched points (e.g., the Scallorn type) relatively more prevalent among Sopris phase occupations in the Purgatoire River region than in other portions of the context area?

- Do Apishapa and Sopris phase occupations share common clay and/or chipped stone sources?

- Are Sopris phase ground stone assemblages characterized by more formally patterned tools and greater time invested in their manufacture than those of the Apishapa phase?

- How do Apishapa and Sopris phase bone and shell tools and ornaments compare?

- Do the formal bone tools found in Apishapa and Sopris contexts have precedents in the Developmental period?

Aspects of Diversification period technology indicative of interregional and intersettlement relationships should be further explored. Several interesting research directions are applicable to this wide-ranging topic. Particularly important are data that may elucidate matters related to the question of Apishapa phase isolationism and Sopris phase interaction (or lack thereof) with regions other than that of the Rio Grande pueblos. Additional source analyses for ceramics, shell, and lithic artifacts are crucial for resolving the following questions. Furthermore, research in the context area has reached a point where sufficient data have

accumulated to identify previous collections that may facilitate current examinations of specific topics. For example, Southwestern corrugated ceramics are relatively rare occurrences among Diversification period occupations. Two such occurrences are reported from the excavations at the Avery Ranch site in the 1960s and the Ocean Vista site in the 1980s. These are roughly contemporaneous sites located in proximity to one another. A detailed comparison of the corrugated sherds from the two sites by a single ceramicist may provide important insight into relationships between the two sites and trade with the Southwest. Such reanalysis of combined collections may facilitate addressing some of the questions presented here.

- Which cord-marked, polished, and plain wares recovered from Diversification period occupations reflect local manufacture; which cord-marked wares are trade items?

- Does all obsidian associated with Diversification period occupation originate from northern New Mexico sources?

- How widely distributed is the Alibates dolomite from the Texas panhandle, and is it more likely associated with the Diversification period rather than Developmental period; is it more likely associated with the Apishapa phase than the Sopris phase?

- Does shell from exotic sources tend to be associated more often with Sopris rather than Apishapa phase occupations?

Settlement and Subsistence Strategies

Future research efforts should focus on determining the full range of variability of Diversification period site types. Although past Diversification period research has generally emphasized large architectural sites and rockshelters, recent investigations indicate that the taxon encompasses considerable variability in site types that is suggestive of a wide functional range. However, the extent of this variability and its ultimate implications for settlement patterns have yet to be adequately explored. Architecture, for example, was not built solely for large residential bases; a number of isolated, single structures are also known. Architectural sites and rockshelters appear to encompass a wide range of functions during the Diversification period. Although little is known of the function of open, nonarchitectural sites, these too exhibit considerable variability in size and in feature and artifact composition. Overall, it is most important to conceptualize Late Prehistoric settlement in general, and Diversification period settlement in particular, as dynamic; settlement patterns undoubtedly changed through time in response to environmental and cultural factors. Therefore, this topic is inextricably tied to chronology. Much of the site type data presently available have been acquired through survey, and this information is therefore limited in its utility for assessing more precisely site functions and temporal variability. Although additional survey is important, excavation data will greatly facilitate resolution of many of the questions presented below.

- Is there evidence that both Sopris and Apishapa settlement systems conform to the collector strategy proposed by Binford (1980), or is there a better model?

- Do Apishapa and Sopris phase settlement systems include architectural sites representative of both limited-activity field houses and residential bases where a number of tasks were completed?

- What are the various functions of rockshelters in the Diversification period settlement system; are there rockshelters that represent relatively long term residential bases?

- What is the functional range of open nonarchitectural sites?

- Do lithic procurement and manufacturing sites of the Diversification period generally include materials suggesting that other domestic tasks (e.g., plant processing) were accomplished at these locales in conjunction with the stone tool production?

- Does early and middle-stage lithic production ever occur at Diversification period residential bases?

The range of feature morphology and function and correlations between specific feature types and site types of the Diversification period needs to be more fully investigated. Research oriented toward features that are directly related to the construction of architecture or situated within structures is discussed in a subsequent section. Narrative presented here is largely concerned with nonarchitectural features such as rock art, hearths, roasting pits, human interments, and storage facilities. Again, the paucity of excavation data has restricted studies pertaining to this topic; much of the more detailed information about feature morphology is derived from the larger architectural sites.

- Are exterior, fire-related and storage features at Sopris phase sites more formally constructed than those associated with Apishapa phase sites?

- Are the large concentrations of fire-cracked rock and ash often recorded as roasting pits associated with Diversification period sites; what is their specific function(s), and are they more prevalent among Apishapa phase contexts than those of the Sopris phase?

- How does feature morphology vary among architectural sites, rockshelters, and open nonarchitectural sites?

- What is the evidence for Apishapa phase burials, and where are they found in relation to architectural residential bases?

- Does feature morphology vary on a regional basis in the Apishapa and Sopris phases, e.g., do Sopris phase occupations in the southern Park Plateau have a greater range of feature types than those in the Trinidad district?

- What is the morphological range of storage features in the Diversification period, and how do such features vary according to phase and/or region?

- How does feature morphology in the Diversification period correlate with specific subsistence items?

- Is Diversification period rock art distinguishable from earlier and later examples, and how does Apishapa phase rock art compare or contrast with that of the Sopris phase?

Past studies of settlement in the Diversification period, particularly those concerned with the distribution of Apishapa phase architectural sites, have emphasized canyon settings. Although the so-called defensive positions of Apishapa phase sites have been prominently featured in descriptions of Diversification period settlement, the largely contemporaneous Sopris phase is generally not associated with defensive canyon settings. In actuality, the term "canyon setting" encompasses a wide array of environmental niches in the context area, and Diversification period sites are distributed throughout. Furthermore, recent investigations have

revealed the presence of both architectural and nonarchitectural sites located at some distance from canyon incisions.

- Is there a dichotomy in the subsistence orientation of Apishapa phase residential bases located in shallow as opposed to deep canyon settings, e.g., are bison remains more strongly associated with the shallow canyon sites with easier access to broad expanses of open plains?

- Do field camps of the Diversification period extend into higher elevation, foothill locales?

- Do open nonarchitectural sites tend to be more widely distributed through a range of environmental settings than architectural residential bases?

Much remains to be learned about regional, temporal, and phase-level variation in the role and distribution of cultigens during the Diversification period. Although domesticated beans are currently known only in Sopris phase components, maize was widely distributed through the context area and the Park Plateau of northeastern New Mexico. However, currently available data suggest that its importance in the overall subsistence strategy of populations during the Diversification period may have differed according to region and perhaps phase. As with variability in site types, this facet of settlement-subsistence strategy during the Diversification period is presumed to have a temporal component; the role and distribution of maize probably changed through time.

- Was maize more prevalent among Sopris phase than Apishapa phase occupations?

- Were domesticated beans associated only with the Sopris phase?

- Is there a correlation between elevation of sites and quantity of maize remains?

- Is maize most abundant in southern Park Plateau sites in comparison with the greater context area?

- Was maize distributed through the context area by trade and/or a seed exchange system?

- What is the evidence for maize storage, and does it vary according to phase and/or region?

- Is maize more prevalent in occupations of the Diversification period than in those of the preceding Transitional phase; does use of maize increase over the course of the Diversification period?

Temporal, regional, and phase-level variation in the diversity and role of wild plants in the subsistence strategy of Diversification period sites requires additional investigation. Weedy annuals, particularly charred goosefoot seeds, appear to have been the preferred subsistence item among Diversification period populations. However, little is known about regional and phase-level differences in wild plant use. Furthermore, the influence of preservation factors in standard botanical analyses must ultimately be addressed. Preservation conditions vary considerably according to site-specific environments, and in most situations, fleshy plant parts do not preserve as well as charred seeds. Although largely untested, protein residue analysis may provide important data that supplement micro- and macrobotanical studies.

- Is the prevalence of goosefoot in components of the Diversification period due to preservation rather cultural factors?

- Is goosefoot more conducive than other weedy annuals to rudimentary horticulture in a variety of environmental settings?

- What is the evidence for regional and temporal variation in wild plant procurement during the Diversification period?

- What are the differences, if any, between Apishapa and Sopris phase wild plant utilization?

- What evidence exists for wild plant storage; what is the range of wild plant storage facilities and do such features vary according to phase and/or region?

Faunal assemblages from the Diversification period require additional study as well. A mixture of small mammal and medium to large artiodactyl procurement continued to be pervasive during the Diversification period, although a wide range of ancillary foods such as freshwater mussels obviously supplemented the diet. Emphases on particular types of animals vary considerably by site. Overall, leporids and deer appear to be the most commonly occurring faunal remains, but certain large, architectural settlements of the Apishapa phase are evidently more strongly oriented toward bison procurement and processing. Whether the variation reflects regional, seasonal, or temporal factors, or some sort of combination thereof, awaits further examination.

- Are the large Apishapa architectural sites located in shallow or tributary canyon settings oriented toward seasonal bison procurement and processing?

- Do the bison-oriented components tend to be associated with a specific temporal range within the Diversification period, and are they restricted to regions north of the Purgatoire River?

- Do rockshelters, regardless of phase association, tend to be more often associated with small mammal and leporid procurement?

- Is there evidence for Sopris phase bison procurement?

- What is the evidence, if any, for regional variation in faunal procurement during the Diversification period, e.g., are the faunal remains associated with components south of the Purgatoire River more or less the same as those north of the Arkansas River?

Comparison of architectural styles of the Diversification period with those of the preceding Developmental period is necessary. Such comparison is inhibited by the lack of Developmental period architecture from the larger context area; most examples are known from the southern Park Plateau region of northeastern New Mexico. The rudimentary, basin house form was present during the Developmental period as well as the Apishapa and Sopris phases of the Diversification period. However, interior storage pits were apparently more common in Sopris phase and Developmental period houses than in Apishapa phase structures. Isolated structures were common in the Developmental and Diversification periods, but the latter period also includes massive multiroom structures and ancillary barrier walls. These temporal trends in architecture have many implications for discerning changes in settlement pattern that ultimately tighten the definition of the Diversification period.

- Are the auxiliary wall segments, referred to variously as barrier walls, fences, and/or alleyways, associated only with architectural sites of the Diversification period?

- Are aggregated room structures associated only with the Diversification period; if so, are they more prevalent during the latter half of the Diversification period?

- Are prepared floors associated only with the Diversification period?

- Is wall construction using horizontal slabs associated only with architecture of the Diversification period?

Much remains to be learned of the reasons for the substantial variability seen in architecture of the Diversification period. Architecture in the context area includes the enigmatic rectilinear cobble wall structures, the circular slab walls of the Apishapa phase, and the subrectangular to rectangular, horizontal slab walls of the Sopris phase. However, within these basic frameworks considerable variability is reported that remains largely uninterpreted. Structures are noted to vary in attributes such as room size, wall construction, floor preparation, structure shape, and interior and exterior features. Architectural sequences are currently prohibitive because available chronometric data indicate that this variability was roughly contemporaneous. Future investigations may expose the relationship between the variability and such factors as functional differences (e.g., storage versus communal work areas) and/or community organization (e.g., status).

- What evidence for room contemporaneity exists within the large, multiple-structure sites of the Diversification period?

- Is the variation in room size and construction related entirely to functional considerations, e.g., are the largest rooms communal work areas and the smallest, storage facilities?

- Do any or all Diversification period architectural sites reflect planned community organization?

- Are there regional trends in architecture that are not attributable to phase-level distinctions, e.g., is aggregated room architecture, regardless of phase, more pervasive along the Purgatoire River than in other portions of the context area?

- Are the cobble wall foundations found in the upper Purgatoire and Huerfano river drainage basins related, and what is their relationship to Apishapa and Sopris phases?

Detailed comparison of architecture of the Apishapa and Sopris phases is crucial for elucidating settlement and perhaps interregional relationships of the Diversification period. Such comparison is inhibited by the substantial variability seen within each of these phases, i.e., no standard structural form is discernible for either the Apishapa or the Sopris phase. Currently, a compendium of architectural attributes must be assessed to determine patterns or trends that are more likely associated with a particular phase. Such trends may have important implications for interpretation of sedentism, mobility, and community organization of the Diversification period. Furthermore, these architectural data may generate more precise indications of the manner in which architectural attributes originating in surrounding regions diffused into the context area.

- Are storage rooms more likely associated with Sopris phase architecture?

- Are isolated, single-room structures more likely associated with Apishapa phase settlement?

- How do Apishapa and Sopris phase superstructures compare?

- Are mortuary chambers associated only with Sopris phase architecture, and does this reflect greater levels of social organization and sedentism or simply that Apishapa settlements tend to be built in areas where bedrock is near the surface?

- Are "barrier wall" segments more prevalent among Apishapa phase than Sopris phase components?

- Do Sopris phase architectural attributes e.g., rectilinear foundations, collared hearths, storage bins, and heavily mortared horizontally laid slabs, compare in any way with Plains Village manifestations to the east, such as the Antelope Creek phase?

- How does Apishapa phase architecture compare with that of the various Plains Village manifestations?

- Does wall construction of the Sopris phase exhibit the variability that is typical of Apishapa phase structures?

Geomorphology and Paleoclimates

Convincing evidence exists for climatic deterioration during the Diversification period from both within and outside the context area. Conditions became more xeric after ca. A.D. 1000, with strong implications for demographic changes ending in apparently regional abandonment at the end of the period. Despite the consensus that exists among archaeologists and geomorphologists alike about directional climatic change during this period, the specifics of such change are poorly understood. Research remains to be undertaken about the timing, intensity, and exact nature of paleoclimatic change, the geographic expression of such change, and the implications for human adaptation.

- When did the climate begin to change, and was the transition from mesic to xeric conditions gradual or abrupt?

- Do paleoclimatic data suggest widespread drought conditions in the context area by the A.D. fourteenth century?

- Did xeric conditions intensify during the course of the Diversification period, or did conditions become static after an initial paleoclimatic shift?

- What other geomorphic processes were predominant during the period besides eolian activity?

- Can paleosols be identified that are associated with the Diversification period, particularly in higher, moister areas where the effects of climatic deterioration might have been less severe?

- Is the post-A.D. 1000 increase in eolian activity seen at specific locales in fact widespread through the context area?

- Do sand dunes and sand sheets that developed during the Diversification period display the same association with human settlement that is evident in such deposits of earlier age?

- Could the absence of archaeological sites after ca. A.D. 1450 reflect, at least in part, the loss of terrains due to paleoclimatic conditions and related geomorphic processes?

- What relationship exists between the so-called Great Drought of the late thirteenth-early fourteenth century Southwest and the paleoclimate of the context area during the Diversification period?

- Did climatic change affect the numbers and distribution of bison in the plains portion of the context area during this period?

PROTOHISTORIC PERIOD

Introduction

The final period of the Late Prehistoric stage is assigned a temporal range extending from A.D. 1350(?)/1450 to A.D. 1725. Previously, the definition of the Protohistoric period has involved subjective measures of European and aboriginal interaction, i.e., the temporal range is said to encompass the time between the initial contact of Spanish and Native American cultures, and the onset of regular interaction among them (Lintz and Anderson 1989:27). For the Arkansas River Basin, it is believed more appropriate to describe the onset of the Protohistoric period via the possibly overlapping dates associated with Apishapa phase abandonment and the arrival of Athapaskan groups. Neither event is well documented in the context area, but the timing may become more refined through the acquisition of additional chronometric data. The date of the transition from the Protohistoric period to historical events was given as A.D. 1750 in the previous research context (Eighmy 1984), but as Gunnerson (1987:113) notes, this date is somewhat arbitrary. Historical records for European/aboriginal contact in the region extend back to the Coronado Expedition of 1540-1542. However, these earlier data are meager and often placed within the realm of regional ethnohistorical research, for which there are several summaries available (Carrillo 1999; Eddy et al. 1982; Hanson and Chirinos 1989; Jones et al. 1998; Weber 1990). The date of A.D. 1725 presented here to represent the terminus of the Protohistoric period coincides largely with the withdrawal of various Apachean (i.e., Athapaskan) bands from southeastern Colorado (e.g., Carlana, Penxayes, Cuartelejos, Palomas) and concomitantly, an increase in Spanish expeditions and Comanche incursions. That many of these southern Athapaskan bands eventually became subsumed within a single taxon, "Jicarilla Apache," has as much to do with the difficulties involved in verifying their individual identities as recognizing any broad affinities among them (Jones et al. 1998:62). Apachean withdrawal was evidently provoked by the advent of the Comanche, whose efforts to control the Arkansas River Basin were ultimately successful. Beginning shortly before 1700, historical records for the Southern Plains expand dramatically through accounts of the Oñate, Zaldivar, Ulibarri, and Valverde expeditions. These chronicles indicate that the various Apachean groups were harassed by the Comanche and their Ute allies as early as 1706, and by 1719 were well into the process of being pushed into eastern New Mexico and west-central Texas (Carrillo 1999; Weber 1990).

The ethnohistory of the Arkansas River Basin is well summarized in a number of recent documents (Carrillo 1999; Eddy et al. 1982; Hanson and Chirinos 1989; Jones et al. 1998; Weber 1990); this section emphasizes the poorly known archaeological sites of the Protohistoric period. Such sites have been regarded previously as "undefined Apachean" or "Southern Plains Apache" manifestations that resulted from the migration of Athapaskan groups from west-central Canada

(Gunnerson 1987; Lintz and Anderson 1989:29). The terms "Apachean" and "Athapaskan" as used for Protohistoric period occupation in the context area have become interchangeable. The cultures related by their common Athapaskan linguistic stock included those known historically as the Navajo, Mescalero Apache, Chiricahua Apache, Kiowa Apache, and Jicarilla Apache. Of these, it is the last group named and its predecessors that evidently play the most prominent role in the later Protohistoric occupation of the context area. Overall, these groups are characterized by considerable variability in adaptation, likely because of their propensity for interacting with, and adopting certain elements of, neighboring cultures. However, Athapaskans are speculated to have entered the context area during the Late Prehistoric stage as aceramic, nomadic bands that used dog travois and whose subsistence centered on foraging and bison hunting. In actuality there is little or no archaeological data pertaining to prepottery Athapaskans in the context area. To date, investigators have established no criteria for distinguishing such sites from those of earlier, or perhaps contemporaneous, indigenous hunter-gatherer populations. During the course of the Protohistoric period, some Athapaskans evidently evolved into a more sedentary populace that practiced a dual foraging-gardening subsistence strategy and manufactured pottery.

The most prominent archaeological manifestation of Protohistoric Apachean occupation in the Central Plains is the Dismal River aspect (Gunnerson 1987:102-107). Dismal River architectural settlements or "villages" are known primarily from locales in Nebraska and western Kansas, where these people interacted with Caddoan groups. However, the Dismal River aspect is believed to extend into the Arkansas River Basin since it may include a regional settlement phenomenon termed "El Cuartelejo" (the far quarter) by seventeenth and early eighteenth century Spanish explorers (Carrillo 1999; Gunnerson 1987). Rather than a single massive community, El Cuartelejo is currently seen as a series of Plains Apache "rancherias" situated north of the Arkansas River and extending from Horse Creek in Crowley County, Colorado to Scott County, Kansas (Carrillo 1999). These settlements figure prominently in regional historical accounts because of their role as refugia for Taos and Picuris Puebloans fleeing from Spanish oppression (e.g., the Pueblo Revolt of 1680 in New Mexico). To date, however, archaeological sites that are confirmed to be affiliated with El Cuartelejo have not been identified in the context area. Apachean sites fronting the Sangre de Cristos and extending into the mesas and canyons of southeastern Colorado and northeastern New Mexico are posited to represent an Athapaskan cultural variant distinct from the Dismal River aspect (Brunswig 1995). This division, probably comprised of a number of bands, has been termed Jicarilla or Sangre de Cristo Apache and was influenced by contact with Rio Grande Puebloans (Brunswig 1995; Gunnerson 1987). The level of admixture and interaction among these Apachean groups is currently unknown.

Chronology

The estimated time of the Southwestern Athapaskan entrada remains controversial. Avonlea materials, presumed to be associated with the Athapaskan predecessors of the Plains Apache, date between A.D. 400 and 1250 on the Northwestern Plains; associated chronometric data achieve a peak from roughly A.D. 800 to 1000 (Brunswig 1995:174-175; Frison 1991:111). In the Southwest, most investigators believe that linguistic and archaeological evidence is indicative of an early sixteenth century arrival (Brunswig 1995; Carrillo 1999; Gunnerson 1987; Jones et al. 1998:59). The time segment between approximately A.D. 1250 and 1550 is murky with regard to Apachean archaeology. In discussing the Dismal River aspect, Gunnerson (1987:102) notes that "although Apachean sites of the 1500s have not yet been identified, they are certain to exist." Most sites referred to as Protohistoric Apachean are identified on the basis of micaceous pottery, the dating of which is not firmly established in the context area (Hummer 1989:367-368). Rock art offers much potential for identifying Protohistoric components but such data are currently limited to relatively few sites (Loendorf 1989; Loendorf and Kuehn 1991). Most significantly, there is little radiocarbon information indicative of Protohistoric period

occupation in the Arkansas River Basin (see Appendix A). The more prominent examples are summarized here.

An association between early Apachean occupation and stone circle or "tipi ring" sites has been suggested for tributaries of West Carrizo Creek Canyon in Las Animas County (Kingsbury and Nowak 1980; Kingsbury and Gabel 1980). Charred bone recovered from a hearth situated within 2 m of a tipi ring at 5LA1052 produced a radiocarbon age assessment of A.D. 1350 ± 55 (Kingsbury and Nowak 1980:66). Furthermore, ceramics identified as Pueblo IV trade ware (San Lazaro Glaze polychrome) were recovered from another nearby tipi ring site, 5LA1721. A date range of A.D. 1490 to 1515 was ascribed to the manufacture of this type of pottery (Kingsbury and Nowak 1980:66). Charcoal samples recovered from an enigmatic rectilinear Structure 1 at 5HF1079 on Bucci Ranch property produced a range of Late Prehistoric stage radiocarbon age assessments (Zier et al. 1996b; see synthesis of Late Prehistoric stage, this volume). Although the associated diagnostic materials indicated a Diversification period occupation, the latest radiocarbon date was a conventional age of A.D. 1430 ± 60, suggesting the possibility for a Protohistoric period component. Apachean pottery (Ocate Micaceous) was collected from site 5HF1093, approximately one mile distant from the structure.

A conventional radiocarbon date of A.D. 1435 ± 65 was recovered from an unusual burned rock feature at the Louden site near Mesa de Maya in Las Animas County (Greer 1966). The investigator noted similarities to mescal and/or sotol pits in western Texas and southern New Mexico, but no diagnostic Apachean artifacts were recovered. A tipi ring was associated with the site but its affiliation has not been established. Conventional radiocarbon age assessments of A.D. 1530 ± 80 and A.D. 1550 ± 95 were obtained from bone associated with the interment of a young female at the Chubbuck-Oman site in Cheyenne County, Colorado (Tipton 1967). The only artifacts recovered from this burial were 42 *Olivella* shell beads. Cultural affiliation was tentatively attributed to the "Upper Republican Horizon" (Tipton 1967:20) A conventional radiocarbon age assessment of A.D. 1580 ± 60 was obtained from near the surface at the Sue site at the PCMS (Loendorf and Kuehn 1991). Interestingly, although the Apachean pottery associated with this date was noted as similar to Hummer's Polished Category 1, a type comparable to Dismal River pottery (Loendorf and Kuehn 1991; Loendorf et al. 1996), it is listed as Ocate Micaceous in Brunswig's report on Apachean ceramics (Brunswig 1995:Appendix A). This matter is discussed in greater detail in the Technology section, below. A rockshelter component believed to be related to the radiocarbon-dated Protohistoric occupation at the Sue site was recorded at 5LA3189 (Loendorf et al. 1996:167-189). This site is situated along Burke Arroyo, a drainage in proximity to Van Bremer Arroyo, along which the Sue site is located. Two types of Apachean pottery, Micaceous Category 3 and Micaceous Category 5, were recovered from 5LA3189. These types are possibly representative of pronounced differences in manufacture origin. Micaceous Category 3 is believed to be comparable to Dismal River pottery, but Micaceous Category 5 sherds suggest the presence of a globular "Jicarilla bean pot" (Loendorf et al. 1996; Hummer 1989:359-362). Also situated along Van Bremer Arroyo in relative proximity to the Sue site are two spaced stone circle sites with associated ceramics believed to be representative of Apachean occupation (Andrefsky et al. 1990). Both of the sites, 5LA5254 and 5LA5256, are associated with Polished Category 1 sherds that compare favorably with Dismal River pottery (Hummer 1989; Sanders 1990). Additionally, a blue glass trade bead was recovered from 5LA5254. Together, these PCMS sites constitute evidence of significant Apachean occupations possibly dating to the late sixteenth century.

In contrast to virtually all other research, Schlesier (1994:331, Figure 14.2) sees a continuum of Athapaskan occupation within the context area through the latter half of the Late Prehistoric stage. Schlesier believes that an Avonlea migration prior to A.D. 1000 resulted in the Sopris phase occupations beginning ca. A.D. 950. As stated earlier in the document, this thesis is

based primarily on scant skeletal evidence from the Sopris phase. Thirteen burials, primarily from 5LA1416, were examined for the frequency of triple-rooted first molars, a trait for which high percentages are associated with Athapaskan populations. Turner (1980:Appendix I) found this characteristic among 23.1 percent of the first molars associated with the 13 Sopris mandibles and concluded, "These calculations suggest that there is reason to suspect the Colorado sample might be Athabascan, and that it would be worthwhile for the archaeologists to assess affinity using other recovered materials with this possibility in mind." Other forms of data have failed to corroborate such an affinity (see Sopris phase discussion, this chapter).

Protohistoric sites in the context area are shown in Figure 7-5.

Population Dynamics

Brunswig (1995:172-175) summarizes Athapaskan migration in an article that reviews Apachean ceramics from a variety of regions including eastern Colorado. The author suggests that Late Prehistoric Avonlea assemblages from southern Wyoming and northeastern Colorado represent the immediate predecessors of the Protohistoric Apacheans. By the late sixteenth century, according to Brunswig, Apacheans were well established throughout the Central and Southern Plains and the Southwest. Furthermore, a number of divisions or "culture pattern variants" are apparent within the overall Plains Apache phenomenon that may represent highly variable band-level expressions. This variability is, in part, thought to reflect regionally based differences in the acquisition of traits from neighboring culture groups (Brunswig 1995:191; Gunnerson 1987). Based largely on morphological variation among ceramic assemblages, investigators have recently identified three "hypothetical culture pattern variants": an eastern Dismal River variant adopting traits from neighboring Caddoan groups, a western Dismal River variant influenced by Shoshonean groups of the central Rocky Mountains, and a variant labeled Sangre de Cristo or Jicarilla Apache that is characterized by significant interaction with Rio Grande Puebloans (Baugh and Eddy 1987; Brunswig 1995).

Brunswig (1995:Appendix A) identified 22 sites in the context area with pottery diagnostic of two Apachean variants, the western Dismal River and Sangre de Cristo. A map in the report shows that the western Dismal River pottery is largely restricted to the northern and western portions of the context area, and that Sangre de Cristo Micaceous pottery is primarily distributed within and south of the Purgatoire River region (Brunswig 1995:Figure 2). However, this sample includes only a portion of the 1983-1984 PCMS site sample from which Apachean-like pottery was recovered. The PCMS sites listed in Appendix A of Brunswig's 1995 report include only those with Polished Category 1 specimens; excluded are PCMS sites associated with micaceous ware specimens that Hummer believed were comparable to Apachean ceramics (Brunswig 1995; Hummer 1989). Furthermore, whereas Hummer (1989) and Sanders (1990) compare Polished Category 1 to Dismal River aspect pottery, Brunswig (1995:Appendix A) lists these sherds as Ocate Micaceous. This possible oversight is discussed in greater detail in the Technology section below. Campbell's (1969a:116-117) Chaquaqua Plateau micaceous pottery sites are also excluded from Brunswig's study, but this situation can be attributed to the limited ceramic descriptive data. Although Brunswig provides an important and useful synthetic report on Apachean ceramics and population dynamics, some of the basic data sets need to be reexamined. The Purgatoire River region may be characterized by greater interaction and movement among the various Apachean cultural variants than is suggested by Brunswig's work.

The context area is characterized by relatively few archaeological manifestations that are confirmed as Protohistoric Apachean. Although ceramic research indicates that two Apachean variants are represented, major settlements associated with either are currently unknown in the Arkansas basin (Brunswig 1995). Two of the more prominent concentrations of Apachean

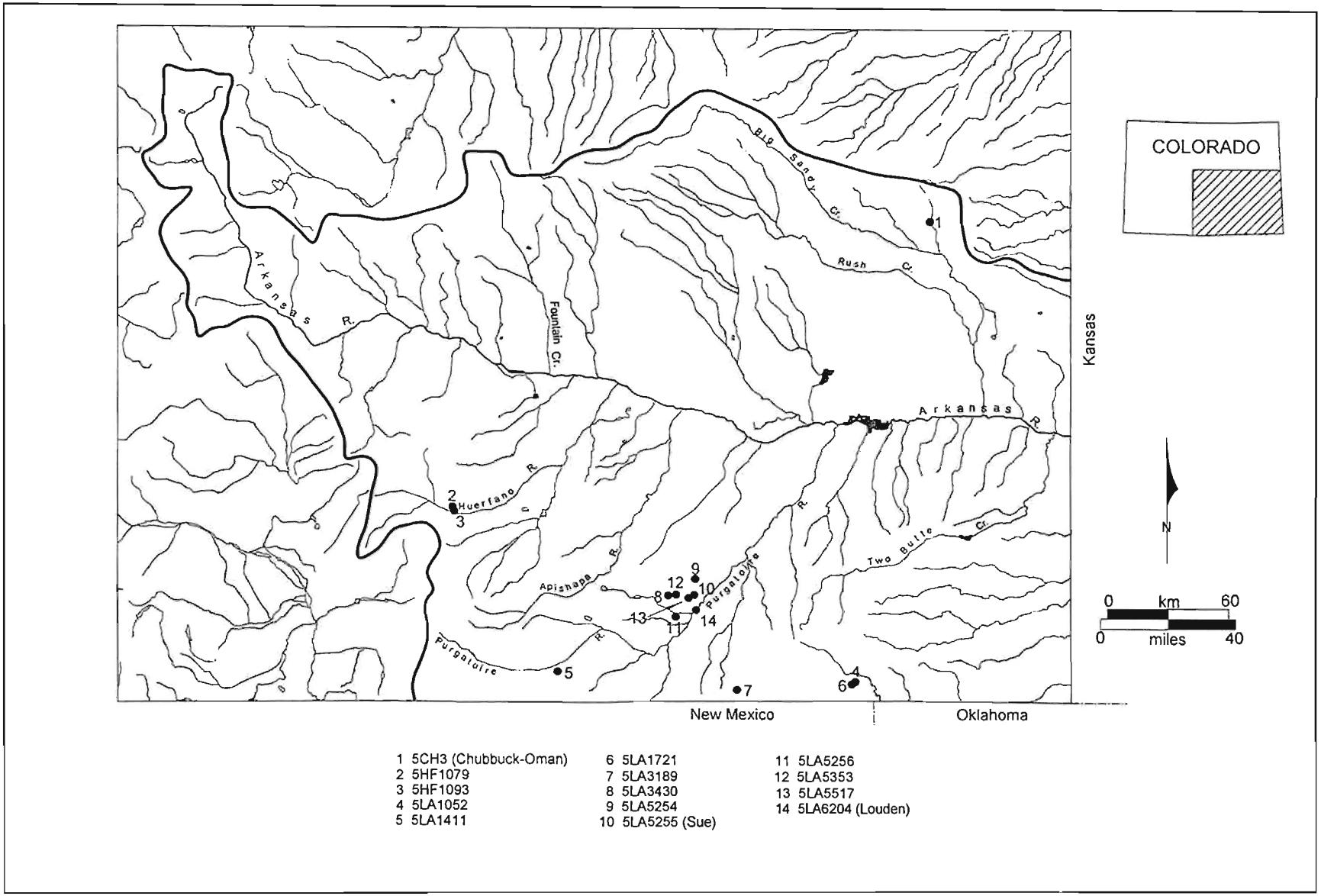

Figure 7-5. Map of Arkansas River context area showing locations of selected Protohistoric period sites.

occupation are currently known from the West Carrizo Creek region and in the Van Bremer/Burke Arroyo vicinity within the PCMS (Andrefsky et al. 1990; Loendorf 1989; Loendorf et al. 1996; Kingsbury and Nowak 1980). These occupations are characterized primarily by a series of tipi ring and/or rockshelter sites indicative of temporary residences for plains nomads traveling through the context area. Protohistoric components in the context area have sparse artifact and feature assemblages that are suggestive of short-term, limited activity occupations (Andrefsky 1990; Andrefsky et al. 1990; Campbell 1969a; Greer 1966; Kingsbury and Nowak 1980). The major Apachean residences of this period are known to the north and east in Nebraska and Kansas, and to the south in northeastern New Mexico. The latter include the Glasscock and Sammis sites in the region of Cimarron, New Mexico, and Ojo Perdido near Las Vegas, New Mexico (Gunnerson 1987). Dismal River aspect sites in Nebraska and Kansas include White Cat Village and the Lovitt site (Gunnerson 1987). Gunnerson (1987:103) identifies Cedar Point Village as a Dismal River settlement; this site is located in northeastern Colorado near Limon. Wood (1971:81) notes that such an assessment of Dismal River affiliation "is perhaps the most plausible one, choosing from among the cultures in eastern Colorado now known to us, but it is not an especially defensible one." The comparative paucity of Protohistoric residential bases in the context area may be due to sampling bias, i.e., large expanses are yet to be investigated.

Technology

Relatively few artifacts are associated with the meager sample of Protohistoric period sites recorded in the context area. The presence of Avonlea lithic and/or ceramic assemblages has not been confirmed in the Arkansas River Basin. Lithic and bone tool morphologies associated with Apachean sites correspond to those of the preceding Diversification period. Points recovered from Apachean sites in the context area include a variety of Archaic forms (possibly curated) as well as small, triangular, unnotched and side-notched points such as Fresno, Reed, Washita, and Haskell types (Andrefsky et al. 1990; Campbell 1969a; Kingsbury and Nowak 1980; Loendorf et al. 1996). Currently, pottery is the artifact class believed most diagnostic of this particular segment of Arkansas basin prehistory (Baugh and Eddy 1987; Brunswig 1995; Gunnerson 1987). Several different sources for Apachean pottery recovered from the context area are identified in recent studies (Baugh and Eddy 1987; Brunswig 1995; Hummer 1989). Sangre de Cristo Micaceous pottery influenced by interaction with Rio Grande Puebloans is perceived as distinct from Dismal River Gray Ware that evidences attributes derived largely from Caddoan groups (Baugh and Eddy 1987; Brunswig 1995).

Types are defined within both the Sangre de Cristo Micaceous and Dismal River Gray Ware ceramics (Brunswig 1995; Hummer 1989). Ocate and Cimarron Micaceous pottery are believed to be associated with earlier and later components, respectively, of the Sangre de Cristo Apache culture pattern variant. These ceramics are heavily micaceous and are constructed by a combination of coiling and hand forming. They are often globular pots exhibiting striations indicative of thinning by corncob scraping (Brunswig 1995:188-189). Hummer (1989:354) notes that the high density of mica in these sherds may be reflective of either the use of residual micaceous clays or micaceous rock temper. Dismal River pottery includes Lovitt Plain and Lovitt Simple-stamped, two types that are distinguished from one another by the presence or absence of decoration (Brunswig 1995:183). These ceramics have lesser amounts of mica than the Sangre de Cristo Micaceous pottery and are hand formed by a paddle-and-anvil technique (Baugh and Eddy 1987; Brunswig 1995). Although these distinctions seem clear-cut, several complications are attached to interpreting cultural affiliation through the presence of micaceous pottery.

> Geological and ethnographic studies indicate that numerous Plains and Puebloan tribes used the same clay and temper sources to manufacture similar looking vessels, particularly after A.D. 1550 (Warren 1981). Helene Warren (personal communication 1985) warns

against trying to identify even Ocate Micaceous without petrographic analysis [Hummer 1989:351].

Helene Warren (personal communication, March 15, 1975), contradicting Gunnerson's position, notes that currently there are no known characteristics which distinguish Pueblo micaceous utility pottery from Apache-made micaceous utility pottery [Thoms 1976:29].

As discussed previously, some confusion is evident in the classification of Apachean ceramics recovered from the context area. In his report on Apachean ceramics, Brunswig (1995:Appendix A) notes that both Lovitt Plain ceramics affiliated with the western Dismal River variant and Ocate Micaceous ceramics associated with the Sangre de Cristo or Jicarilla Apache variant have been recovered from sites in the Arkansas River Basin. A map showing the spatial distribution of these Apachean pottery types across Colorado and surrounding regions is based on data presented in Appendix A of the article (Brunswig 1995:Figure 2). The map demonstrates that Ocate Micaceous is prevalent within the southern portion of the context area in the Purgatoire River region. One may therefore infer that the Apachean groups in this region are largely related to the Sangre de Cristo or Jicarilla variant that was influenced by Rio Grande Puebloans. However, the Purgatoire River region pottery listed in Brunswig's Appendix A is dominated by sherds recovered from PCMS sites in Las Animas County. As noted above, only the PCMS Polished Category 1 specimens reported by Hummer (1989:332-336) are listed in Brunswig's Appendix A. Although Hummer notes that this type evidences similarities with Dismal River Lovitt Plain pottery, Brunswig lists these specimens as Ocate Micaceous in Appendix A. Furthermore, all of the PCMS ceramics assigned to Micaceous Ware categories (Hummer 1989:350-363) were overlooked in Brunswig's research (Brunswig 1995:Appendix A). It is actually Micaceous Category 1 that Hummer (1989:353) believes to be most similar to Ocate Micaceous. Also recovered from PCMS sites were Micaceous Category 2 specimens comparable to Cimarron or Taos Micaceous, Micaceous Category 3 specimens comparable to Dismal River pottery from the Central Plains, Micaceous Category 5 specimens thought to represent a single Jicarilla bean pot, and Micaceous Category 6 specimens representative of a single Lovitt Micaceous vessel affiliated with the Dismal River aspect. (Note: These sherds are now believed to represent pottery traded from the Southwest [Baugh and Eddy 1987; Brunswig 1995].) Thus the possibility exists for greater variability among Apachean pottery types in the Purgatoire River region than is shown by Brunswig's report. This in turn suggests that the Purgatoire River region may have indeed represented an intermediate location characterized by considerable interaction (e.g., trade networks) among various Central Plains and Southwestern bands (Hummer 1989:371).

Settlement and Subsistence Strategies

Site Type and Locational Variability

Archaeological data and historical accounts from surrounding regions indicate that the term "Apachean" may encompass a range of settlement-subsistence strategies. These include the tipi rings associated with nomadic bands using dog and horse travois, as well as the more sedentary, so-called Apache "rancherias" of El Cuartelejo and "pueblos" of northeastern New Mexico (Gunnerson 1987; Weber 1990). The few archaeological sites in the Arkansas basin with radiocarbon dates and purported Apachean ceramics currently do not permit a viable assessment of Protohistoric settlement pattern. Ethnohistoric accounts suggest that Penxaye and Cuartelejo Apaches were living in horticultural villages along the Purgatoire and Arkansas river regions of the context area (Carrillo 1999; Hanson and Chirinos 1989; Jones et al. 1998; Weber 1990). Archaeological manifestations of such settlements, however, are yet to be found. Protohistoric site

assemblages that do reflect the larger and longer-term residences of either the Dismal River aspect or the Sangre de Cristo Apache variants are known to the north, south, and east of the context area.

Most Protohistoric Apachean sites in the Arkansas River Basin are identified on the basis of associated pottery, rock art, and often, the presence of stone circles or tipi rings. Although stone circle sites are fairly common in the Arkansas River Basin (e.g., Andrefsky 1990; Andrefsky et al. 1990; Campbell 1969a:340-343; Hand et al. 1977; Kalasz 1988, 1990; Kingsbury and Nowak 1980), they can be reliably assigned a Protohistoric affiliation in only a limited number of cases. Some of tipi ring sites are massive; 72 spaced stone structures were recorded at 5LA5372 at the PCMS but no ceramics were associated. Two of the more prominent, context-area tipi ring concentrations with ceramics and/or radiocarbon dates suggestive of Apachean occupation are known from the PCMS and the West Carrizo Creek regions (Andrefsky 1990; Andrefsky et al. 1990; Kingsbury and Nowak 1980) Apachean ceramics were also recovered in or near rockshelters at the Sue site and 5LA3189 in the PCMS (Loendorf and Kuehn 1991; Loendorf et al. 1996). In general, Protohistoric sites in the context area are associated with sparse artifact and feature assemblages suggestive of specialized, seasonal round-oriented resource procurement along major drainage courses (Andrefsky et al. 1990; Campbell 1969a; Hand et al. 1977; Kingsbury and Nowak 1980; Loendorf and Kuehn 1991; Loendorf et al. 1996). The watercourse sites tend to be in areas where the drainages form shallow incisions in open plains or at canyon headwaters.

The large numbers of Apachean micaceous sherds recovered from the Sopris phase architectural settlements, 5LA1211 and 5LA1416, present a somewhat anomalous situation (Wood and Bair 1980). The occurrence of Apachean occupations in the vicinity of, but approximately 300 years after, two major settlements of the Diversification period is unusual. The area from which 370 micaceous sherds were recovered at 5LA1211 (Area D) was interpreted to represent a ceramic dump that was in use for 900 years (Wood and Bair 1980). However, the presence of an Apachean ceramic dump implies some sort of semisedentary settlement in the area that is unconfirmed.

Economy

As with settlement patterns, much of the meager Protohistoric economic information from the Arkansas River Basin has been gleaned from historical accounts rather than archaeological investigation. The earliest Athapaskan groups were purportedly characterized by a nomadic hunting and foraging economy emphasizing bison procurement (Friedman 1982; Gunnerson 1987). Although hunting (primarily bison) and gathering remained the most prominent aspect of Apachean subsistence, it is evident that horticulture was adopted by at least some bands during the course of the Protohistoric period. Various accounts of Spanish expeditions attest to the variety of foods consumed by Apachean populations. In summarizing the Onate expedition of 1601, Friedman quotes the following passage from the chronicle: "At some places we came across camps of people of the Apache nation, who are the ones who possess these plains, and who having neither fixed place nor site of their own, go from place to place with the cattle [bison] always following them" (Bolton 1908:253, cited in Friedman 1982:237). Little more than one hundred years later, as the Ulibarri expedition of 1706 passed through Purgatoire River region, "they found that the Penxayes planted on the banks of the Santa Ana [Purgatoire] raising corn, beans, and pumpkins"; south of the Arkansas River near present-day Holly, "they met a Penxaye woman and girl gathering cherries" (Schroeder 1974:338, cited in Weber 1990:XVII-11).

Direct archaeological evidence for Apachean diet in the context area is limited to a single flotation sample from a spaced stone circle site (5LA5353) in the PCMS (Andrefsky et al. 1990). An Apachean affiliation for this site is suggested by the presence of Micaceous Category 2 sherds

comparable to Cimarron Micaceous pottery (Hummer 1989; Sanders 1990). Charred *Chenopodium/Amaranthus* seeds were recovered from a darkly stained area (Feature 9) associated with the micaceous sherds. Indirect evidence for subsistence includes the ground stone and projectile point collections from a number of other sites (e.g., 5LA1052, 5LA1727, 5LA3189, 5LA5254, 5LA5255, 5LA5256) where an Apachean component is believed to be present (Andrefsky 1990; Andrefsky et al. 1990; Loendorf and Kuehn 1991; Loendorf et al. 1996; Kingsbury and Nowak 1980). Together these sparse data are indicative of an emphasis on hunting and wild plant processing.

Architecture

Archaeological and ethnohistorical data demonstrate that considerable morphological variability characterizes Apachean structures recorded throughout the Southwest and the plains (Gunnerson 1987:Figures 20-23). This variability, expressed both temporally and spatially, is believed reflective of the diverse settlement strategies employed by the various Apachean bands throughout the Protohistoric period. There appears to be a major architectural division between the portable tipis of the Plains Apache nomads and the structures associated with the more sedentary "rancheria" or "pueblo" communities of the Central Plains and northeastern New Mexico Apache. The latter range from semisubterranean earth lodge-like structures of the Dismal River aspect to adobe walled multiroom structures of the Glasscock site in northeastern New Mexico (Gunnerson 1987).

Protohistoric architecture in the Arkansas River Basin, as understood at present, is largely limited to the circular, noncontiguous arrangements of rock known as spaced stone circles or tipi rings. These spaced stone walls are generally believed to be associated with the conical pole and hide structures (tipis) of plains nomads. The circular arrangement of rock was purportedly the result of their use as weights to hold down lodge coverings (Kehoe 1960; Kingsbury and Gabel 1980). Alternatives to this traditional view, e.g., that the rings represent gaming circles, vision quest structures, and dance circles, have been well summarized in previous reports (W. Davis 1982; L. Davis 1983; Frison 1991; Mulloy 1952). The extreme range in floor area exhibited by PCMS spaced stone enclosures may be used to support the hypothesis that these structures represent a variety of functions (Kalasz 1988, 1990). Nevertheless, context-area tipi rings are typically affiliated with the domiciles of plains nomads. Previous studies of tipi rings have addressed the possibility that temporal distinctions in tipi ring morphology are discernible through size observations (Kalasz 1990:XII-19; Kehoe 1983; Mobley 1983; Wilson 1983). Differing size ranges are inferred to be attributable to "dog period" versus "horse period" occupations, i.e., larger lodges tended to be associated with the latter because of their increased carrying capacity. Such distinctions, however, are unconfirmed.

Examples of possibly Apachean tipi ring sites in the Arkansas River Basin include 5LA1052 and 5LA1721 in the vicinity of West Carrizo Creek Canyon; 5LA3430, 5LA5517, 5LA5254, 5LA5256, and 5LA5353 at the PCMS; and 5LA1411 in the upper Purgatoire region (Andrefsky et al. 1990; Hand et al. 1977; Hummer 1989; Kingsbury and Gabel 1980; Kingsbury and Nowak 1980). Of these stone circle sites, all but 5LA3430 and 5LA5517 have been subjected to limited testing or excavation. The Apachean affiliation ascribed to the West Carrizo Creek tipi rings is based on the associated radiocarbon age assessment of A.D. 1350 ± 55 and the presence of Pueblo IV polychrome pottery (Kingsbury and Gabel 1980). Two of the PCMS sites situated along Van Bremer Arroyo, 5LA5254 and 5LA5256, are associated with Polished Category 1 sherds that are comparable to Dismal River aspect pottery (Andrefsky et al. 1990; Hummer 1989; Sanders 1990). A glass trade bead was also recovered from 5LA5254. However, diagnostic points collected from these two tipi ring sites at the PCMS suggest artifact curation and/or the presence of earlier components. Micaceous ceramics indicative of Sangre de Cristo Apache

occupation or trade were recovered from the remaining four tipi ring sites discussed herein. Micaceous Category 2 sherds comparable to Cimarron Micaceous pottery were recovered from 5LA5353 along Taylor Arroyo in the PCMS (Andrefsky et al. 1990). Two spaced stone circle sites recorded through survey in the PCMS also were associated with micaceous pottery; Micaceous Category 1 sherds similar to Ocate Micaceous pottery was recovered from site 5LA3430, and Micaceous Category 2 sherds similar to Cimarron Micaceous ceramics were recovered from 5LA5517 (Andrefsky 1990:Appendix G; Hummer 1989). Finally, Ocate Micaceous ceramics were recovered from 5LA1411 in the upper Purgatoire region (Hand et al. 1977).

The possibility that spaced stone circles or tipi rings are much older than the Protohistoric period must also be considered. Although only a few radiocarbon dates are currently associated with such structures in the context area, on the Northwestern Plains, tipi rings begin to appear during the Middle Archaic period (Frison 1991). In addition to the single date from the West Carrizo Creek example, a radiocarbon age assessment of A.D. 780 ± 120 was obtained from a hearth within a spaced stone circle at PCMS site 5LA5249 (Andrefsky et al. 1990; Kalasz 1990:XII-13). This date from the Developmental period is therefore considerably earlier than that associated with the arrival of the Athapaskans in the Arkansas River Basin. These data indicate that considerably more chronometric data are required to resolve questions about tipi ring or spaced stone circle cultural affiliation.

Directions for Future Research

Chronology

Of the three periods assigned to the Late Prehistoric stage, it is the Protohistoric period that suffers most from a lack of chronometric data. Furthermore, although pottery is most often used to affix a Protohistoric affiliation to context-area sites, a number of issues need to be addressed. Most significantly, the earliest Athapaskan migrations into the context area were evidently aceramic and thus may not be associated with diagnostic artifacts. Questions also arise as to whether the micaceous ceramics attributed to Apachean manufacture can be distinguished from those produced by Rio Grande Puebloans. Other feature and artifact classes to date have been of little use in identifying Protohistoric occupation. Early European goods are rarely encountered, and lithic and bone tool assemblages apparently do not differ significantly from those of earlier periods. The only features that have been previously associated with Protohistoric groups are the so-called tipi rings or spaced stone circles. However, these structures were probably in use much earlier than the Protohistoric period and were undoubtedly associated with later Historic occupations as well.

- When did Athapaskan groups arrive in the context area?
- Did Athapaskan migration into the Arkansas River Basin temporally overlap the occupations of the Diversification period?
- How can the earliest Athapaskan sites be distinguished from other Late Prehistoric stage sites?
- Can earlier Athapaskan sites be distinguished from those of later, Apachean occupations?
- What, if any, are the temporal distinctions between sites with Sangre de Cristo or Jicarilla Apache affiliation and those with Dismal River aspect affiliation?

Population Dynamics

The distribution of various Apachean pottery types and their association with tipi rings is indicative of significant movement and interaction among various Apachean bands within the context area. Most noteworthy is the variety of pottery concentrated within several PCMS sites. Both Sangre de Cristo pottery originating in the Southwest and the Dismal River pottery of the Central Plains were recovered from this relatively small area in Las Animas County, Colorado. These data support the view that the intermediate location of the Purgatoire River region between the plains and Southwest may have been particularly conducive for establishing and maintaining trade or other relationships. Protohistoric site locations may represent nomadic groups passing through the area during the course of seasonal rounds or, alternatively, trade forays sent from larger settlements in the Central Plains, Southern Plains, and the Southwest. Research into these topics is restricted by an inability to identify the affiliation of various Apachean sites. A greater emphasis on petrographic source analyses of both ceramic and lithic collections would greatly benefit research of population movements, and perhaps band origins. Furthermore, advances in rock art analysis may facilitate the identification of Apachean bands that were present in the Arkansas River Basin.

- What is the extent of Sangre de Cristo or Jicarilla Apache occupation in the Arkansas River Basin?
- What evidence exists for Cuartelejo Apache settlement in the context area?
- To what extent do cultural attributes of Central and Southern Plains Apaches overlap those of the Sangre de Cristo or Jicarilla cultural pattern variant in the Arkansas River Basin?
- How far do Apachean trade networks extend as indicated by the presence of exotic materials and/or artifacts?

Technology

Technological aspects of Protohistoric period adaptation are poorly understood. Three factors contribute greatly to this situation. First, relatively few sites are confirmed as Protohistoric in affiliation; second, these few sites are most often associated with small artifact samples; and third, Athapaskans have been inclined to adopt attributes of neighboring cultures. Therefore, few Protohistoric collections are available for technological analyses, and distinctive assemblage attributes and/or individual artifacts are difficult to discern. Projectile point morphologies that are exclusively diagnostic of Apachean bands have not been identified. The effects of artifact curation must be considered, since a range of Archaic and Late Prehistoric stage point types has been recovered from Protohistoric sites. Currently, ceramics constitute the only class of artifact seen as diagnostic of Apachean occupation. However, the difficulties involved in distinguishing Apachean-manufactured pottery from that produced by neighboring cultures using identical clay sources are acknowledged. Overall, petrographic analyses for both lithic and ceramic assemblages would greatly enhance technological research of the Protohistoric period.

- What clay and lithic sources were utilized by Protohistoric period groups present in the Arkansas River Basin?
- What are the baseline technological trends in Apachean lithic tool production, e.g., are minimally modified flake tools emphasized over formal bifaces?

- Are so-called two-hand manos and trough metates associated with Protohistoric period occupation in the Arkansas River Basin?

- What attributes distinguish Apachean bone and shell tool/ornament assemblages from those of other cultures?

- Which projectile point form is most characteristic of Protohistoric period occupation?

- Can Apachean micaceous pottery consistently be distinguished from that manufactured by Rio Grande Puebloans?

Settlement and Subsistence Strategies

Research about the spatial distribution of various settlement types of the Protohistoric Apachean is currently restricted by the simple lack of sites that can be reliably assigned to this period. Although more permanent settlements are known to occur in surrounding regions, Protohistoric sites in the context area suggest an association with highly mobile bands. Arkansas River Basin Apachean sites tend to be tipi rings and rockshelters distributed along major watercourses, but are generally not associated with deep canyon settings. The Van Bremer Arroyo/Burke Arroyo sites at the PCMS, for example, are situated in areas where the drainages flow through rolling, open plains. Both rockshelter and tipi ring occupations with associated Apachean ceramics have been recorded in proximity to one another in this same PCMS locale. However, contemporaneity has not been established by chronometric data, and furthermore, any functional distinctions among these sheltered and open sites cannot be confirmed with available data sets. Regional differences (e.g., Purgatoire River vs. Arkansas River locales) in site type and site location need to be examined adequately. The discernment of large-scale regional distinctions among context-area Apachean sites is currently restricted to ceramics.

- What is the evidence for the presence of more sedentary, long-term, residential bases in the Arkansas River Basin during the Protohistoric period, and are such sites restricted to a particular region?

- What is the range of variability in site location during the Protohistoric period?

- What is the functional relationship, if any, between rockshelter and tipi ring sites in the context area?

- What regional variability is apparent in Protohistoric period settlement patterns within the context area?

Archaeological and ethnohistorical data indicate that although Apachean subsistence was primarily oriented toward hunting bison and gathering of various wild plant foods, horticultural activities increased throughout the Protohistoric period. Much of this information, however, is obtained from areas surrounding the Arkansas River Basin. Little subsistence information is available for Protohistoric sites in the context area. Although hunting and gathering can certainly be inferred from materials associated with context-area sites of this period, evidence suggestive of horticulture has not been recovered. The lack of comprehensive faunal data notwithstanding, there are currently no indications that bison procurement and processing was emphasized in the context area during the Protohistoric period.

- How closely does archaeological evidence correspond to early historical accounts of Apachean subsistence practices?

- What is the evidence for Protohistoric bison procurement and processing sites in the Arkansas River Basin?

- What is the range of wild plant resources utilized by Protohistoric period populations?

- What is the evidence for Protohistoric horticulture in the Arkansas River Basin?

- What, if any, are the regional differences in the Protohistoric period economy within the context area?

Overall, Protohistoric period Apachean architecture exhibits considerable morphological variability. Central Plains and northeastern New Mexico settlements include more permanent structures that resembled semisubterranean plains earth lodges and adobe-walled "pueblos," respectively. For reasons not yet established, Protohistoric structures in the Arkansas River Basin are restricted to spaced rock walls believed to be reflective of tipi locations. However, such architecture may also be associated with functions not related to temporary domiciles; furthermore, these types of structure may have considerable temporal depth. Additional block excavation and analysis would be required to define the full range of morphological variability associated with spaced stone walls. Further investigation will also result in expansion of the meager chronometric database that exists for this unique form of architecture. Questions pertaining to the variety of functions associated with such structures, and their temporal range, can then be addressed adequately.

- Are forms of Apachean architecture other than spaced stone circles present in the Arkansas River Basin?

- When did tipi rings or spaced stone circles first appear in the Arkansas River Basin?

- Are earlier, spaced stone circles smaller than those of later, Apachean occupations, i.e., is there a distinction in tipi rings of the dog and horse travois era?

- What is the evidence to indicate that spaced rock walls were associated with functions other than holding down the lodge covers of tipis?

Geomorphology and Paleoclimates

Because of the significant demographic changes in the context area during the Diversification period–and particularly at the end of the period, when regional abandonment apparently occurred–the importance of paleoclimatic reconstruction during Protohistoric times remains high. It is unknown if climatic amelioration rendered the area habitable once again, or if Protohistoric nomads were simply better adapted to a marginal environment than were semisedentary peoples of the Diversification period.

- How is the so-called Little Ice Age manifested in the context area?

- What is the timing of the onset of cooler and wetter climatic conditions, and does it correspond with Protohistoric reoccupation of the context area?

- What geomorphic processes were predominant during the Protohistoric period, and how widespread were they in the context area?

- Do recent landforms correspond to the Little Ice Age, e.g., stream terrace deposits, that might be consistently associated with Protohistoric site locations?

- Did reversion to a more mesic climate affect the numbers and distribution of bison in the plains portion of the context area?

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