Chapter 6

LATE PREHISTORIC STAGE (A.D. 150-1540)

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CULTURAL BACKGROUND

For the following discussion of the post-Archaic cultures in the Platte River Basin, the Ceramic stage of Eighmy (1984) has been replaced with the Late Prehistoric stage, patterned after the Late Prehistoric period defined by Mulloy (1958) and Frison (1978; 1991a). Others have rightfully pointed out that it is the uncritical use of taxa from various taxonomies that has given the prehistoric taxonomy currently in use in eastern Colorado a somewhat frankensteinian quality, most obviously that of the post-Archaic period (see Butler 1988). However, logic dictates that it makes more sense to acknowledge the greater importance of a continued reliance on an economic base of hunting and gathering than to characterize a cultural evolutionary stage on the introduction of a single technological innovation such as ceramics that while important, does not have a profound impact in the overall subsistence system. The term "Late Prehistoric" for describing post-Archaic stage people has also found greater use in the mountain subarea of the Platte River Basin, where the use of terms such as "Ceramic" and "Formative" have been thought to be inappropriate in the discussion of the continuation of what are in essence Archaic settlement and subsistence patterns. Even with the apparent addition of limited horticulture on the Colorado Piedmont, the settlement and subsistence systems in use in these areas were little changed from the previous Archaic stage.

Use of the term "Late Prehistoric" also does not elevate in importance the introduction of ceramics over that of the introduction of the bow and arrow into the area, the bow being a technological innovation that eventually became widespread in its distribution, unlike ceramic technology. Small corner- and side- notched points have been used as index fossils in both the mountains and plains to define the Late Prehistoric stage, and are much more common in artifact assemblages than ceramics throughout the Platte River Basin. Figure 6-1 contains illustrations of projectile points representative of the Late Prehistoric stage. Elevating the term Late Prehistoric from a period name to the level of an evolutionary Stage designator in a hierarchical taxonomic system allows for the continued use of Early Ceramic period and Middle Ceramic period within this stage. These periods are useful taxa, in that they acknowledge the demonstrated cultural relationship between people of the Western Plains and the ceramic cultures of the Central Plains, where the Early and Middle Ceramic periods are also recognized cultural taxa defined by similar cultural and temporal criteria. The Early Ceramic period is defined primarily by the Woodland culture and Woodland variants throughout the Midwest and into the Great Plains, and the Middle Ceramic period is defined by the development of the Central Plains tradition. The use of the Late Prehistoric stage is also consistent with the taxonomy proposed by Zier and Kalasz (1999) for the Arkansas River Basin, although periods within this stage in the Arkansas River Basin differ from those used in the Platte River Basin, based on the obvious cultural differences between the two areas.

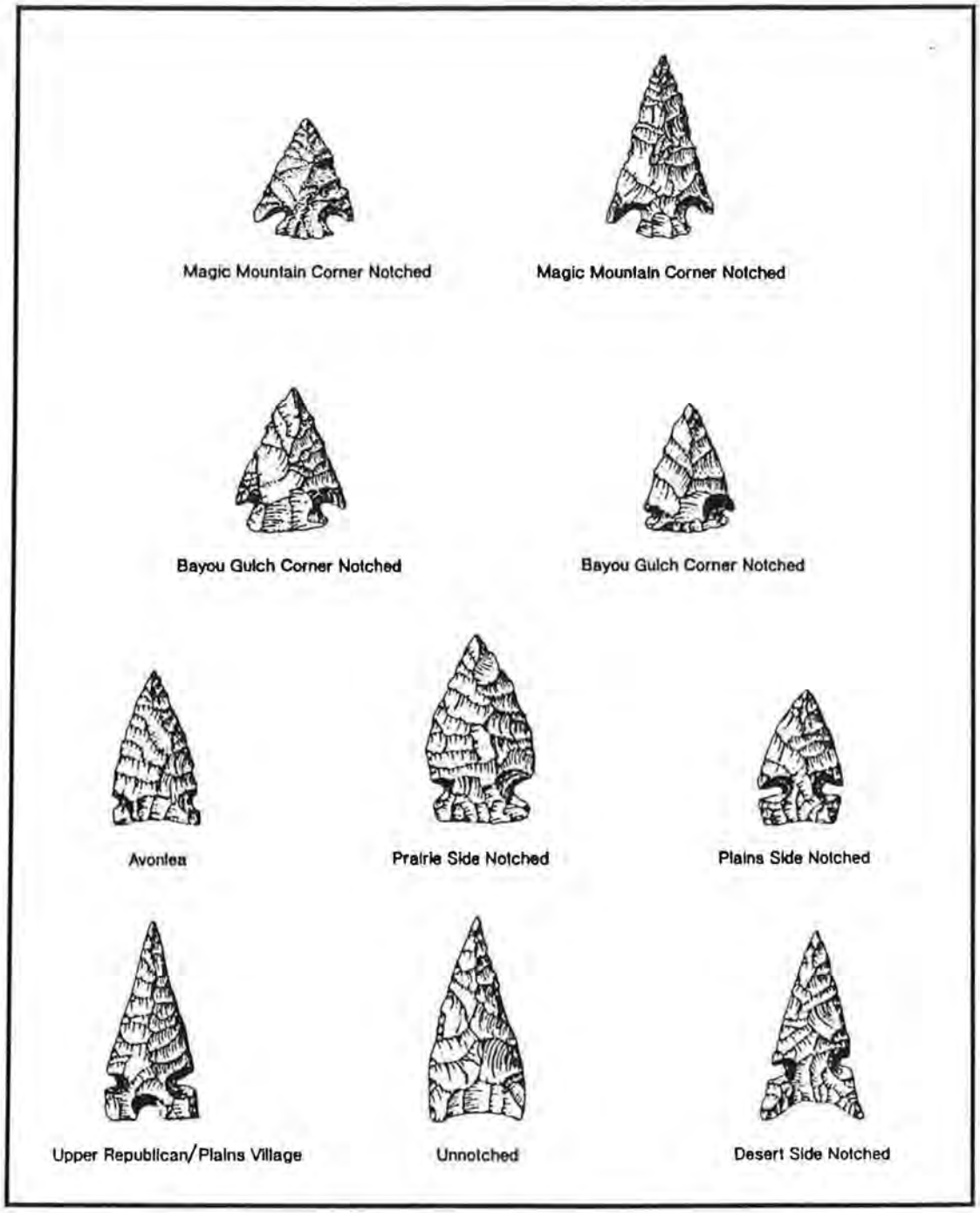

Figure 6-1. Late Prehistoric projectile points.

In other areas of North America, the appearance of ceramics in the archaeological record heralds the arrival of the Formative stage, and with it an entire suite of new, interdependent adaptations, such as an increased reliance on domesticated plants and food production. This reliance encourages and usually accompanies a gradual movement away from living in small, highly mobile nomadic groups to a more sedentary life, eventually leading to clustered populations living most of the year in villages of more permanent structures. Village life raises the profile of these groups within the archaeological record, with pithouse depressions, extensive middens and storage features, and a general increase in the amount and variety within the artifact assemblage. In the Platte River Basin, the changes are much more subtle, which is in keeping with the dryer and therefore marginal (as far as reliable horticulture is concerned) climate that is encountered as one moves west and gains elevation from the more moist and horticulturally favorable Central Plains to the High Plains, eventually moving into the rain shadow of the Rocky Mountains.

Occurrence of ceramics in artifact assemblages is the characteristic that distinguishes components of the Early Ceramic period from otherwise similar if not identical assemblages dating to the Late Archaic period. The present assumption is that the introduction of the bow and arrow to eastern Colorado is evidenced in archaeological contexts by the presence of smaller, lighter, corner-notched projectile points with relatively narrow neck widths. Because the timing of this technological innovation seems to coincide closely with the introduction of ceramics, the presence of these small points in an assemblage is also used to distinguish Archaic from Late Prehistoric components. However, the seeming coincidence of larger dart points and smaller arrow points in components dating to the initial few centuries of the Early Ceramic period suggests that these different technologies may have been used side by side for a certain period of time before the bow and arrow superseded the atlatl and dart. Therefore, corner notched dart points are not exclusively assignable to the Late Archaic period, although no demonstrably single component sites contain ceramics and dart points exclusive of arrow points.

The term "Plains Woodland" has for some time been the center of a certain amount of controversy as it is used in Colorado. Some critics of the term like to point out that the term itself is an oxymoron, that there are no woodlands on the plains. This fact is not in dispute, but it should be noted that the term does not refer to a vegetation community or a geographic region, but to a cultural tradition with marked similarities to cultural manifestations of the Middle Woodland (500 B.C.-A.D. 500) and Late Woodland (A.D. 500-1000) periods in the east and Midwest (O'Brian 1994). The similarity between the Woodland cultures and the Plains Woodland has been recognized in the Great Plains since the 1930s (Wedel 1986:81). Direct connection with the Hopewell of the eastern woodlands is represented by a Middle Woodland complex centered in the Kansas City area. Exotic materials from Kansas City Hopewell sites such as copper (Lake Superior) and obsidian (Yellowstone National Park) indicate that the people living at these sites participated in the greater Hopewellian interaction sphere, centered in Illinois and Ohio. Also associated with the Kansas City Hopewell are stone-vaulted burial mounds in which cremated remains were interred (O'Brian 1994:202-203). Two undated burials excavated at a site in Red Willow County in southwestern Nebraska contained artifacts of sheet mica (often associated with Hopewell burials, sometimes carved into elaborate geometric or representative patterns), native copper, shell beads, red ocher, chipped stone (including a Hopewell-like projectile point), and a marine shell gorget similar to those associated with midwestern Archaic horizons. It is unknown if these burials are Archaic or Hopewell in affiliation (Wedel 1986:91). These burials are located approximately 130-160 km (80 to 100 mi) downstream from the Colorado state line.

Burial mounds in the lower valley of the Republican River in Kansas, south of the Nebraska state line, that contain primary flexed and extended burials, secondary bundle burials, scattered secondary disarticulated remains, or fragmentary cremated remains are designated the Schultz focus or phase; they are thought to be related to the Kansas City Hopewell complex (Wedel 1986). Burial accompaniments were included haphazardly within mound fill and included disk beads manufactured from freshwater mussel shell, tubular bone beads, some with incised annular or spiral patterns, beads made from marine shells such as conch and *Olivella* shell, pendants manufactured from freshwater shell, unmodified shell, and corner-notched and stemmed types of arrow and dart points. In addition to the above materials, the James Younkin mound on the Republican River also contained 15 cone-shaped bone beads manufactured from deer toe bones, similar to artifacts found at the Hazeltine Heights and Lena Gulch burials (see below). Some of these mounds contain slab walls somewhat reminiscent of more the more complex dry-laid, masonry-chambered vaults in Kansas City Hopewell burial mounds (Wedel 1986:82-83). The question remains open of whether the Schultz phase and the Kansas City Hopewell are contemporaneous Middle Woodland manifestations or if the Schultz phase is a Late or Plains Woodland phenomenon (O'Brian 1994:207). Upstream on the Republican River in Nebraska, the camp and burial sites without mounds and with a "somewhat more limited material culture inventory" (Wedel 1986:81) are assigned to what is variously called the Keith focus, phase, or variant.

The Keith focus was defined by Kivett (1949, 1953) during his work in the Republican River valley of south-central Nebraska. The Keith focus, which recently is more commonly referred to as the Keith variant (Adair 1988) or the Keith phase (O'Brian 1994; Wedel 1986), was defined and distinguished from other Woodland foci on the basis of ceramics. The calcite-tempered ceramics are described as thick-walled, wide-mouthed jars with direct rims and pointed or slightly flattened bases, the exteriors of which are covered with parallel, fine, vertical cord marks. Habitation structures are described as shallow basins with amorphous, informal central hearths and superstructures of poles covered by mats, hides or thatch, that are grouped in small villages or hamlets, seldom numbering more than a half-dozen per site (Kivett 1949:282; Wedel 1986:85). Projectile points are small, well-manufactured, corner-notched or stemmed arrow points; the edges of some of these points are serrated. Burials are similar to those described for the Schultz phase described above, except for the absence of mounds. Burials ranged from flexed, or less commonly, extended primary interments to secondary interments, either as bundles or as scattered elements, some exhibiting evidence of burning. Burials recovered from sites in the upper Republican River valley were interred one or more in individuals pits, with some ossuaries containing 60+ individuals representing multiple interment episodes of multiple disarticulated or semiarticulated individuals (Kivett 1949:283, 1953). Accompaniments in some ossuary sites included thousands of shell disk beads, disk bead blanks in various stages of manufacture, tubular bone beads, shell pendants, pigment, rabbit teeth, and chipped stone artifacts. Ceramics are rare and fragmentary, suggesting inclusion as incidental pit fill (Kivett 1953). Keith phase or variant sites are found throughout south-central Nebraska along the Republican River and into central and western Kansas, along the Solomon, Saline and Smoky Hill rivers (O'Brian 1994:208).

Just as the Plains Woodland tradition has been described as an attenuated version of Woodland cultures of the eastern woodlands of Ohio and Illinois, so has the Plains Woodland of Colorado been recognized as an attenuated version of Plains Woodland variants, most often the Keith phase, and occasionally variants from farther east, such as the Valley phase of southeastern Nebraska. Dispersal of Woodland cultural traits or technologies or both to Colorado are possibly

related to the extensive trade network associated with acquisition of exotic materials for Hopewell sites to the east, including Knife River flint from western North Dakota and obsidian from the Yellowstone National Park area in northwestern Wyoming (Manson 1998:386), and possibly Madison Formation chert and Morrison Formation quartzite from eastern Wyoming (Boszhardt 1998).

In general, many more campsites dating to the Early Ceramic period seem to have been occupied for longer periods of time and/or occupied with greater regularity than during the preceding Late Archaic period, components of which are often found beneath or intermingled with Early Ceramic cultural material at the same campsites. As discussed below, the increase in radiocarbon ages that begins in the terminal Late Archaic period is probably partly a result of an increase in population, but is also probably a result of an increase in size and complexity of Early Ceramic campsites. This, in turn is directly related to decrease in mobility and the concomitant increase in the duration of occupations at fewer sites, resulting in an increased number of features at these sites. This would lead to a general increase in radiocarbon ages for the period, and an increase in the number of ages for particular sites. Site preservation is also an important issue that could be influencing the relative frequency of Early Ceramic radiocarbon ages, although the occurrence of multicomponent sites and the relative size and complexity of the Late Archaic and Middle Ceramic components occurring at the same sites with Early Ceramic components suggest that the observed differences among these components are related to cultural or population differences, or both. However, a difference in settlement patterns between the Early Ceramic period and the Late Archaic and Middle Ceramic periods could result in differential preservation or visibility, and should be considered as a possible alternative explanation for the difference in the relative frequency of radiocarbon ages.

Although knowledge of Early Ceramic architecture has increased substantially since the last context was written, there still is no indication of small villages similar to those documented farther east on the Central Plains in Kansas and Nebraska. There is even less information regarding Middle Ceramic architecture in the Platte River Basin. Also unlike populations farther east, there is still little definitive evidence for horticulture, other than a few occurrences of corn as macrobotanical remains or *Zea mays* pollen in Early and Middle Ceramic contexts. Some burials and their accompaniments from Early Ceramic components have similarities to Plains Woodland burials from Kansas and Nebraska. In general, the material culture of the Early Ceramic period of Colorado resembles a somewhat abbreviated form of the material culture of the Plains Woodland culture of eastern Kansas and Nebraska, with whom they shared a hunter-gatherer subsistence base, certain technologies, and some aspects of burial ritual, the latter of which indicates more than any other similarity in material cultural the possibility of a shared belief system and shared identity. This pattern was long lived in eastern Colorado, especially along the foot of the Front Range. A relatively unmodified, generalized Early Ceramic/Plains Woodland pattern, represented by open campsites like Rock Creek and Bayou Gulch, survived to ca. 1150 A.D., a time when the Central Plains tradition had supplanted Plains Woodland variants on the Central Plains.

Toward the end of the Plains Woodland/Late Woodland period about A.D. 900-1000, climate on the Central Plains became more moist about the time of the Neo-Atlantic climatic episode, allowing what had been the seemingly sporadic and economically marginal cultivation of corn and possibly other cultigens during the Early Ceramic period to become a much more integrated part of the established hunting-gathering subsistence strategies of people living on the plains. This new pattern of subsistence and settlement and related changes in material culture is

recognized as the Central Plains tradition (O'Brian 1994:212-213; Wedel 1986:98). The Upper Republican culture or phase (formerly aspect) of the Central Plains tradition is most relevant to northeastern Colorado prehistory, and is probably best known from excavations at the Medicine Creek Reservoir (Kivett 1949; Kivett and Metcalf 1997; W.R. Wood 1969). Environmental change probably contributed to the development of the Upper Republican phase. The changes in subsistence that came about with the addition of more productive horticulture and a greater reliance on bison than the previous Woodland groups, were accompanied by changes in settlement pattern, with more permanent earthlodge habitation structures that were grouped in small villages or hamlets on bluff tops, gently sloping hillsides or the terraces of the smaller tributaries of the Republican River. The changes in subsistence and settlement pattern were accompanied by changes in material culture, which included side-notched projectile points; globular, shouldered ceramic vessels with collared, flared, or direct rims; diamond-shaped, beveled-edge bifaces; and bison scapula hoes used for cultivation (Wedel 1986:100-108). The core area of the Upper Republican phase on the Central Plains is, understandably, the upper reaches of the Republican River Basin, with sites also found in the valleys of the Solomon and Saline rivers in Kansas, and the valleys of the Platte River and the North, Middle, and South Loup rivers in Nebraska (O'Brian 1994:212). Based on evidence in northeastern Colorado, Upper Republican sites are also found in the lower South Platte River Basin (see Dominguez 1986; J. J. Wood 1967; W. R. Wood 1971a).

The differences between the Middle Ceramic period in the Platte River Basin in Colorado and the Central Plains to the east is more striking than the differences exhibited between these areas during the Early Ceramic period. Small, side-notched projectile point forms and shouldered, globular pots with partially to completely obliterated cord marks and flaring rims similar to Central Plains tradition ceramics appear in open and sheltered campsites in the eastern portion of the Platte River Basin. As mentioned above, a version of the generalized Plains Woodland pattern continues along the Front Range to 1150 A.D., with the addition of innovations in ceramic technology related to the Central Plains tradition. Instead of populations aggregating in villages, campsites dating to the Middle Ceramic period contain no indications of even semipermanent architecture (with the possible exception of the Buick site, discussed below), and population (as suggested by the frequency of radiocarbon ages) continues to decrease until the close of the fifteenth century, near the end of the period.

The following site descriptions are not meant to represent an exhaustive list of all of the Early or Middle Ceramic components in the Platte River Basin, but represent the majority of the chronometrically dated sites and other important undated sites that have over the years been cited repeatedly and have subsequently become important structural elements in the culture history framework of the Platte River Basin. The point was not necessarily to be inclusive of all information available for each site, but instead these descriptions should be looked at as a tool used to inform the researcher of the information available for each site and whether the primary references could provide additional useful information. To this end, several subsections are also provided that include additional, detailed information on topics that are particularly germane to the discussion of the archaeology of the Early and Middle Ceramic periods, and for which the amount of information available has grown since the last prehistoric contexts were written. These sections are provided so that researchers have the ability to find all of the information relevant to these particular topics. These subsections include Horticulture, Burials, and Habitation Structures, and are found at the end of the general site descriptions.

In the following section, in discussions of absolute dates, all references to "radiocarbon ages" or simply "ages" refer to uncalibrated ages B.P. All references to "dates" refer to radiocarbon ages that have been calibrated using the bidecadal curve within the calibration program of Stuiver and Reimer (1993a, 1993b), with the default lab error multiplier function. In site descriptions, dates are given as a range between the 2-sigma extremes. In the discussion section, these dates are rounded off to the nearest decade, as per the suggestion of Stuiver and Reimer (1993b:22). Where more than one radiocarbon age is available for one stratigraphic or cultural unit, reference to "bracket dates" incorporate the period of time that is bracketed by the earliest of all of the early dates and the latest date of all of the late dates given within the 2-sigma range for all of the calibrated dates within the dated stratum.

EARLY CERAMIC PERIOD, A.D. 150-1150

More Early Ceramic components are recorded for the Platte River Basin than for any other period (Figure 6-2), and 43 percent (n=195) of the radiocarbon ages for this area (n=451) fall between 2000 and 950 B.P. This number climbs to 224 (50 percent) when radiocarbon ages from the late Early Ceramic period (950-800 B.P.) are included. This observed increase in frequency of radiocarbon ages begins about 2200 B.P., toward the end of the Late Archaic period and peaks between 1500 and 1100 B.P. (See Figure 1-2). After this peak, the frequency of radiocarbon ages decreases through the end of the period at 800 B.P. and continues to decrease through the Middle Ceramic period until approximately 400 to 350 B.P. There, the curve seems to stabilize at a level comparable to that prior to the original Late Archaic increase for several centuries before decreasing during the last one hundred years. Although it is an imperfect measure, and is in part a factor of geomorphic processes and site preservation, relative site visibility, and the number of large sites with multiple ages, this curve of the population of radiocarbon ages should reflect trends in human population through time.

Figure 6-3 represents all of the Late Prehistoric radiocarbon ages for the Platte River Basin, and Figure 6-4 breaks down the frequency of radiocarbon ages by subarea. It is interesting to see the progression of the major mode in frequency to a point later in time as elevation decreases. The peak in age frequency for the mountains seems to occur between 1600 and 1500 B.P., the mode for the hogbacks/foothills is between 1300 and 1200 B.P., and the mode on the Plains is between 900 and 800 B.P. One possible explanation is that this shift may represent a slight displacement of population from higher to lower elevation as dry climate ameliorated at the end of the Sub-Atlantic climatic episode and effective moisture increased on the eastern plains of Colorado coincident with the beginning of the Scandic episode. The mode between 900-800 B.P. may be the result of a continued shift to lower altitude and population growth as a response to increasing effective moisture on the plains associated with the Neo-Atlantic episode. The relatively rapid drop in radiocarbon age frequency on the plains after 800 B.P. without a synchronous increase in the hogbacks/foothills and in the mountains suggests a decrease in population in response to increasing aridity during the Pacific episode.

Because of the large number of absolute ages, the following descriptions of Early Ceramic components are skewed toward dated sites. The descriptions for sites that do not have associated absolute ages are primarily large, mostly well documented sites that contain one or more components that are cross dated and can be separated, and in which the relative chronology is well-defined. Of course, there are some exceptions to these rules, and these sites have been

included because of their previous wide use for comparative purposes. Site types listed in the OAHP database for the Early Ceramic period are open camp, open lithic site, open architectural site, sheltered architectural site, sheltered camp, quarry, burial, game drive, isolated find and/or combinations of the above. The criteria used define these site types are described in detail in Chapter 5 and are not duplicated here.

Early Ceramic Campsites

Plains

Agate Bluff Sites: Agate Bluff I, 5WL1478 Agate Bluff II (5WL1479, Porcupine Cave), Agate Bluff III (5WL1480, Fire Cave), Agate Bluff IV (5WL1481, Woodland Cave). These four rockshelters are found in a large bluff 8 km (5 mi) south of the Wyoming state line, in northwestern Weld County (Irwin and Irwin 1957). At sites I, II, and III most of the cultural material found was associated with Upper Republican components. All three shelters contained an upper, culturally sterile stratum, with one or two lower natural strata that contained artifacts and features. Because of the similarity in cultural materials and stratigraphy, the artifacts from all three shelters were described together. Though most majority of the recovered cultural material was attributed to Upper Republican components of the Middle Ceramic period, all three shelters contained a small amount of cultural material attributed to Woodland components, including small, triangular corner-notched arrow points that constituted 9-14 percent of the total number of classifiable points, and Woodland ceramics, designated Agate Cord-marked, that constituted 14 percent of the identifiable sherds. Agate Cord-marked was described as very similar to Ash Hollow Cord Roughened (Champe 1946), differing in only small details such as thickness. Although the relative frequency of Woodland diagnostic artifacts does increase somewhat with depth, the low total numbers of these artifacts compared to the high number of Upper Republican diagnostics make interpretation of this trend difficult. Cultural materials were mixed in all levels, and nondiagnostic artifacts could not be assigned to either component, but by extension, the majority are probably associated with the Upper Republican component. A single kernel of Dent corn was found 1.4 m (4.5 ft) below the surface, beneath rock fall from the overhang. Examination of the stratigraphic profile suggests that at this depth the corn would have been found close to bedrock, and that caution should be used in assigning this cultigen to either the Upper Republican or Woodland component.

Contrary to the pattern observed at sites I-III, most of the assemblage from site IV was assigned a Woodland affiliation. Stratigraphy was similar to that observed in sites I and III; of three natural strata, the uppermost Level 1 was culturally sterile, and the two lower strata (Levels 2 and 3) were separated by a thin, light-colored band of soil. Small, triangular corner-notched points were recovered from both Levels 2 and 3, and five larger (30-50 mm x 19-32 mm), expanding-stem barbed points were recovered from Level 3 alone. Because of their size, the latter points were thought to be dart points. Nineteen side-scrapers, 30 bifacial knives, 153 utilized flakes, one drill and 25 triangular tools of unknown function were recovered from all levels. Ground stone from all levels consisted of two manos, eight metate fragments, two abraders, and a small pigment grinding stone were recovered from all levels. Nineteen sherds of Agate Cord-marked were recovered in equal proportion from both cultural levels. Bone artifacts included eight tubular beads, one bone disk bead, a bead manufactured from a bison tooth, nine splinter awls, and a slightly curved section of elk rib that was used for cutting or smoothing. Several perishable items were also recovered, including pieces of arrow shaft from both cultural levels, a 50mm length of yucca fiber

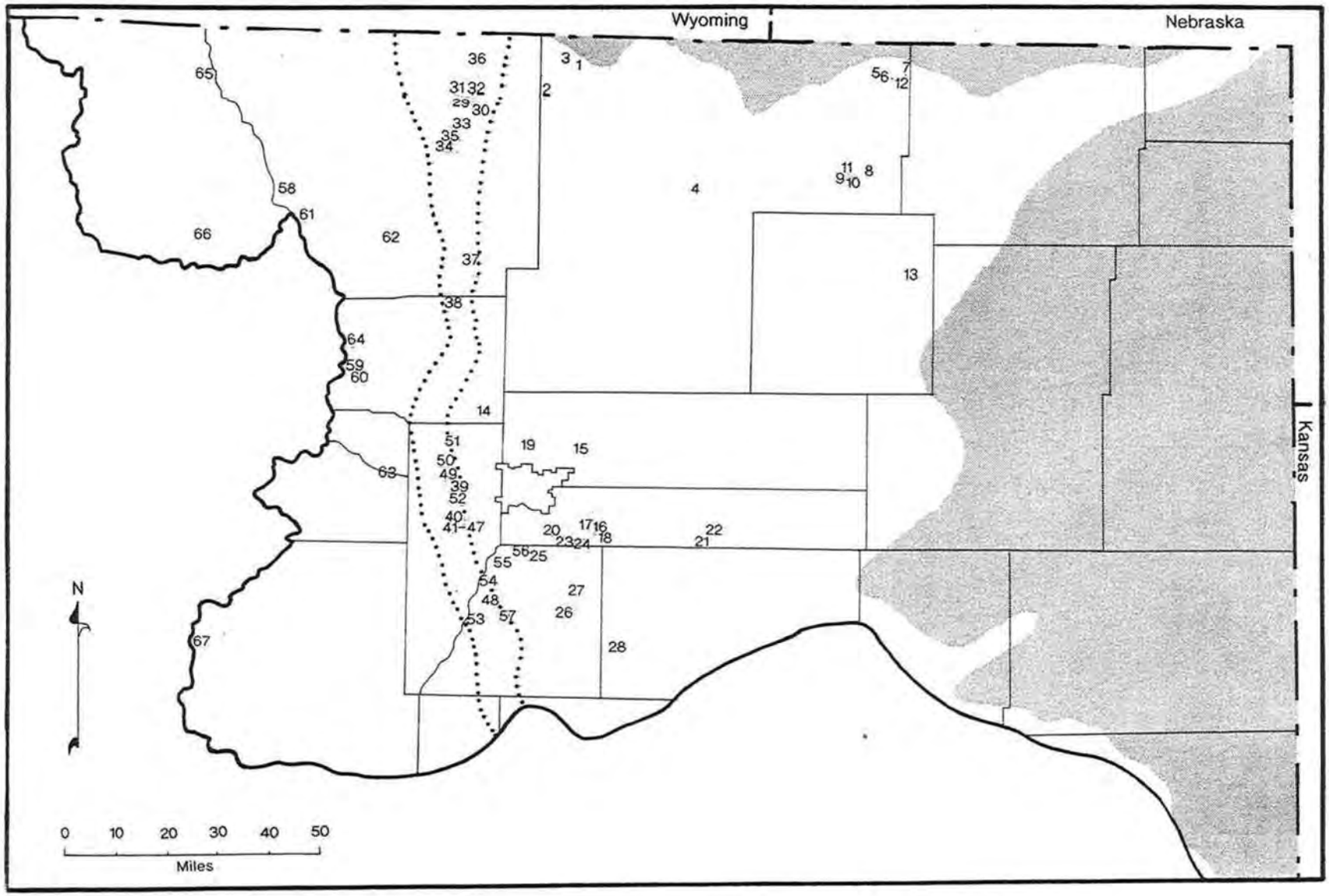

Figure 6-2. Distribution of Early Ceramic sites in the Platte River Basin.

Figure 6-2 (cont.) List of Early Ceramic Camps Shown on Map.

1. 5WL1478-5WL1480, Agate Bluff sites
2. 5WL45, Wilbur Thomas Shelter
3. 5WL101, Happy Hollow Rock Shelter
4. 5WL1483, Cass Site
5. 5WL27, Biggs Site
6. 5WL32, Uhl Site
7. 5LO1, Peavy Rock Shelter
8. 5WL38, Hatch Site
9. 5WL39, Wood's Lament
10. 5WL1997, Three O'Clock Shelter
11. 5WL1849, Hilltop Site
12. 5LO101, Dipper Gap
13. 5MR472, Friehauf Site
14. 5BL2712, Rock Creek
15. 5DV3017, Box Elder-Tate Hamlet
16. 5AH380, Senac Site
17. 5AH366
18. 5AH378
19. 5AM42, Hunt sites
20. 5AH48
21. 5AH2, Michaud A
22. 5AH3, Michaud B
23. 5AH416, Van Ness Site
24. 5AH258, Mee Site
25. 5DA450 and 5DA451
26. 5DA272, Franktown Cave
27. 5DA265, Bayou Gulch
28. 5EL2, Cliff Swallow Cave
29. 5LR252, Spring Gulch
30. 5LR104, Owl Canyon RS
31. 5LR284, Lighting Hill Site
32. 5LR144, Kinney Springs
33. 5LR1098
34. 5LR1102
35. 5LR1112
36. 5LR263, Lykins Valley Site
37. 5LR1085, Valley View Site
38. 5BL876, Indian Mountain
39. 5JF223, Magic Mountain
40. 5JF142, LoDaisKa Site
41. 5JF463, Dutch Creek Site
42. 5JF6, Willowbrook
43. 5JF321, Swallow Site
44. 5JF211, Falcon's Nest
45. 5JF148, Crescent
46. 5JF51, Bradford House II
47. 5JF52, Bradford House III
48. 5DA306, Window Rock Site
49. 5JF9, Hall-Woodland Cave
50. 5JF10, Van Bibber Creek Site
51. 5JF11, George W. Lindsay Ranch
52. 5JF63, Cherry Gulch Site
53. 5DA29, Dancing Pants
54. Glenn Scott Sites and
    5AH123, Helmer Ranch Site
55. 5DA124, Rainbow Creek
56. 5DA541, Jarre Creek Site
57. 5DA603, Jackson Creek
58. 5LR220, Joe Wright Site
59. 5BL65, Murray Site
60. 5BL69 and 5BL68
61. 5LR6, Flattop Mountain
62. 55LR1370, Bodes Draw
63. 5CC89, Twin Tunnels Site
64. 5BL94, Coney Lake Site
65. 5JA58, Muad'dib Site
66. 5JA1068
67. 5PA153

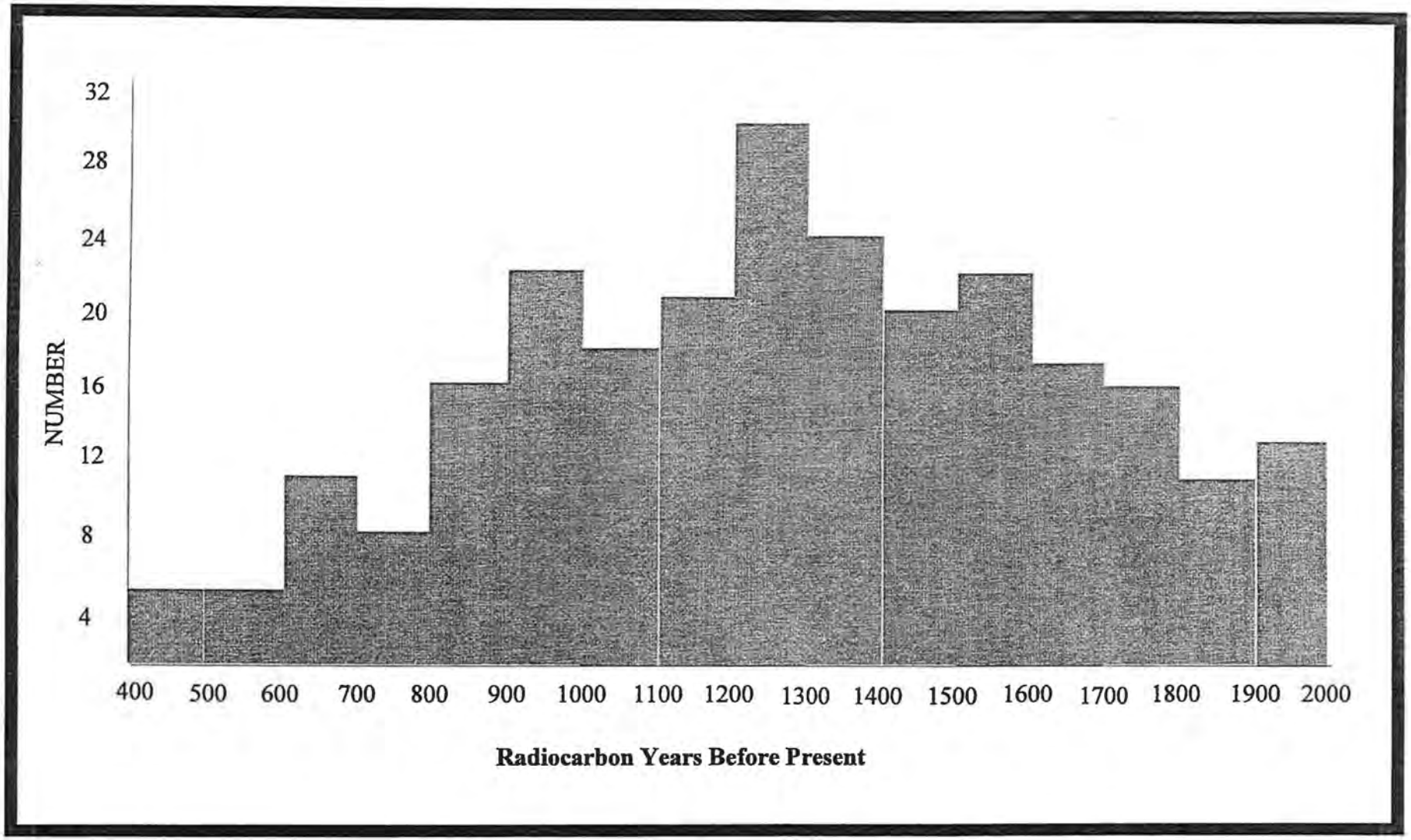

Figure 6-3. Frequencies of Late Prehistoric radiocarbon ages in the Platte River Basin.

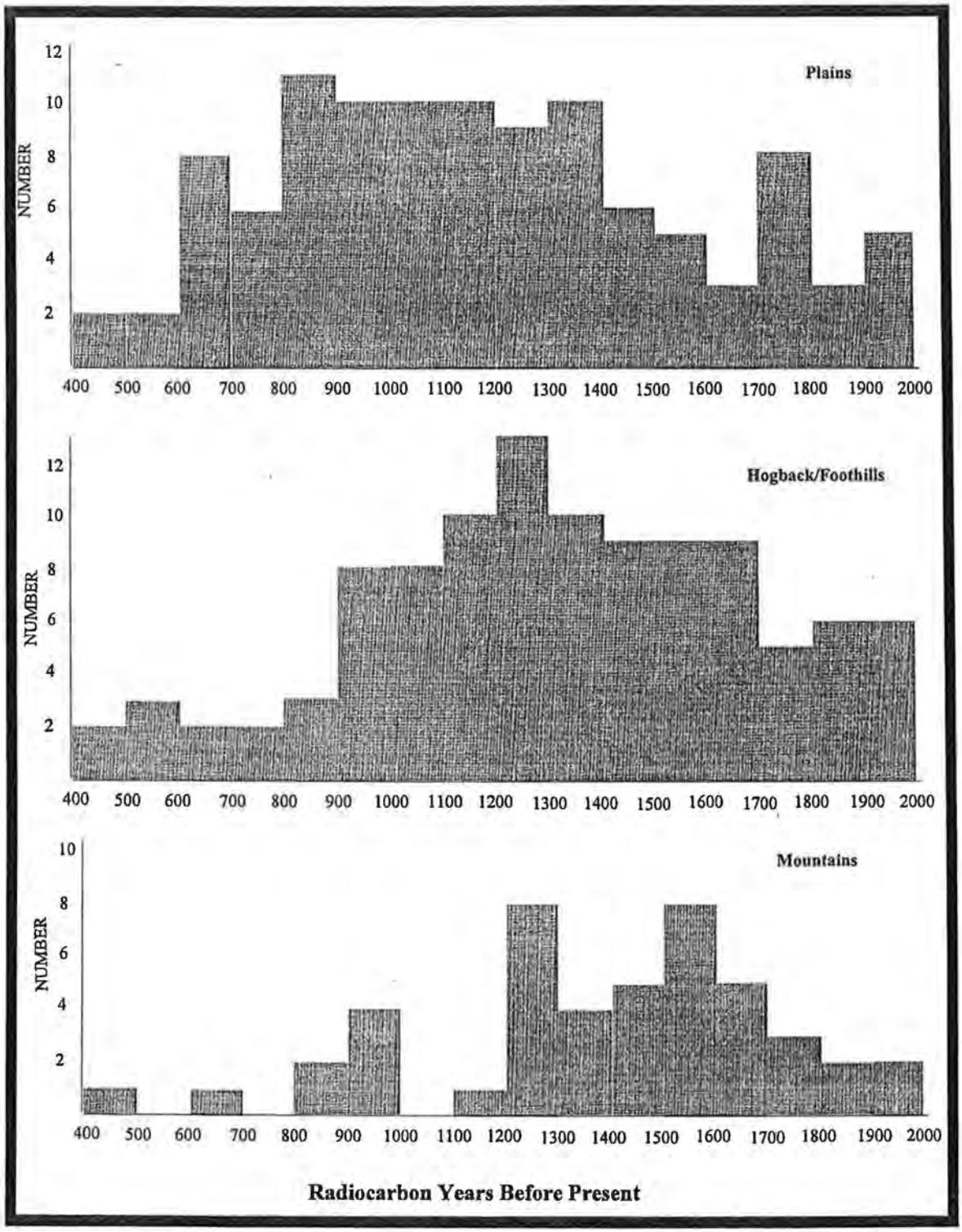

Figure 6-4. Frequencies of Late Prehistoric radiocarbon ages in the Platte River Basin by subarea.

rope and a short piece of yucca thought to be a piece of plaited basketry. Floral remains included sunflower, wax currant, a wild grape leaf, and yucca seeds and stems. Bison and elk were the most common faunal remains recovered, but pronghorn, prairie dog, woodrat or packrat, and mule deer bones were also recovered. One round piece of modified shell was also found. These materials were assigned to a new taxon the authors named the Ash Hollow focus, after Ash Hollow Cave in Nebraska (Champe 1946). This new focus was proposed by Irwin and Irwin (1957) to include the general Woodland sites that Kivett (1952) had assigned to an unnamed focus of the Orleans aspect.

Wilbur Thomas Shelter (5WL45). This site is a southwest-facing multicomponent rockshelter located 6 km (4 mi) southwest of Carr and 10 km (6 mi) from the Agate Bluff sites, in northwest Weld County (Breternitz 1971a). Twenty-three small, corner-notched projectile points with straight to convex bases were recovered in association with eight end scrapers, two gravers, a perforator, a drill, three knives, and two chopper/cores. Six manos were recovered from all levels, and none could be assigned to any one component. The two cord-marked sherds were thought to be associated with the "Parker Focus" of Withers (1954). No absolute ages are associated with any of the components at Wilbur Thomas. All of these materials were given a Woodland affiliation and compared favorably to the Woodland components at Magic Mountain and the Van Bibber Creek site, which had a radiocarbon age of 1050 ± 250 B.P., cal A.D. 541-1408 associated with the Woodland component of the Parker focus (Nelson 1969).

Happy Hollow Rock Shelter (5WL101). This site is located approximately 5 km (3 mi) northeast of Carr, in northwest Weld County (Steege 1967). The southeast-facing rockshelter is situated near the top of a bluff formed in what was thought in to be the Arikaree Formation, but is mapped as the Ogallala Formation (Tweto 1979). This site is approximately 5 km (3 mi) northwest of the Agate Bluff sites. These bluffs are all a part of the High Plains escarpment that forms the boundary between the Colorado Piedmont and the High Plains to the north and east. The site contains what is apparently three components within two natural strata that are overlain and underlain by culturally sterile strata. Most of the recovered cultural materials are probably associated with the Upper Republican component; however, three small, corner-notched points and four rim sherds were given a Woodland association. A hearth excavated into the basal clay stratum returned a radiocarbon age of 1270 ± 80 B.P., 2-sigma cal range A.D. 639-968. The base of a small, side-notched point was found in this hearth.

Cass Site (5WL1483). This open campsite is located in central Weld County, 6.1 km (3.8 mi) south of Briggsdale and 35 km (22 mi) northeast of Greeley (Kalasz et al.1992). The site is situated on the northern edge of the Colorado Piedmont, on a terrace that overlooks Crow Creek, an intermittent tributary of the South Platte River. Twelve classifiable projectile points were placed into eight types. Type 2 points are large, expanding-stem points associated with Late Archaic/Early Ceramic components. Type 3 points are small with contracting stems, and Types 4-8 are small to very small points with expanding stems. Types 3-8 are found regionally in Early Ceramic to transitional Early Ceramic/Middle Ceramic components. One Type 3 point, the Type 6 point and the Type 8 point all had serrated blade edges. Within the Cass site, a Type 4 point was found in proximity to CAI Feature 6, with an associated radiocarbon age of 1260 ± 70 B.P., 2-sigma cal range A.D. 653 (776) 962. Twenty-six sherds were recovered from the site, and the 21 classifiable sherds were placed into three cord-marked wares and one stamped ware. Ten of the sherds were recovered from contexts that included projectile point Types 2-5. These point types are generally designated as "Woodland" or Early Ceramic in the region. A total of 476 chipped stone tools exclusive of hafted bifaces (projectile points) were recovered from the site, including

early stage (n=74), midstage (n=16) and late stage (n=12) unhafted bifaces; scrapers (n=18); expedient flake tools (n=199); cores (n=29); bifacial or unifacial core tools (n=3); expedient cobble/pebble tools (n=115); one drill, and nine tools of undetermined category. The 6,879 unmodified pieces of debitage were divided into six flake types and two size categories, using a modified version of the analytical method presented by Sullivan and Rozen (1985). The faunal inventory was dominated by bison (68 percent by weight), followed by indeterminate artiodactyl, pronghorn, rabbit/hare, and small amounts of deer, coyote, rodents, and indeterminate large and small mammals. Charred macrobotanical remains recovered from flotation samples are limited to 82 goosefoot seeds, one sunflower seed, and one Compositae seed fragment. The Cass site is thought to represent a midstage lithic workshop, where locally procured tool stone was prepared for transport to other locations where the final stages of tool production occurred. Radiocarbon ages of 1460 ± 50 B.P., 2-sigma cal range A.D. 434 (612, 628, 636) 669 for CDOT Feature 2; 1370 ± 60 B.P., 2-sigma cal range A.D. 599 (662) 779 for Feature 4; 1260 ± 70 B.P., 2-sigma cal range A.D. 653 (776) 962 for Feature 6; and 1240 ± 80 B.P., cal A.D. 653-984 for Feature 1.

Biggs Site (5WL27). The cultural material at this open camp is exposed in several areas in the cutbank along an arroyo. There is a stone ring on the surface of the site, and an overhang above the site that was apparently not inhabited. Two of the four areas tested, Locations I and II, contained artifacts. A piece of mammal bone from Stratum VI, which was the major cultural stratum at Location II, returned a radiocarbon age of 1400 ± 90 B.P., 2-sigma cal range A.D. 452-790. Two unnotched projectile points, six corner-notched projectile points, and 33 body sherds were recovered from the site. The two sherds recovered from the surface of the site were from a vessel with extensively smoothed cord impressions; the other 31 sherds were from buried contexts and the exteriors were too eroded to determine surface treatment. Bison and pronghorn were the only species identified from the faunal remains (J. J. Wood 1967).

McEndaffer Rockshelter (5WL31). This multicomponent sheltered camp is in a large south-facing rockshelter. Although an Early Ceramic component is indicated by material culture, the majority of artifacts recovered from mixed cultural deposits were associated with the Upper Republican component. Five small, corner-notched points were recovered (additional information regarding artifacts is found in the Middle Ceramic section below). One group of sherds within the 243 sherds recovered was given an Early Ceramic affiliation. These sherds were from cord-marked vessels with vertical to slightly incurving rims. One of these vessels had a thickened conoidal base with impressions from a coiled basket. Faunal remains included prairie dog, cottontail, bison, and pronghorn. Human remains consisting of toe bones and teeth were found scattered through the deposits (J. J. Wood 1967).

Uhl Site (5WL32). The cultural material of this open campsite is buried in a south-facing shelf near the west end of a box canyon, 15 m below the rim of the caprock. Five natural stratigraphic units (I-V) contain five cultural Zones (A-E). Unfortunately, these zones do not all correlate directly with the natural stratigraphy. Although there is some overlap of diagnostic artifacts between different zones, Zone D in the upper part of Stratum V represents the Early Ceramic component at the Uhl site. Artifacts culturally and temporally diagnostic of the Early Ceramic component are not exclusive to Zone D, but frequencies of these types peak in this cultural zone. Artifacts diagnostic of Zone D include small, corner-notched arrow points (n=14) medium-sized, corner-notched dart points (n=14), and 150 cord impressed sherds, including 16 rims and rim fragments. These sherds are from vessels with vertical or diagonal cord impressions that have not been smoothed or obliterated and have vertical rims. Other artifacts include bifaces ("blades"),

end scrapers, retouched flakes, drills, and ground stone. The faunal assemblage was dominated by bison and pronghorn, with prairie dog, cottontail, jack rabbit, rattlesnake, turtle, pocket gopher, kit fox, and coyote also present. Zone D is bracketed by two dates, the lower one of 1755 ± 95 B.P., 2-sigma cal range A.D. 73-537 from Stratum V, and 1210 ± 220 B.P., 2-sigma cal range A.D. 415-1278 from a bone in Stratum III. J. J. Wood (1967) believes that ceramics first appeared in the cultural deposits between A.D. 50 and 300.

Hatch Site (5WL38). During the initial excavations at this open campsite, one stone ring was test excavated and a radiocarbon sample returned a Protohistoric Period age of 160 ± 95 B.P. Other excavations at the site recovered sparse material culture, including ceramic sherds representing an occupation below the Protohistoric component in Units II and IV (J. J. Wood 1967). Additional excavations by the University of Northern Colorado resulted in the recovery of additional, sparse, cultural material from two cultural strata, Units 3 and 4, that roughly correlate with Wood's (1967) Units III and IV (Brunswig 1996). Cultural material recovered from this component from both excavations included one side-notched, straight-base projectile point, one corner-notched projectile point, and 132 slightly obliterated, diagonally cord-marked body sherds. Four incurving rim sherds, thickened on the interior of the rim, recovered from Wood's excavations suggest that three or four vessels were present. Faunal remains included bison and pronghorn. A transitional Early- Middle Ceramic component is hypothesized for Unit 4. A radiocarbon age of 880 ± 50 B.P., 2-sigma cal range A.D. 1024-1277, was returned from a sample recovered from the lower part of Unit 4.

Wood's Lament (5WL39). This sheltered camp has been vandalized in the past, but three 1 x 1 m test units in undisturbed areas, however, allowed for the definition of seven natural stratigraphic units (1-7, from the top down). Early Ceramic material was recovered from Units 4 and 5 and consisted of one hafted biface with shallow corner notches similar to Butler's (1986) Bayou Gulch Corner-notched type. Other artifacts included one biface tip and one end scraper. A charcoal sample from the single hearth associated with the Early Ceramic component returned a radiocarbon age of 1070 ± 70 B.P., 2-sigma cal range A.D. 855-1150 (Brunswig 1996).

Three O'Clock Shelter (5WL1997). This multicomponent sheltered/architectural camp contains three components: late Plains Woodland, transitional Plains Woodland or Middle Ceramic, and Dismal River. Seven natural strata were recognized during the excavation of 11 m^2, and most of the cultural material was recovered from Units 5-7 (upper to lower). Unit 6 contained two corner-notched projectile points similar to Butler's (1986) Magic Mountain Corner-notched type, and the base of a projectile point with low side notches similar to Avonlea or Besant types, manufactured from locally available chert. Two radiocarbon ages of 920 ± 60 B.P., 2-sigma cal range A.D. 998-1261, and 1030 ± 80 B.P., 2-sigma cal range A.D. 784-1209, were associated with Unit 6. Unit 7 contained two small corner-notched projectile points similar to Butler's (1986) Magic Mountain Corner-notched type, and one projectile point with low side notches morphologically similar to Avonlea points, the latter manufactured from Dawson Formation petrified wood. Five cord-marked sherds were also recovered from Unit 7. A low, curving wall of piled boulders at least 3 m long and 40 cm high located just outside the drip line of the shelter was interpreted as the base of a lean-to. The base of this wall rested in Unit 7, and extended up into Unit 6. This wall probably served to anchor posts that extended onto the shelter wall that were covered with hides. Two fragmented kernels of Chapalote maize were recovered from Feature 6, a small ovoid trash midden located within the lean-to in stratigraphic Unit 7. Two radiocarbon ages are associated with Unit 7, 1420 ± 60 B.P., 2-sigma cal range A.D. 539-762, and 1510 ± 70 B.P., 2-sigma cal range A.D. 414-

662. An anomalously early radiocarbon age of 1150 ± 60 B.P., 2-sigma cal range A.D. 695-1019, was associated with Unit 5. Faunal remains include bison, deer, jack rabbit, pronghorn, elk, cottontail, prairie dog (burned bone), and canid (Brunswig 1996).

Hilltop Site (5WL1849). This multicomponent open camp/architectural site on a hilltop consists of two structures, a circular low stone wall 4 m in diameter with a shallow center depression (Feature 1) and a stone circle 2 m in diameter (Feature 2). Two cultural strata exposed in test units within Feature 1 pass beneath the base of the stones that make up the feature and are believed to predate construction of the feature. Unit 2 contained two unnotched, triangular bifaces with straight to concave bases, and one stemmed, corner-notched projectile point similar to Butler's (1986) Magic Mountain Corner-notched type. A radiocarbon age of 700 ± 70 B.P., 2-sigma cal range A.D. 1213-1410, is associated with Unit 2. Unit 3 contained one corner-notched dart point with a round base similar to Butler's (1986) Magic Mountain Type 4, usually found in Late Archaic to Early Ceramic components. A sample of charcoal recovered from Unit 3 returned an age of 1170 ± 70 B.P., 2-sigma cal range A.D. 688-1019 (Brunswig 1996).

Dipper Gap Site (5LO101). This site is located in northwest Logan County, approximately 37 km (23 mi) north of Stoneham, 13 km (8 mi) south of the Nebraska state line (Metcalf 1974). The site is situated on top of a butte on the southern margin of a valley that contains several springs. Three site loci were investigated, and in only one, the Crack, were Late Prehistoric diagnostic artifacts found. In the Crack, five major natural stratigraphic units (I-V, numbered from bottom to top) and two laterally discontinuous subunits (IIa and Iva) were identified. The Early Ceramic cultural materials were found within the upper part of Stratum IV, which was designated Cultural Zone B. Four small, triangular, corner-notched points were recovered from Occupation Zone B. Five bifaces in various stages of reduction, five end scrapers, one side scraper, two perforators, one spokeshave, seven retouched flakes and 1327 pieces of debitage complete the chipped stone assemblage. One mano and two metate fragments were the only ground stone artifacts recovered from Zone B. The only faunal remains were ground squirrel and marmot. No absolute dates were associated with this component.

Friehauf Site (5MR472). This multicomponent open campsite is situated on top of and within the stratified sediments of a large sand dune overlooking Beaver Creek, 7.2 km (4.5 mi) south of its confluence with the south Platte River in eastern Morgan County. The site is approximately 16 km (10 mi) west of the High Plains escarpment. As part of a University of Colorado field school in 1985, 15 2 x 2 m test units were excavated at the site, revealing cultural materials from occupations dating to the Middle and Late Archaic, Early Ceramic, Middle Ceramic and Protohistoric periods (Dominguez 1986). A series of buried A horizons was associated with increases in artifact frequency as well as with hearths. One thick, moderately well developed A horizon (Level XI) contained a large amount of cultural material including projectile points (corner-notched dart points, corner- and side-notched arrow points), tools, debitage, ceramics (vertical rim, cord-marked and collared rim with incised horizontal lines), ground stone, bone, and charcoal associated with Late Archaic, Plains Woodland, and Upper Republican occupations. A less well developed A horizon above Level XI (Level IX), also contained Upper Republican artifacts, as did the stratum between the two buried A horizons (Level X). In his investigations of eolian deposits in northeastern Colorado, Madole (1994, 1995) dated soil humus from Levels IX and XI. Humus from Level XI returned an age of 1380 ± 90 B.P., 2-sigma cal range A.D. 438-871; although the ratio of ^{13}C was not measured, and so the age was not corrected for isotopic fractionation. If this sample follows the trend observed for the other humus samples collected, this

conventional radiocarbon age would probably be 120-160 years older if it could be corrected (Madole 1994:484). Humus from Level IX returned a corrected radiocarbon age of 860 ± 90 B.P., 2-sigma cal range A.D. 998-1296.

Rock Creek Site, 5BL2712. This open multicomponent campsite is situated on the north bank of Rock Creek, 3 km (2 mi) north of Broomfield (Gleichman et al. 1995). The site contained evidence of Early and Middle Archaic components, as well as evidence of occupation during the Early and Middle Ceramic periods. As is the case for most multicomponent sites in the Platte River Basin, the components of the ceramic periods constitute the majority of the cultural materials recovered. Owing to mixing of the deposits, separation of the Early and Middle Ceramic components was not possible. Analysis of the artifact assemblage indicates that a variety of processing activities took place. Tools included hafted knives, scrapers, drills, bifaces and modified flakes. Twenty of the 23 classifiable projectile points recovered from ceramic-period contexts were small, triangular arrow points with deep corner-notches and pronounced tangs, some with serrated blade edges, that were classified as Hogback Corner-notched. Two side-notched and one triangular unnotched point were also recovered. Lithic raw materials included material available east of the Front Range, such as Parker (Dawson Formation) petrified wood, White River Formation silicates, and Coal Creek quartzite, and stone from mountain sources such as Kremmling chert, Trout Creek and Table Mountain jaspers, and Windy Ridge quartzite. Sources for the mountain lithic materials except Trout Creek are in Middle Park. Ground stone artifacts were manufactured from materials available at the foot of the Front Range such as Lyons sandstone, Coal Creek quartzite and Dakota sandstone. Ceramics were categorized as Plains Woodland and Upper Republican, the distinction being made primarily based on surface treatment, cord-marked versus obliterated cord-marked, because the assemblage was too fragmentary to determine vessel shape. Identification of tempering materials indicates that all of the ceramics were manufactured locally. Faunal remains with evidence of utilization included birds, prairie dog, cottontail, jack rabbit, and unidentified medium to large mammals, many bones of which were highly fragmented. Blood residue from bison, rabbit, deer and a canine was identified on five Ceramic Period projectile points. Floral resources utilized included the seeds of grasses, pigweed, milkvetch, goosefoot, prickly pear, purslane, bulrush, dropseed, and cocklebur; all of these are available in the late summer and fall. The highly fragmented state of the faunal remains suggested that the inhabitants may have been under nutritional stress, which may indicate winter occupation.

The Rock Creek site is hypothesized as representing a series of occupations by people of the Hogback complex people engaged in Benedict's (1992) rotary system of seasonal transhumance. The uniformity of the assemblage compared to the range of radiocarbon ages led to the conclusion that the transition between the Early and Middle Ceramic periods at Rock Creek was not defined by a cultural disjunction, but by simple change in artifact styles over the period A.D. 850-1300. Site function and subsistence changed little during this time. The people that inhabited the site during this time were indigenous to the Front Range and hogbacks/foothills transition zone and did not represent either hunting parties from Central Plains tradition villages or members of a residential population representing a modified Upper Republican culture. There was no stratigraphic or vertical separation between the Early and Middle Ceramic components, and the nine radiocarbon ages from these periods indicate a relatively uninterrupted series of occupations. The radiocarbon ages, all from hearths, are associated with the Ceramic Period occupations: 650 ± 110 B.P., 2-sigma cal range A.D. 1190-1450 from a stratigraphic sample in grid unit 50S/10W, SE ¼; 780 ± 90 B.P., 2-sigma cal range A.D. 1040-1400 from a stratigraphic sample from grid unit 50S/10W, NW ¼; 850 ± 70 B.P., 2-sigma cal range A.D. 1030-1290 from Feature 1; 920 ± 60

B.P., 2-sigma cal range A.D. 1010-1250 from Feature 14; 930 ± 70 B.P., 2-sigma cal range A.D. 990-1260 from Feature 16; 960 ± 70 B.P., 2-sigma cal range A.D. 970-1240 from Feature 17; 970 ± 70 B.P., 2-sigma cal range A.D. 970-1230 from Feature 7; 1080 ± 70 B.P., 2-sigma cal range A.D. 800-1110 from Feature 11; 1100 ± 100 B.P., 2-sigma cal range A.D. 770-1200 from Feature 29. Five of the nine ages were corrected for carbon isotope fractionation. Archaeomagnetic samples from Features 14 and 16 reinforce the radiocarbon ages associated with these features (Gleichman et al. 1995).

Box Elder-Tate Hamlet (5DV3017). This site was discovered during the survey of the site for Denver International Airport, northeast of Denver near the Airport Boulevard and E-470 interchange (Tate et al. 1989). This site contained (in addition to an ephemeral Middle Archaic component) both Early and Middle Ceramic components that are not stratigraphically separate (Tucker et al. 1992). Of the classifiable projectile points (n=23) recovered during survey, testing, and excavation, the majority (n=20) were small, corner-notched arrow points. Two corner-notched dart points, thought to have Archaic affiliation, and one Middle Ceramic Plains Side-notched point were also found. The small chipped stone assemblage included 14 bifaces and biface fragments, four choppers, one graver, seven retouched or utilized flakes and 471 pieces of debitage. Lithic raw materials were dominated by Dawson Formation petrified wood (81 percent of debitage, 62 percent of tools), with chalcedony, quartzite, and chert in decreasing order of abundance. Ground stone from the site included six manos, 35 mano fragments, 53 metate fragments, and one complete slab metate. The ceramic assemblage consisted of 93 sherds; 77 percent were classified as Early Ceramic Plains Woodland ware, and 23 percent were Middle Ceramic Upper Republican ware. Faunal remains were highly fragmentary, and 90 percent were too fragmentary for identification other than size of mammal. Identified species include deer, pronghorn, bison, canid, rabbit, prairie dog, and pocket gopher. The highly fragmented nature of the bones suggests marrow extraction and processing for bone grease. Charred macrofloral remains recovered from features include the seeds of goosefoot, amaranth, saltbush, wild rose, ricegrass and other grasses, sunflower, prickly pear, evening primrose, purslane, smartweed, cocklebur, and croton. Starch granules recovered from Feature C suggests that starchy plant parts, such as roots or tubers, were roasted.

Sixteen features, including 13 hearths and one fire-cracked rock scatter, were uncovered during testing and grid block excavation. In addition to these features, probably the most important aspect of this site is the presence of two shallow depressions that were interpreted as pithouses. The first of these, Feature 1, had associated radiocarbon ages of 960 ± 60 B.P., 2-sigma cal range A.D. 983-1222, and 1080 ± 100, 2-sigma cal range A.D. 719-1178, giving this feature a range of A.D. 1080-1222, or the transition between the Early Ceramic and Middle Ceramic periods. The other pithouse, Feature F, had associated radiocarbon ages of 1290 ± 90 B.P., 2-sigma cal range A.D. 608-968, 1330 ± 110 B.P., 2-sigma cal range A.D. 547-956, and 1360 ± 70 B.P., 2-sigma cal range A.D. 594-790, and an archaeomagnetic age range of A.D. 700-950, placing occupation of this feature within the Early Ceramic period. More than half of the sherds recovered from the site were from excavated features, and of that number, 85 percent were from the two pithouses. Of these, 83 percent of the sherds from Feature 1 were classified Middle Ceramic, and 82 percent of the sherds from Feature F were classified as Early Ceramic. Additional Early Ceramic radiocarbon ages from hearths were 1610 ± 90 B.P., 2-sigma cal range A.D. 243-642 for Feature G; 1460 ± 120 B.P., 2-sigma cal range A.D. 381-790 for Feature J; 1300 ± 60 B.P., 2-sigma cal range A.D. 645-884 for Feature C; 1180 ± 100 B.P., 2-sigma cal range A.D. 659-1029

for Feature B; 1170 ± 60 B.P., 2-sigma cal range A.D. 709-1006 for Feature M; and 1080 ± 90 B.P., 2-sigma cal range A.D. 775-1165 for Feature N.

Senac Site (5AH380). This open campsite is located on Senac Creek in western Arapahoe County, approximately 13 km (8 mi) southeast of the Aurora city limits (O'Neil et al. 1988). The site contains multiple components, the most intensively occupation was during the Early Ceramic period. This component was found in vertical cultural zones designated A-F from uppermost to lowest. Fifteen classifiable projectile points were recovered from Zones B though E, including 11 small to medium-sized corner-notched arrow points, two large, corner-notched dart points and two large to medium sized side-notched dart points. The dart points were recovered from Zones C and D, and the arrow points were recovered from Zones B through E. The chipped stone assemblage included six biface preforms, four biface blanks, 17 unclassified bifaces, one denticulate, two knives, one drill, two end scrapers, four side scrapers, five combination end/side scrapers, two scrapers, two spokeshaves, 160 utilized flakes, 31 retouched flakes, and 2,526 pieces of debitage, including 26 cores. Eighteen pieces of ground stone were recovered, including 11 metate fragments, one complete mano, one polishing stone and five indeterminate fragments. Cord-roughened ceramics (n=111, four rim sherds) were recovered from Zones A through F. There was no observable change in technology or surface treatment through time; all of the sherds were assigned a general Colorado Plains Woodland affiliation. Rims were vertical, and cord marks were vertical with a slight superimpression of diagonal marks. A mass of fired clay with added temper that was similar to clay and temper used to manufacture the pottery found on site was recovered from the edge of Feature 9. This artifact suggests that pottery was being manufactured on site. Bone artifacts included six awls, three beads, one shaft straightener, one grooved deer tooth, one fiber processor, two perforators, and three scrapers. Burned macrofloral remains from features suggests a high reliance on Cheno-Am seeds. Other charred floral materials included grasses, poverty weed, ball cactus, fragrant bedstraw, mallow family, and purslane. Utilized fauna consisted of bison, pronghorn, deer, fox, racoon, badger, bighorn sheep, rabbit, prairie dog, dove grouse, and turtle. The primary species hunted were pronghorn and deer, supplemented by prairie dog. The ungulates were procured off site and brought to the site as front and hind limb butchering units, where the meat was stripped and the bones broken for marrow extraction. At least three springtime occupations are indicated by the presence of fetal and neonate bone. Radiocarbon ages for the cultural zones are Zone A, 1070 ± 100 B.P., 2-sigma cal range A.D. 727-1201 from Feature 9; Zone B, 1060 ± 80 B.P., 2-sigma cal range A.D. 789-1165, from general Level 11; Zone C, 1380 ± 80 B.P., 2-sigma cal range A.D. 537-873 from Feature 12, 1560 ± 80 B.P., 2-sigma cal range A.D. 339 (538) 654 for Feature 13, 1030 ± 130 B.P., 2-sigma cal range A.D. 710-1278 from Feature 24, and 1190 ± 100 B.P., 2-sigma cal range A.D. 656-1026 for general Level 13; Zone D, 1620 ± 60 B.P., 2-sigma cal range A.D. 263-597 for Feature 7; Zone F, 1330 ± 70 B.P., 2-sigma cal range A.D. 608-881 for general Level 19. No radiocarbon ages were associated with Zone E.

Sites 5AH366 and 5AH378. Site 5AH366 is an open campsite situated on a hill overlooking Senac Creek to the northeast (Tate and Friedman 1986; O'Neil and Tate 1986). A stemmed dart point found on the surface e of the site was compared to MM 17 and assigned to the terminal Late Plains Archaic Period. Other tools observed on the surface were a biface blank, preform, side scraper, bifacial mano, and lithic debitage representing all stages of reduction and three different raw material types. A basin hearth with associated fire-cracked rock (Feature 1) was excavated in a test unit, and two samples of charcoal from this hearth returned radiocarbon ages of 1160 ± 80 B.P., 2-sigma cal range A.D. 679-1023, and 1200 ± 70 B.P., 2-sigma cal range A.D. 670-998.

Burned bone, a petrified wood core, two small pieces of ground stone, and three pieces of petrified wood shatter were the only artifacts associated with the feature.

Site 5AH378 consisted of bison bone, a charcoal lens, and a hearth (Feature 3) exposed in the cutbank of Senac Creek, within what was judged to be the Piney Creek alluvium (Tate and Friedman 1986). A hammerstone and possibly a pecking stone were apparently associated with the hearth. Subsequent investigations revealed that the hearth had been redeposited and did not represent an in situ cultural deposit. A radiocarbon age of 1870 ± 80 B.P., 2-sigma cal range 32 B.C.-A.D. 375, was returned for a sample of charcoal from the hearth (O'Neil and Tate 1986).

Site 5AM42 (L:1:29). Several archaeological sites with and without associated radiocarbon ages are mentioned by Hunt (1954:114) in the context of dating Pleistocene and Holocene deposits in the Denver area. This information apparently was supplied by Arnold Withers of the University of Denver Department of Anthropology as a personal communication to Hunt, and is otherwise unpublished. This site and the following site are two of these sites. Site 5AM42 is located in Section 25, T. 2 S., R. 68 W, southeast of Thornton, just north of Welby, on an intermittent tributary to the South Platte River. A sample of charcoal was collected from a hearth located 45 cm (18 in) below the top of the Piney Creek alluvium. The hearth contained fragments of grinding stones in addition to the charcoal. No other artifacts are mentioned and the site is not given a cultural affiliation. The sample of charcoal returned a radiocarbon age of 1150 ± 150 B.P., 2-sigma cal range A.D. 611-1213. The site was designated Parker-Hunt by Butler (1981) and subsequent publications possibly because it was thought to be the site described as occurring at the type locality for the Piney Creek alluvium on Piney Creek north of Parker; the legal locations for both sites are similar and they are discussed in adjoining paragraphs.

Site 5AH48 (L:6:19). This site, located at the type locality of the Piney Creek alluvium in Section 25, T. 5 S., R. 66 W., was identified by Withers as a "Woodland" site and aside from the brief descriptions in Hunt (1954:114) and in Scott (1963), is unpublished. The cultural materials at the type locality site occur in a 1 m (3 ft) deep deposit of post-Piney Creek alluvium which is deposited on top of the Piney Creek alluvium. A few deeply cord-marked body sherds and two small, corner-notched projectile points were observed during a somewhat cursory examination of the collection at the University of Denver. The presence of pottery in buried archaeological sites is considered by Scott (1963) to be a diagnostic trait of the post-Piney Creek alluvium, and the Piney Creek alluvium contains only the remains of aceramic cultures.

Michaud A (5AH2) and Michaud B (5AH3) Sites. These sites are located on the west bank of West Bijou Creek in south-central Arapahoe County, approximately 16 km (10 mi) south of Byers and 1.6-2.4 km (1.0-1.5 mi) miles from the Elbert County line (J. J. Wood 1971). The burial from Michaud A is described in detail in the section, Early Ceramic Burials; the following description is limited to the cultural materials associated with the Early Ceramic period occupation levels at these sites.

Michaud A Site (5AH2) was considered to be a single-component site, with the burial associated with the occupation level (Level 1), which extended from the ground surface to a depth of 15-23 cm (6-9 in). One small (2.4 x 1.3 x 0.3 cm), corner-notched arrow point and two projectile point tips were recovered from the occupational level. Additional chipped stone artifacts include a corner-tang knife, six "blade" fragments, two end scrapers, two retouched flakes, two large quartzite cores with retouched edges, and 195 pieces of debitage. Five bifacially

ground metate fragments and one fragment of a bifacial mano were the only ground stone recovered from the site. Twenty-four sherds, including four rim sherds representing four different vessels, were unearthed. Three rims are vertical, and one is slightly outcurving, all with diagonal cord marks. Vessel shape was probably conoidal, and diagonal cord marks become more coarse and haphazard toward the bottom of the vessels, which were extremely thick in relation to the rest of the vessel. Some sherds from the bottoms of vessels exhibit deeper marks that may have been made by a sharp stick or some other tool. A radiocarbon age of 1800 ± 110 B.P., 2-sigma cal range 2 B.C.-A.D. 532 was returned from a sample taken from the lumbar vertebrae of the skeleton. The burial pit originates at the base of stratigraphic Level 1 and is thought to be associated with this occupation or possibly a later occupation. If one accepts the association of the burial with this component, and the radiocarbon age is accurate, the calibrated date range could possibly represent the earliest examples of both the presence of ceramics and the use of the bow in eastern Colorado However, more than one component could be present at this site although not represented in the artifact assemblage as a result of sampling error or as an actual lack of diagnostic artifacts from an earlier occupation. Unfortunately, no temporally diagnostic artifacts were associated directly with the burial (J. J. Wood 1971).

At the Michaud B Site (5AH3), three natural strata were identified in the excavation of two 1.5 x 1.5 m (5 x 5 ft) test units, the cultural materials were found in Level 1 (0-13 cm [0-5 in]) and Level 2 (13-43 cm [5-17 in]); Level 3 was culturally sterile. One hearth (Feature 1) and relatively few artifacts were recovered from Level 1. A fragment of a small, side-notched projectile point with a straight base, a single retouched flake, 42 pieces of debitage, and a fragment of a bifacially ground metate from Feature 1 were the only lithic artifacts recovered. Two cord-roughened sherds, one a rim sherd, were recovered from Level 1. The rim is incurving, and the cord marks are diagonal from right to left and extend to within 5 mm of the lip. The chipped stone assemblage of Level 2 contained one small, corner-notched projectile point with a triangular blade and a subconcave base, a projectile point tip, a stemmed concave-based blade, two leaf-shaped bifacial blades, two scrapers, two drills and 154 pieces of debitage. Two bifacial mano fragments (a cobble hammerstone and an edge ground cobble) were also found. Nine cord-roughened sherds, including two rim sherds, were found in Level 2. The rim sherds are vertical, and the cord marks are diagonal. Faunal remains include jack rabbit, prairie dog, long-tailed weasel, elk, and deer. Among the artifacts collected from the plowed area around the site are a fragment of a small, corner-notched or stemmed projectile point, a fragment of a large, corner-notched dart point or knife, and twelve sherds. One of the basal sherds exhibits stick or tool impressions similar to those described for a sherd at Michaud A. These marks are also described as reminiscent of basket impressions. The cultural material at Michaud B was thought to represent two components, based on the stratigraphic separation between materials of Level 1 and Level 2; the side-notched point and incurving rim sherd from Level 1 represent a later component. The component represented by the Level 2 materials does not differ appreciably from those at Michaud A (J. J. Wood 1971).

Site 5AH416. This site is located in southwest Arapahoe county, 5.2 km (3.25 mi) north of Parker (Kalasz et al 1996). The site is situated on a ridge overlooking the valley of Cherry Creek to the west. An intermittent tributary to Piney Creek dissects the site. Three classifiable projectile points and an additional five unclassifiable point fragments were recovered from excavations. Three of these points were small, expanding-stem points, one of which exhibited extended barbs and slightly serrated blade edges, and were suggestive of points assigned to the Late Prehistoric stage. The remaining five points were medium-sized, expanding-stem points that, based on size, were thought to represent Late Archaic types (dart points). The rest of the chipped stone

assemblage, including fragmentary items, was classified into subjective analytical tool categories that consisted of 25 early-stage bifaces, 23 middle-stage bifaces, seven late-stage bifaces, three side scrapers, one distolateral scraper, two undetermined scrapers, 705 expedient cutting/scraping flake tools, 27 expedient perforator flake tools, eight expedient multiple-task flake tools, 13 cores, 2 choppers, 20 indeterminate core/cobble tools, one formal drill, one spokeshave, 44 undetermined tools, and 2 pieces of miscellaneous chipped/battered stone. The dominant lithic material type was locally available Dawson Formation petrified wood, which ranged from 85 percent of the patterned tool assemblage to 97 percent of the retouched and utilized flakes. The ground stone collection consisted of five manos and 13 mano fragments, one basin metate and five metate fragments, and six undetermined fragments. Six cord-marked sherds (two rim) were assigned to one cord-marked ware. Manufacture was possibly lump modeling finished with paddle and anvil. Cord marks range from unobliterated to nearly completely obliterated. Cord marks on two sherds are crisscrossed, and polish is present on two sherds. Rims are direct, and two vessels are represented. Vessel form could not be determined from the small collection of sherds. Faunal remains were highly fragmented, and pronghorn was the only species positively identified. Charred macrobotanical remains, indicative of prehistoric utilization, included goosefoot seeds, a charred hedgehog cactus seed, and charred Ponderosa pine seeds. A charred seed of the pea family may indicate use of a member of this family. All of the cultural materials and features were found within a buried cumulic A horizon. Radiocarbon ages were 1960 ± 100 B.P., 2-sigma cal range 190 B.C.-A.D. 320 from Test Pit 1; 1920 ± 90 B.P., 2-sigma cal range 103 B.C.-A.D. 330 from Feature 2; 1860 ± 70 B.P., 2-sigma cal range A.D. 11-342 from Feature 5b; 1710 ± 70 B.P., 2-sigma cal range A.D. 145-535 from Feature 3; 1610 ± 80 B.P., 2-sigma cal range A.D. 252-630 from Feature 5a; 1590 ± 80 B.P., 2-sigma cal range A.D. 260-642 from test pit 3; 1460 ± 60 B.P., 2-sigma cal range A.D. 450-673 from Feature 1; 890 ± 50 B.P., 2-sigma cal range A.D. 1025-1276.

Mee Site (5AH258). This site is located in west central Arapahoe County, approximately 6 km (4 mi) northwest of the town of Parker (Joyner 1989). The site is situated on top of a knoll overlooking an unnamed tributary of Piney Creek. Artifacts recovered from the site during survey and testing are limited to a whole cord-marked vessel and one piece of debitage. The vessel was exposed at the surface upside down next to or on the edge of a hearth. The vessel is 22.5 cm high and 19.7 cm wide, with pronounced high shoulders and an incurving rim, and the overall form is conoidal and distinctly lopsided. The vessel was constructed by modeling the base, onto which thick, coils of clay were added by accretion. The surface of the vessel exhibits oblique, indistinct, partially obliterated cord marks. Other surface treatments include irregular brush or stick marks (Ellwood 1983). A sample of charcoal retrieved from the hearth and believed to probably be associated with the vessel returned a radiocarbon age of 1350 ± 50 B.P., 2-sigma cal range A.D. 606-777.

Sites 5DA450 and 5DA451. These sites are located in northwest Douglas County, on the east bank of Big Dry Creek just north of a bend in University Boulevard, south of Denver (Guthrie et al.1986). Site 5DA450 is described as an open camp 68 m north of 5DA451. Cultural materials observed on the surface were a scraper, flake tool, mano, grooved maul, two pieces of amazonite, and debitage. Cultural material from the subsurface included an end scraper, a utilized blade, two utilized flakes, three manos, and debitage. In a series of backhoe trenches and in the cutbank, seven stratigraphic units were identified. A radiocarbon sample from a hearth defined in the cutbank and originating 80 cm below the ground surface at the contact of Strata 2 and 3 returned an age of 870 ± 50 B.P., 2-sigma cal range A.D. 1031-1279. No artifacts were found in association with this feature. Site 5DA451 is described as an open camp; two scrapers, a uniface, a retouched

flake, two core tools, debitage, and two manos were the artifacts observed from both the surface and subsurface. Charcoal from a hearth located in the cutbank of Big Dry Creek, 108 cm below the ground surface near the bottom of Stratum 4, returned a radiocarbon age of 1330 ± 110 B.P., 2-sigma cal range A.D. 541-968. No artifacts were associated with this feature.

Franktown Cave (5DA272, L:9:31). This site is in a southeast-facing rockshelter located in eastern Douglas County on Willow Creek, 4 km (2.5 mi) southwest of Franktown. Controlled excavations at the site have occurred on five occasions since the first in 1942, all supervised by former students or current students and faculty of the University of Denver; none of the excavations have been published as a site report. However, as a result of this work, a great deal of information has accumulated within the files and collections at DU, that has been the basis for unpublished specialized research reports, including several masters' theses (Pustmueller 1977; Sayres 1984) and a number of undergraduate honors papers and independent study papers (Holmes 1957; Manz 1973; Stapp 1977; Studenmund 1976; Radspinner 1977), and notes on the analysis of fragments of coiled basketry (Adovasio 1972), all of which are on file at DU.

Withers (1954) used the excavated materials from Franktown Cave among other sites to define the Franktown focus, a cultural manifestation centered in the Palmer Divide area, that he thought represented a transitional development between the Woodland culture and the Upper Republican culture. Because of the many problems with the recorded information from the excavations and the lack of any useful qualitative or quantitative description of the material culture other than the projectile points, separation of the different components is impossible. Most of the cultural material does seem to be associated with the ceramic components at the site. The majority of the classifiable projectile points (n=50) recovered were small triangular points with side notches and concave bases (n=26), which were found in association with both cord-marked and obliterated cord-marked ceramics. Three small, corner-notched points were also recovered from the site, as well as corner- and side-notched dart points. Small, unnotched projectile points were also recovered from the upper levels. Knives, drills, gravers, perforators, awls, scrapers, choppers, flakes, and cores were also recovered. The ground stone assemblage consisted of 61 complete and 28 fragments of manos, eight complete and 36 fragments of metates, one shaft abrader, and 100 unclassified pieces. The ceramic assemblage consists of 862 sherds, 34 of which are rim sherds (Studenmund 1976). Approximately 100 sherds from the collection were incorporated into a vessel that was reconstructed. This conoidal vessel features an incurving rim and an exterior surface that is cord-marked. Based on a 10 percent random sample of the collection of body sherds (n=74), one-third of the body sherds are plain (n=24), and two-thirds are cord-marked (n=50). Based on the entire collection of rim sherds (n=36), only six of the rim sherds are plain, and on all of the cord-marked rim sherds the cord marks have been smoothed. One rim sherd from the collection is from a vessel with a collared rim, similar to Upper Republican ceramics. Forty-six percent of the cord-marked rims are incurving, 25 percent are outcurving and 29 percent are vertical. Twenty-five percent of the rim sherds are thicker at the rim than below the rim, and 14 percent exhibit incising on the lip. Median estimated size of all vessel openings based on projections from rim sherds is 20.5 cm. Of the sample of cord-marked body sherds, 28 percent have a slip on the interior surface and 46 percent have a slip on the exterior surface. Of the plain body sherds, 29 percent are slipped on the interior surface and 50 percent are slipped on the exterior.

The most remarkable aspect of the Franktown Cave artifact assemblage is the presence of an unprecedented number of perishable items and ecofacts (Radspinner 1977). Bone tools, pieces

of fur, fur coils, a moccasin, leather thongs, pieces of hide, worked wood, fragments of coiled basketry, plaited sandals, cordage, and a fragment of a net have been recovered. Other perishables include shell, coprolites, and corn kernels, corncobs, and corn stalks, the latter of which would seem to be the strongest evidence to date that corn was grown along the foot of the Front Range during the Early or Middle Ceramic period. Two radiocarbon ages are associated with the excavations; however, the provenience for these samples is inexact. An age of 890 ± 65 B.P., 2-sigma cal range A.D. 1016-1281, was returned from a sample of charcoal from the upper part the deposits, but no exact provenience or cultural association was determined, although it was assumed to be associated with the Early Ceramic component and does fall into the transitional Early Ceramic period as defined in this document. A second radiocarbon age of 1755 ± 65 B.P., 2-sigma cal range A.D. 126-426, is from a hearth 85 cm below the ground surface, associated with an aceramic component that contained corner-notched dart points.

Bayou Gulch Site (5DA265). This site is a multicomponent open campsite located in eastern Douglas County, 5 km (3 mi) north of Franktown. The site is situated on the west- and north-facing slopes of a low ridge above the confluence of Bayou Gulch and Cherry Creek. Close to 500 m^2 of the site was excavated by the Colorado Department of Transportation in 1979. To date, no synthetic report has been written, but some of the information from the site has been used for different projects. These include an article documenting the ceramic analysis (Ellwood 1986), a thesis concentrating on paleoenvironmental reconstruction based on site stratigraphy coupled with basic artifact analysis (Gilmore 1991b), and manuscript reports on pollen (Short and Stravers 1981), faunal analysis (Kihm 1979), and macrobotanical remains from flotation (Nickerson 1980).

In his dissertation, Butler (1986) used the Bayou Gulch artifact assemblage for the generation of an artifact typology for northeast Colorado. The cultural materials are embedded in a sequence of eolian deposits that represent episodes of aridity and intervals between the eolian strata that represent periods of increased effective moisture and surface stability. Radiocarbon ages from prehistoric features give bracket ages for both the deposition of the site strata and for the various components within these deposits. The strata associated with the Early Ceramic component are the upper part of Stratum 2a, which had been deposited by 1660 ± 55 B.P., 2-sigma cal range A.D. 252-542, for Feature 5; the contact of Strata 2a and 2b, an interval of surface stability that lasted from 1660 B.P. to 1004 ± 41 B.P., 2-sigma cal range A.D.. 971-1159, which is an average of the ages from Features 1 (1050 ± 55 B.P., 2-sigma cal range A.D. 888-1153) and 3 (950 ± 60 B.P., 2-sigma cal range A.D. 989-1226. Stratum 2b, which was deposited between 1004 ± 41 B.P. and 510 ± 85 B.P., 2-sigma cal range A.D. 1297-1627 for Feature 33, contains most of the cultural material associated with the Early and Middle Ceramic components. Butler (1986) divided the Woodland cultural materials into six separate components (BG-1 through BG-6), based on a combined system of cross dating of temporally diagnostic artifacts and radiocarbon ages from the site. Gilmore (1991b) determined that because of methodological problems, there was difficulty in determining the stratigraphic provenience of many artifacts, and so the majority of the cultural materials could not be assigned a stratigraphic provenience more exact than the very coarse cultural units of Early and Middle Ceramic, and Protohistoric periods, represented by Strata 2b and 3, and Archaic components, represented by Stratum 2a. Obviously, based on the terminal age for Stratum 2a deposition (1660 B.P.), and the long period of hypothesized of surface stability (660 years) before Stratum 2b deposition, not to mention the usual vagaries of site formation, there was inevitably a certain amount of overlap between the two divisions.

The following discussion of the cultural material is drawn form Gilmore (1991b). Of 187 classifiable projectile points from Bayou Gulch, 56 were small, corner-notched points (Gilmore Type 8), similar to points found in Early Ceramic contexts. Type 8 points were divided into two subjective subtypes. Subtype 8a points, which seem to correspond to Butler's (1986) Type 2 Magic Mountain Corner-notched, which are small to medium-sized, thicker points with relatively thinner neck widths, deeper notches resulting in barbs and a longer expanding stem, and serrated blade edges in some examples. Subtype, 8b points, which seem to correspond to Butler's (1986) Type 1 Bayou Gulch Corner-notched, are smaller, thinner points with shallow notches resulting in wider neck widths and shorter stems. The rest of the chipped stone assemblage was assigned to subjective categories, and differences in the distribution between the different strata were tested for significance, but no metric analysis was attempted. Of the 520 unhafted bifaces, 401 could be assigned a stratigraphic provenience. These bifaces were assigned to three different reduction stages, and the distribution within these stages between the three strata were not significant. Other classes of chipped stone artifacts were drills (n=16), unifaces (n=118), miscellaneous worked stone (n=84), retouched Flakes (n=82), and debitage (n=35,907). This amount of debitage represents the flakes from 37 excavation units where the flakes were actually counted, and based on this number, it was estimated that more than 100,000 pieces of debitage were recovered from the entire site. The majority of the chipped stone tool assemblage (n=1004, 78.5 percent) was manufactured from the locally available Dawson formation petrified wood, and 89 percent (n=25,614) of the recorded debitage was also of petrified wood. Quartzite made up 8 percent of the tool and debitage assemblage, with chert, chalcedony, locally available rhyolite, and exotic materials making up the remainder. A total of 432 pieces of ground stone was recovered, and of these, 376 could be assigned a stratigraphic provenience. These 376 pieces including 199 manos and mano fragments, 121 metates and metate fragments, and 56 miscellaneous pieces including one grooved stone, one "paint palette" and 54 unidentified fragments. The ground stone typology used at Magic Mountain (Irwin-Williams and Irwin 1966) was applied to the collection of manos and mano fragments from Bayou Gulch to test the hypothesis that certain types of manos were culturally and temporally diagnostic. At the Magic Mountain site, there is an apparent technological shift in mano morphology between the Archaic and Late Prehistoric stages. A statistically significant difference occurs between the mano assemblages at Bayou Gulch; within the Archaic levels is a greater diversity in mano types, based on morphological and functional criteria, and many examples are deliberately shaped. Variation in mano morphology decreases at both Bayou Gulch and Magic Mountain sites; mano forms become much more standardized during the Late Prehistoric stage. The majority of manos from the Late Prehistoric levels are not deliberately shaped, and so uniformity of mano morphology must fully be a factor of function. This change may represent a decrease in specialized processing tasks requiring specialized tools, or a greater reliance on fewer resources requiring processing and consequently resulting in a greater uniformity in the assemblage. This may also be an indicator of a greater reliance on domesticates such as corn.

The majority of the ceramics were placed into two types; Type I ceramics were thought to be related to ceramics of the Valley phase of southeastern Nebraska and northeastern Kansas, and Type III ceramics were thought to resemble Harlan Cord-roughened of the Keith phase of north-central Kansas and south-central Nebraska (Ellwood 1987:135). A small number of plain ware sherds (n=11, six rim sherds) were also recovered, but there was too much internal variation within this group to assign them a cultural affiliation. There was no stratigraphic separation between Type I and Type III sherds, and Ellwood (1987) hypothesized that they may actually represent

different functional types that were used contemporaneously, instead of representing use of the site by different cultural groups.

Nine species were identified in the faunal collection; bison dominated, with pronghorn, deer, canid, bear, prairie dog, deer mouse sized rodent, and rabbit also represented. More than half of the bone recovered was unidentifiable fragments (Kihm 1979). The fragmentary nature of most of the bone indicated extensive processing of the material at the site. Bone artifacts include three awl fragments, one complete bone bead made from a canid metapodial, six polished fragments of bone, and a bison scapula that shows evidence of having been used as a digging tool. Parallel lineations and a groove perpendicular to the long axis of the bone suggest hafting to a handle, and fine striations on the worn blade of the scapula suggest wear consistent with digging (Kihm 1979:10). This tool was recovered from Feature 19, with an associated averaged age of 895 ± 36 B.P., 2-sigma cal range A.D. 1032-1245. Two subtype 8b projectile points and both Types I and III ceramics were also recovered from this feature. The most important result of the analysis of pollen samples recovered from both ground stone artifacts and soil was the presence of *Zea mays* pollen in intact prehistoric contexts. More detailed information related to horticulture at Bayou Gulch is found in Evidence of Early Ceramic Horticulture, below. Macrobotanical remains were recovered from features and soil samples; samples from features were dominated by *Chenopodium* (goosefoot) seeds, and other remains from features included *Selene antirrhina* (sleepy catchfly), *Rhus trilobata* (skunkbush), *Bromus* sp. (bromegrass), *Portulaca oleracea* (purslane), *Helianthus* sp. (sunflower), *Cryptantha* sp., *Polygonum* sp. (knotweed), and Cruciferae family (mustard). Calyxes of *S. antirrhina* were the only charred remains recovered. Two features were interpreted as possible habitation structures. Feature 33 is a large basin with associated postholes and a possible central hearth, and Feature 37 is also a large basin with a central concentration of fire-cracked rock that was discovered on the last day of the excavation season and only partially excavated. More detailed information is included under Early Ceramic Habitation Structures, below. Radiocarbon ages from the Early Ceramic component in addition to the ages already given above include 1520 ± 50 B.P., 2-sigma cal range A.D. 426-648 from Feature 10; 1440 ± 55 B.P., 2-sigma cal range A.D. 540-678 from Feature 18a; 1350 ± 65 B.P., 2-sigma cal range A.D. 603-790 from Feature 18; and 870 ± 55 B.P., 2-sigma cal range A.D. 1028-1281 from Feature 12.

Cliff Swallow Cave (5EL2). Cliff Swallow cave is located in southwest Elbert County, "42 airline miles southeast of Denver" and approximately 6 km (4 mi) northwest of Elbert (Morton 1954). Although this undated, sheltered campsite was included with the Middle Ceramic period in the previous prehistoric context (Eighmy 1984), it seems more appropriate to included it with the Early Ceramic period sites as an example of a transitional site. The cave is a west-facing recess in what is mapped as Castle Rock Conglomerate (Tweto 1979), 180 m (600 ft) east of Running Creek. Only the upper 43 cm (17 inches) of the shelter sediments were excavated because below that level the matrix was too wet to screen. Three cultural levels separated by charcoal lenses were excavated. In Level 1, described as 25 cm (10 inches) thick, three stemmed and corner-notched projectile points were found in association with 80+ cord-marked sherds; the single rim sherd was vertical and impressed with vertical cord marks. Other artifacts included what seems to be a large, corner-notched knife, 13 end scrapers, a modified flake, more than 100 unmodified flakes, fragments of a basin metate and seven fragments of unifacial manos. Level 2, 20 cm (8 inches) thick, contained 42 classifiable projectile points, 20 triangular points with concave to straight bases and side notches, three points with side and basal notches, and 16 unnotched points. Other chipped stone included three equilaterally triangular bifaces, two T-shaped drills, two reamers, 44 end scrapers, three side scrapers, two spokeshaves, four "stone awls," four gravers or punches, two

knives, five "ripping flakes," and two triangular bifaces with high side notches, resulting in a stem length 67 percent of the total length of the artifact. Fragments of one reconstructible bifacial metate and parts of two others, two whole manos and fragments of more than a dozen others, and three grooved shaft abraders were also recovered. Two rectangular pieces of worked bone and three pieces of unmodified shell were also found.

More than 200 sherds were recovered from Level 2; 95 percent are cord-marked, 4 percent are unmarked, and two sherds exhibit portions of an incised design. Rim sherds from two vessels were recovered; both vessels had vertical or outcurving rims with vertical cord marks. Faunal remains included bison, pronghorn, mule deer, large coyote, mountain lion, and cottontail rabbit. Ninety-five percent of the bones had been split for marrow extraction. The cultural material recovered from Level 3 is similar to that of Level 2, with 21 side-notched points, two with side and basal notches, 17 unnotched points, six equilaterally triangular bifaces, and other tools representing most of the categories and in roughly the same numbers described for Level 2. An area 3 x 4 m (10 x 14 ft) adjacent to the rockshelter was excavated as one level. This area was covered with boulders that had fallen from the rockshelter roof. The artifact assemblage for this area was similar to Levels 2 and 3 inside the shelter, with side-notched, side- and basal-notched and unnotched projectile points, and other chipped stone and ground stone tools. The ceramic assemblage was more substantial than that recovered from the rockshelter. More than 700 sherds, including rim sections from nine different vessels, including a major portion of a reconstructed vessel, were recovered from the area adjacent to the rockshelter. All rims exhibited vertical cord marks. Six of the vessels had incurving rims; two of these had tooled and beveled lips, three had a plain beveled lip, and one had diagonal cord marks on a beveled lip. Two vessels had vertical or outcurving rims, one had a tooled and beveled lip, and one had diagonal cord marks on a cambered lip. The final vessel had a collared rim with pinched nodes and incised diagonal notches in a flat lip, and was thought to be "intrusive." Ninety-eight percent of all sherds from this area were cord-marked on the exterior surface, but many of the sherds exhibited smoothing of these marks. The reconstructed vessel was "egg shaped" with a conical bottom; it was 35.5 cm high, 34.5 cm in diameter, and had a mouth diameter of 17.5 cm. The date of site occupation was estimated (based on cross dating of temporally diagnostic artifacts) to have occurred between A.D. 1000 and 1300. One interesting aspect of the stratigraphy is the seeming inversion between the Early Ceramic projectile points of Level 1 and the later, side-notched forms.

Hogbacks/Foothills

Spring Gulch Site (5LR252). This site is an open camp located in eastern Larimer County, 37 km (23 mi) northwest of Fort Collins and 5 km (3 mi) north of Livermore (Kainer 1976). Cultural materials were recovered from five natural levels within deposits of colluvium and alluvium. Three separate localities were excavated; the majority of the cultural materials were recovered from Locality I, which was also thought to contain the most intact deposits. The Early and Middle Ceramic materials were recovered from Level I, Level II, and the upper portion of Level III. Radiocarbon ages from near the upper stratigraphic boundary of Level II were 935 ± 140 B.P., 2-sigma cal range A.D. 813-1304, and 1075 ± 135 B.P., 2-sigma cal range A.D. 669-1251. One additional radiocarbon age, 880 ± 180 B.P., 2-sigma cal range A.D. 782-1421, was associated with Level II. Two radiocarbon ages are associated with the upper stratigraphic boundary of Level III, 1315 ± 135 B.P., 2-sigma cal range A.D. 448-1009, and 1485 ± 70 B.P., 2-sigma cal range A.D. 424-670. The lower stratigraphic boundary of Level III has an associated radiocarbon age of 2340 ± 85 B.P., 2-sigma cal range 764 B.C.-192 B.C., well before the beginning of the Early Ceramic

period. The Early and Middle Ceramic components were mixed, which makes interpretation difficult. Thirty-five types of projectile points were identified. The majority of small, side-notched points identified as Middle Ceramic types (Types 1-5), were recovered from Level I and the upper half of Level II. The majority of small, corner-notched points identified as Early Ceramic period (Types 6-8), were recovered from Level I, Level II and the upper half of Level III. Other categories of chipped stone tools recovered from the site were seven types of bifaces, two types of choppers, eight types of end scrapers, nine types of side and discoidal scrapers, two types of spokeshaves, three types of drills, two types of gravers, a single burin, utilized flakes, cores, and 18,845 pieces of debitage. Lithic materials represented in the debitage assemblage were quartzite (75 percent), cryptocrystalline (25 percent). Obsidian flakes (n=4), and clear quartz flakes (n=30) represented less than two-tenths percent of the debitage. The ground stone assemblage contained five types of grinding slabs, three types of handstones and three types of hammerstones. Ceramics were divided into three types. Type 1 ceramics exhibited partially obliterated, cross-hatched cord marks resulting in a corrugated appearance, with incurving rims. Type 2 ceramics, exhibited unpatterned cord marks and flattened, smoothed rims. Three unfired, deeply cord-marked body sherds, designated Type 3, were recovered from Level II. The majority of sherds that could be assigned a stratigraphic provenience were recovered from the bottom of Level I and the top of Level II. Three types of hearths were also identified.

Owl Canyon Rockshelter (5LR104). This multicomponent sheltered campsite is located 29 km (18 mi) northwest of Fort Collins, 8 km (5 mi) east of Livermore, and 8 km (5 mi) southeast of the Spring Gulch site (Burgess 1981). The site is situated in a small, south facing shelter (2 m deep and 6 m long) at the base of the east side of the Dakota hogback. Five strata were observed in the sediments within and in front of the rockshelter, and most of the cultural material and features were found within Stratum 3, which contained two compact living surfaces. Eleven small, corner-notched Early Ceramic projectile points were recovered from Stratum 3, nine of these exhibited serrated blade edges and were classified as "Hogback" points. A total of 74 sherds was also recovered, 89 percent of which exhibited cross-hatched or parallel cord marks. Rim sherds from three vessels indicated that the rims of two were possibly flaring and the third was direct. Cord marks were vertical to slightly oblique to the rim. On 11 percent of the sherds, the cord marks were obliterated or smoothed. Nine pieces of ground stone, six bone awls, and one drill tip were also recovered. Five small, side-notched projectile points were found in Stratum 3, suggesting mixed Early and Middle Ceramic components. Radiocarbon ages associated with Stratum 3 were 1280 ± 80 B.P., 2-sigma cal range A.D. 634-962 for Feature 1; 1005 ± 60 B.P., 2-sigma cal range A.D. 896-1170 for Feature 11; and 930 ± 60 B.P., 2-sigma cal range A.D. 1003-1250 for Feature 18.

Lightning Hill Site (5LR284). This multicomponent open campsite is situated near a large spring 3 km (2 mi) northeast of Livermore (Morris and Marcotte 1977b; Morris and Mayo 1979; Morris et al. 1984). The Early Ceramic component was characterized by small, deeply corner-notched and sometimes serrated projectile points, cord-marked sherds, and numerous hearths containing fire-cracked rock. Two human burials, one primary interment with accompaniments, and one secondary burial with no accompaniments may be associated with the Early Ceramic component. These burials are discussed in greater detail in the Burial Section below. Radiocarbon ages associated with the Early Ceramic component are 1580 ± 110 B.P., 2-sigma cal range A.D. 239-666 for Feature 20; 1635 ± 160 B.P., 2-sigma cal range A.D. 69-683 for Feature 3; 1770 ± 115 B.P., 2-sigma cal range A.D. 12-545.

Kinney Springs Site (5LR144). This multicomponent open campsite is located near Livermore (Morris and Litzinger 1985a; 1985b). The Early Ceramic component was characterized by small, corner-notched projectile points with convex bases, some with serrated blade edges, and "crude" cord-marked, grit-tempered ceramics. Other artifacts included a range of chipped stone scrapers, bifaces and choppers; ground stone slabs and handstones; a few bone tools; and a shell bead. This component was assigned a Hogback phase affiliation. An interesting feature was interpreted as a habitation structure associated with the Early Ceramic component is a smooth oval floor that is partly surrounded by a rough stone wall. Better-preserved portions of this wall are 35-50 cm wide and 25 cm high. The structure is 2.5 m wide and 3.7 m long. A gap in the wall on the southeast side is thought to represent a doorway. Floor matrix from this structure was sampled in 25 cm quadrats, 5 cm thick. Flotation analysis of the samples resulted in the recovery of charcoal, bone fragments, seeds, macroartifacts, and microdebitage. Interpretation of the nonrandom distribution of these materials allowed for the formulation of intramural activity hypotheses. Unfortunately, these interpretations are not yet available. A radiocarbon age of 950 ± 60 B.P., 2-sigma cal range A.D. 989-1226, was returned from the floor of the structure; a radiocarbon age of 1120 ± 60 B.P., 2-sigma cal range A.D. 782-1023, was returned from a hearth 15 cm below the floor of the structure. Other radiocarbon ages from the Early Ceramic period component are 1510 ± 70 B.P., 2-sigma cal range A.D. 414-663 and 1650 ± 70 B.P., 2-sigma cal range A.D. 243-592.

Site 5LR1098. This large, multicomponent open campsite is situated on a broad north-facing terrace above the flood plain of the North Fork of the Cache la Poudre River, approximately 3 km (2 m) upstream from its confluence with the Cache la Poudre River, 16 km (10 mi) northwest of Fort Collins (Grant et al. 1988). At present, the site is inundated seasonally by Seaman Reservoir. The site consists of a minimum of 90 prehistoric hearths, three stone circles, and a surface scatter of lithic, ground stone and ceramic artifacts representing Paleoindian through Late Prehistoric occupations. Low-energy erosion has resulted in the deflation of the cultural materials. Diagnostic Late Prehistoric projectile points collected from the surface include Early Ceramic corner-notched and Middle Ceramic side-notched styles, including an expanding, side-notched point similar to points that have been found elsewhere in association with ceramics of the Intermountain Tradition. Cord-marked and obliterated cord-marked ceramics have been collected from the site. Two features (Features 12 and 15) returned radiocarbon ages of 570 ± 70 B.P., 2-sigma cal range A.D. 1290-1449, and 1080 ± 80 B.P., 2-sigma cal range A.D. 782-1159, respectively.

Site 5LR1102. This multicomponent sheltered campsite is situated within a small, west-facing rockshelter (14 m long, 3 m deep) overlooking the Cache la Poudre River, approximately 3 km (2 mi) upstream from its confluence with the North Fork (Grant et al. 1988). Debitage, ground stone, bone, and chipped stone tools including a two fragmentary projectile points (one a small, triangular corner-notched projectile point and the other a stemmed point that may be a reworked Middle Archaic point), a biface fragment, a core, and two fragments of ground stone were recovered from the upper of two subsurface prehistoric components contained within colluvial deposits in the shelter. Diffuse granules of charcoal from the upper component returned an age of 1650 ± 50 B.P., 2-sigma cal range A.D. 259-542. The lower component contained no diagnostic cultural material, and no radiocarbon ages were associated with it.

Site 5LR1112. This multicomponent sheltered campsite is situated within a small, northeast-facing rockshelter (6 m long, 3 m deep, and 1.25 m high) situated at the base of vertical rock face on the flood plain of the North Fork of the Cache la Poudre River, approximately three miles

above its confluence with the Cache la Poudre River (Grant et al. 1988). Cultural material recovered from a 1 x 2 m test unit included three biface fragments, one uniface, one utilized flake, eight pieces of debitage and one fragment of ground stone. These cultural materials were associated with the uppermost of two subsurface components. Two features were also associated with the upper component. Feature 1 was an ash-filled basin hearth, and Feature 2, which consisted of both upright and horizontal slabs and partially burned pieces of wood thought to represent collapsed posts is interpreted as a stone and timber structure. Further interpretation of Feature 2 was hampered by the relatively small portion of the feature uncovered in the test unit. A sample of wood from Feature 2 returned a radiocarbon age of 1200 ± 50 B.P., 2-sigma cal range A.D. 688-974. The lower component contained no diagnostic cultural material, and no radiocarbon ages were associated with it.

Lykins Valley Site (5LR263). This site is best known as one of the few dated Protohistoric-Historic Native American sites in Colorado. Apparently, it also has an undefined Early Ceramic component. Samples of charcoal from two hearths (A and B) located in the cutbank of Boxelder Creek in the vicinity of the site were submitted for radiocarbon dating. Hearth A, a small charcoal and ash lens 1.98 m below ground surface returned an age of 1370 ± 175 B.P., 2-sigma cal range A.D. 340-1017. Hearth B, a rock-lined hearth at a depth of 1.10 m below ground surface, returned an age of 1675 ± 85 B.P., 2-sigma cal range A.D. 148-594. No artifacts were recovered in association with either of these features (Ohr et al. 1979).

Valley View Site (5LR1085). This open camp/architectural site is situated on an east facing bench on a hogback ridge west of Loveland in southeast Larimer County (Brunswig 1990a; 1999). Two of the four stone circles recorded at the site (designated Structures 1-4) and two superimposed hearths were excavated by the University of Northern Colorado over the course of three field seasons. Two Woodland subcomponents (2A and 2B) were identified within stratified deposits at the site, as well as an underlying Late Archaic component. The upper subcomponent (2B) contained 12 small, corner-notched projectile points (at least two with serrated blade edges), as well as a variety of scrapers, gravers, a spokeshave, and modified flake tools. Twenty sherds with deep cord marks were also recovered from Subcomponent 2B.

The two excavated structures were associated with Subcomponent 2B. Structure 1 was a stone oval 2 m in diameter that contained a well-packed floor and a concentration of burned rock in a shallow pit. A radiocarbon age of 1840 ± 50 B.P., 2-sigma cal range A.D. 65-339 was obtained from a sample of charcoal from Subcomponent 2A, immediately below the foundation stones of Structure 1. Structure 2 was a shallow, rock walled pit structure 3.5 m in diameter that contained 40 cm of cultural deposits. Internal features included a central hearth and a concentration of ground stone. A 4 m long stone "wingwall," which was interpreted as representing the foundation of a lean-to, extended to the southeast from Structure 2. A radiocarbon age of 1080 ± 60 B.P., 2-sigma cal range A.D. 782-1149 was returned for Subcomponent 2A from underneath the foundation rocks of Structure 2, and a radiocarbon age of 1160 ± 60 B.P., 2-sigma cal range A.D. 692-1017 was returned from the central hearth of Structure 2 (Robert Brunswig, personal communication 1999). Additional information concerning these features can be found in the Early Ceramic Habitation Structures section below.

Feature 1, a rock filled hearth exposed at the surface, was superimposed over a 2 m long trench containing fire-cracked rock, charcoal, broken chipped stone tools, and debitage (Feature 2). These features were located approximately 1 m east of the wing wall of Structure 2. Feature 2 was

interpreted as a roasting pit, and charcoal from this feature returned a radiocarbon age of 1330 ± 50 B.P., 2-sigma cal range A.D. 611-801. Floral remains recovered from the site include seeds of chokecherry, wild plum, and prickly pear cactus. Cheno-Am and Graminae (grass) pollen was recovered from the interior of Structure 2. The faunal assemblage was dominated by deer, with bison and elk also represented. Most of the recovered bone was fragmentary, which suggests extensive processing for marrow and bone grease extraction. The presence of fragmentary bones from small mammals suggested that rabbit- and squirrel-sized animals were also utilized.

Indian Mountain Site (5BL876). This open architectural site is situated on the eastern side of the Dakota hogback east of Lyons, in northeastern Boulder County (Cassells and Farrington 1986). The site consists of the remnants of 10 stone circles in three discrete groups (Areas 1, 2, and 3), representing the remains of at least two Early Ceramic occupations. Excavation units were placed in all three areas, and six of the 10 rings were at least partially excavated. Cultural material was recovered from 2.5 to 5 cm below the modern ground surface. Artifacts recovered included the tip of a projectile point with serrated blade edges, one fragmentary biface, a scraper/spokeshave, one small brown ware sherd, and 60 unmodified flakes. The fragment of the projectile point was not considered diagnostic, although was thought to be consistent in size and shape with projectile points associated with Woodland components in the hogbacks/foothills and plains. With the exception of the biface fragment and one flake, all of the artifacts were recovered from excavations in Area 3, in the vicinity of Rings 4 and 5. AMS radiocarbon ages were returned for small samples from defuse scatters of charcoal associated with internal hearths in three of the rings. Ages of 1120 ± 200 B.P., 2-sigma cal range A.D. 552-1288, from Ring 3 in Area 1, and 1280 ± 195 B.P., 2-sigma cal range A.D. 404-1168, from Ring 1 also in Area 1 define the later Early Ceramic period component. A radiocarbon age of 2140 ± 200 B.P., 2-sigma cal range 772 B.C.-A.D. 329 was returned from a scatter of charcoal within Ring 4. Use of a relative dating technique of measuring the depth of depression of the carbonate level under individual rocks that make up the rings, confirms the relative ages of the rings with associated radiocarbon ages; the carbonate horizon beneath stones in the ring with the early age was depressed to a significantly greater depth than the carbonate horizon beneath stones in the rings with later ages. This independent test was considered significant and was thought to validate the radiocarbon ages. With this in mind, the radiocarbon age of 2140 B.P., which in most contexts would be considered Late Archaic, was interpreted as representing the age of the component containing the brown ware sherd and the so called Woodland style projectile point tip, even though this predates by 300 years what is considered the earliest radiocarbon ages associated with definitive Early Ceramic components in Colorado. The nearest ceramic site with a date this early cited by Cassells and Farrington (1986) for comparative purposes was a Valley phase Woodland site on the Missouri River in Kansas. Caution should be used when making these sorts of interpretations based on data from possibly equivocal contexts.

Magic Mountain Site (5JF223). This multicomponent open camp is located 2.4 km (1.5 mi) south of Golden and 8 km (5 mi) north of Morrison in north-central Jefferson County. It was the first multicomponent site with occupations dating from the Early Archaic through the Early Ceramic periods to be extensively excavated and reported. Since publication of the monograph documenting the excavation of the site by Harvard University (Irwin-Williams and Irwin 1966), this site has served as the cultural yardstick against which the majority of sites found on the Colorado Piedmont have been measured. The site is situated on a low ridge overlooking Apex Creek, between the Dakota hogback to the east and the hogbacks/foothills to the west. Collectors

had known of the site for years, and the site had been extensively vandalized prior to the 1959-1960 excavations.

The cultural material was contained within a series of alluvial units deposited on Lyons Formation bedrock. Cultural materials from the Early Ceramic occupations are associated with the upper two alluvial strata. Geologic Unit 1 is correlated with the post-Piney Creek alluvium and contains the cultural material of archaeological Zone A, the Woodland component. Geologic Unit 2 is correlated with the Piney Creek alluvium and contains the cultural material of archaeological Zone B, which was thought after the Harvard excavations to represent a very late preceramic occupation affiliated with the Southwest. However, further excavations in 1994 and 1996 supervised by personnel from Centennial Archaeology, Inc. revealed that the component contained in Unit 2 was in fact also a Woodland component (Kalasz and Shields 1997).

According to Irwin-Williams and Irwin (1966), several artifact types were exclusive to the Woodland component. Types MM 31-38 projectile points (n=102) are associated exclusively with Zones A and B, and 79 percent of these (n=81) are small, corner-notched points with expanding stems; most of these (n=78, 77 percent) exhibit deep corner notches and oblique to extended oblique shoulders. Types MM 26 and MM 27 are large, corner- or basal-notched dart points (n=6) that were recovered from Zone B, and large side-notched dart points or knives (Type MM 28, n=3) were recovered from Zone A. The three side-notched points (types MM 19 and MM 20) from Zone B may be associated with Zone C. Other chipped stone tools thought to be diagnostic of the Woodland component are end scrapers with symmetrical round ends (Type MM 41), and those with broad straight ends (Type MM 42), and several types of flanged and expanding base drills (MM 85, 88, 89, and 90). The ground stone assemblage from the Zone A and B components was much less diverse than that of the lower cultural levels. Although not restricted to Zone A or B, Type II manos (MM 102), with convex grinding surfaces on otherwise unmodified circular to oval alluvial cobbles were thought to be characteristic of the Woodland culture. The majority of grinding slabs (95 percent) documented for Zones A and B are classified as Grinding Slab III (Type MM 111), which are shaped, oval slabs of sandstone with a shallow, oval basin grinding surface and striations parallel to the long axis of the slab. Five small, polished basalt pebble "charm stones" were also recovered from Zone A, and were thought diagnostic of the Woodland Culture at Magic Mountain (Irwin-Williams and Irwin 1966).

Seventy-eight sherds were recovered during the Harvard excavations, all from Zone A, and these were classified into four types. Plain ware ceramic sherds belonging to Type II, MM 124 (n=11), were thought to be from vessels that were coiled and scraped while wet on the interior and exterior surfaces. A single rim sherd suggested a vessel shape similar to that of the plain ware bowl found at the LoDaisKa site (Irwin and Irwin 1959). Both the LoDaisKa plain ware and the plain ceramics from Magic Mountain were thought to be affiliated with the Fremont culture of the Colorado Plateau. Types MM 125, 126 and 127 are all forms of cord-marked Woodland ceramics manufactured using paddle and anvil.

Preliminary analysis of the faunal remains suggested that deer, bison, and small game such as rabbit and prairie dog were important resources. Worked bone from Zones A and B included bone awls and beads manufactured from both bird and mammal bones.

The overall conclusions concerning the Woodland culture at Magic Mountain were that the site was at the extreme western margin of the Woodland culture area, and was subsequently a

"dilute and extremely simple" version of it. Relationships were with the Plains Woodland cultures of Kansas and Nebraska, but by the ninth century A.D., these people were in contact with the ceramic cultures of southwestern Colorado (Pueblo) and western Colorado (Fremont), and were trading ideas and/or materials. This hypothesis was partly based on the presence of Fremont-like, corner-notched projectile points with serrated blade edges and plain ware ceramics manufactured by coiling.

Excavations in 1994 and 1996 by Centennial Archaeology, Inc. are reported in an excellent volume that is full of useful qualitative and quantitative information (Kalasz and Shields 1997). Due to the limits of time and the volume of cultural materials recovered, investigations were limited to excavation of deposits making up cultural Zones A and B, overlying Archaeological Zone C/Geological Unit 3. In the Centennial excavations, the sediments that were divided by Harvard investigators into Zone A and Zone B were characterized as a relatively homogeneous overbank deposit that contained a culturally consistent series of occupations that occurred between A.D. 100 and 1000. Of the total number of classifiable projectile points (n=119), the majority (52 percent, n=62) were assigned to the Late Prehistoric stage. These points are similar to those recovered by the Harvard investigators: small, corner-notched types, many with deep notches and oblique to extended oblique shoulders, with a significant percentage of these points exhibiting serrated blade edges. Twenty-nine percent of the classifiable points were large corner-notched types that are similar to Late Archaic types, and some of these points are probably associated with initial Early Ceramic occupations. Many aspects of the chipped stone assemblage are similar to those of the collection recovered from the Harvard excavations, and the metric data presented for this assemblage complements the mostly nonmetric data presented in Irwin-Williams and Irwin (1966). The chipped stone assemblage was divided into four Groups. Group 1 consists of stemmed bifaces (13 types of projectile points and one type of stemmed knife), formal drills (one type), and unstemmed bifaces (three reduction stages in both unstemmed bifaces and unstemmed biface-knives). Group 2 consists of scrapers (three types), spokeshaves (one type) and undetermined scrapers. Group 3 consists of expedient flake tools (three types). Group 4 consists of cores and core/cobble tools and choppers, and Group 5 consists of undetermined tools (three categories). Debitage (41,042 pieces) was sorted into four size grades and according to presence or absence of cortex. Debitage was recovered in both ¼-inch mesh dry screen and 1/16-inch water screen. Ten material types were recognized; percentages are given for the material recovered from the standard ¼-inch screen: quartzite (41.5 percent); chert (40.6 percent); chalcedony (3.3 percent); and petrified wood (12.6 percent). The remaining six materials (basalt, obsidian, quartz crystal, sandstone, quartz, and granitic materials) comprise less than 2 percent of the standard debitage sample. Debitage analysis suggests that late-stage reduction and tool resharpening were the most important lithic reduction activities. Two hundred seventy-nine pieces of ground stone were recovered from the Early Ceramic deposits, and were classified according to eight subjective and metric criteria, including completeness, type, number of facets, type and amount of modification, nature of striations, and length, width and thickness.

The 83 sherds recovered were classified into two wares: cord-marked (n=73, 88 percent in four types) and plain ware (n=9, 11 percent in one type). All of the sherds are thought to be consistent with late to terminal Woodland ceramics on the Front Range. The plain ware is thought to probably represent a cord-marked ware on which the cord marks have been completely obliterated.

Faunal remains recovered from Magic Mountain include (in order of decreasing frequency in the 1996 assemblage based on minimum number of individuals [MNI]) were deer, pocket gopher, rabbit, western harvest mouse, elk, prairie dog, pronghorn, bison, gray wolf, beaver, possible mountain lion, mountain vole, deer mouse, 13-lined ground squirrel, snake, amphibian, and bird. The highly fragmentary nature of the large mammal bones suggests a substantial amount of bone processing. Protein residue analysis was performed on select lithic artifacts and the results indicated that deer, elk, and bison protein residues had the highest frequency of occurrence, and that minimally modified flakes were the most common tool used in faunal processing. This investigation also added turkey to the list of fauna utilized during the Early Ceramic and also indicated that a few pieces of ground stone were used in some manner for faunal processing.

Macrobotanical remains from 33 nonarboreal plants or arboreal seeds, both charred and uncharred, were recovered from flotation. Charred macrobotanical remains from the site indicate that bedstraw, wild buckwheat family, choke cherry, currant, dropseed, fungus fruiting body, grass family, lambs quarter, netleaf hackberry, fruity PET (processed edible tissue), pinyon pine, sunflower, and tansy mustard were economic plant species. Lambs quarter seeds were the most common, making up 59 percent of the total identified seeds recovered. Other uncharred remains that were thought to represent economic use of the plant were currants, chokecherry and raspberry/blackberry, all of which may have survived in the archaeological record by being culturally modified through drying.

One of the most interesting results of the Centennial excavations was the discovery of what was interpreted as portions of two superimposed habitation structures, Features 9 and 11. Feature 9 consists of a decomposed sandstone floor with an associated rock wall and discontinuous areas of dark fill and decomposed sandstone. Directly underneath and grading into Feature 9 is Feature 11, a large semicircular alignment of cobbles and boulders that was only partially excavated during the 1994 and 1996 seasons. These features are described in greater detail in the Early Ceramic Habitation Structures, below. Ten radiocarbon ages are associated with the Early Ceramic period deposits. 1930 ± 70 B.P., 2-sigma cal range 51 B.C.-A.D. 317, for the base of Feature 11; 1790 ± 60 B.P., 2-sigma cal range A.D. 80-414, for Feature 1; 1760 ± 50 B.P., 2-sigma cal range A.D. 132-417, for the base of Feature 11b; 1620 ± 60 B.P., 2-sigma cal range A.D. 261-599, for Feature 9d (east); 1370 ± 80 B.P., 2-sigma cal range A.D. 541-865, for the top of Feature 11; two identical ages of 1310 ± 70 B.P., 2-sigma cal range A.D. 607-937, both for Feature 9; 1220 ± 70 B.P., 2-sigma cal range A.D. 659-989, for Feature 12; 1110 ± 50 B.P., 2-sigma cal range A.D. 781-1023, for Feature 10; and 1070 ± 80 B.P., 2-sigma cal range A.D. 894-1025, for Feature 3.

LoDaisKa Site (5JF142). This multicomponent sheltered campsite is located 1.6 km (1 mi) south of Morrison and is situated under an overhang of the upthrust Fountain Formation sandstone, overlooking intermittent Strain Gulch (Irwin and Irwin 1959, 1961). The site contains Early Archaic through Early Ceramic occupations, and either through mixing of cultural deposits or methodological problems (sloping deposits were excavated by horizontal, arbitrary, 10 cm [4 inch] levels), there is a great deal of stratigraphic overlap between the recognized cultural complexes. This is true for the two identified Early Ceramic components; Complex A (51-122 cm [20 to 48 inches] below datum), which was thought to be related to the Fremont, and Complex B (76-134 cm [30 to 53 inches] below datum), which was considered to be associated with the Woodland culture.

The relationship between Complex A and the Fremont was thought to be reflected by the presence of small, corner-notched arrow points, some with asymmetrical notch placements and

asymmetrical shoulder lengths, some with serrated blade edges (Type bb); a plain ware ceramic bowl and a large sherd from a plain ware jar with a weak shoulder, both manufactured by coiling and scraping; the presence of three bone gaming pieces that are "almost duplicated" at Fremont sites in Utah and western Colorado (Irwin and Irwin 1959:129); and the presence of one kernel of Dent corn similar to corn grown in the Fremont area. Intermountain vessel forms include flat-bottomed jars and bowls; an alternative interpretation of the plain ceramics at both LoDaisKa and Magic Mountain is that they are probably not in fact Fremont but more likely Intermountain ware (J. J. Wood 1967:637). Plain ware ceramics are also reported to be common in Woodland assemblages along the Front Range (Kalasz and Shields 1997:167). The amount of overlap indicated between Complex A and Complex B and the difficulties encountered by Irwin and Irwin (1959:128-132) in the separation and interpretation of these components suggests that despite the interpretations presented by them in the monograph, it seems unlikely that any real separation can be made between these two components. Complex A extends from the surface (41 cm [16 inches] below datum) to 122 cm (48 inches) below datum. Complex B extends from 61 to 135 cm (24-53 inches) below datum, which represents a total vertical overlap between the two components of 61 cm (24 inches). This corresponds to 75 percent of the vertical range of Complex A and 83 percent of the vertical range of Complex B. Type bb projectile points are not exclusive to Complex A, and the majority of the plain ware ceramics were recovered from the overlap between the two components. Artifacts thought to be characteristic of Complex B include both large and small corner-notched projectile points, three types of parallel and crisscross cord-marked ceramics (including a sherd with impressions from a coiled basket and one sherd with a fabric impression) from wide-mouthed conoidal jars, end scrapers, drills, small ovoid knives, spokeshaves, awls, (splinter or extremely small sliver types), and large hafted knives or dart points. Other artifacts include tubular beads, small stone triangles (possibly gaming pieces), a shaft smoother, handstones, and milling slabs. One decayed cob of popcorn was found just below Complex B and may belong to this complex (Irwin and Irwin 1959:132). The faunal assemblage was dominated by deer, with bison, elk, bighorn sheep, prairie dog, gopher, bird, and canine also represented. Possibly economic floral remains from the Complex A/B strata include acorns, *Prunus* spp. (Wild plum or chokecherry), and *Muhlenbergia* sp.

Radiocarbon ages from the site overlap and appear out of sequence, adding evidence to support the hypothesis that there were problems with the excavation methodology. Provenience for radiocarbon samples was given as a range of inches below datum, and no possible relationship to any features was included. The radiocarbon ages corresponding to the Early Ceramic occupations are given as 1260 ± 150 B.P., 2-sigma cal range A.D. 537-1148, 102-127 cm (40-50 inches); 970 ± 150 B.P., 2-sigma cal range A.D. 694-1298, 102-132 cm (40-52 inches); 1150 ± 150 B.P., 2-sigma cal range A.D. 611-1213, 147-152 cm (58-60 inches); and 1150 ± 150 B.P., 2-sigma cal range A.D. 611-1213, 178-188 cm (70-74 inches)(Irwin and Irwin 1961). Obviously, the utility of these ages to define specific occupations in particular strata is limited.

Dutch Creek Site (5JF463). This multicomponent open campsite is located southwest of Denver on the east side of the Dakota hogback where Dutch Creek cuts through it (Gilmore and Baugh 1987; Gilmore 1989b; Jepson and Hand 1994; McNees 1989). Radiocarbon ages from features and artifactual material representing Middle Archaic, Late Archaic and Early Ceramic occupations were recovered from mitigation pits, backhoe trenches, test excavation units, and auger cores during four separate episodes of field investigation. Although the Early Ceramic component is the best represented, the material culture remains for all of these occupations is still sparse. Two small, corner-notched projectile points, one with serrated blade edges, were found in a stratum that

contained Feature 3, which had an associated age of 1220 ± 60 B.P., 2-sigma cal range A.D. 670-974. The only ceramic artifact found at the site, a finely cord-marked body sherd, came from the fill of Feature 3. Two medium sized, corner-notched dart points were associated with a terminal Late Archaic-Early Ceramic component dated by Feature 1, with an associated radiocarbon age of 1980 ± 50 B.P., 2-sigma cal range 60 B.C.-A.D. 131. Five late-stage bifaces and biface fragments, two end scrapers, a flake tool, and 46 pieces of debitage were recovered from the Early Ceramic component. A fragment of an unnotched point or preform was also recovered but was not assigned to any component. Lithic materials were dominated by Dawson Formation petrified wood, with quartzite, chert, chalcedony, and a small number of quartz flakes also present. The debitage assemblage was dominated by tertiary flakes. Considering the paucity of artifacts, tool manufacture and maintenance did occur, but reductive activities were not a major site activity. Faunal remains identified from Dutch Creek but not assigned to component included bison, pronghorn, elk, cottontail, jack rabbit, and marmot. An additional Early Ceramic radiocarbon age of 1430 ± 90 B.P., 2-sigma cal range A.D. 431-779 was provided from a sample of charcoal from a hearth designated Feature 4.

Willowbrook Site (5JF6). This sheltered camp is situated in a southwest-facing overhang of the Fountain Formation, 6 km (4 mi) southeast of Morrison (Leach 1966). Four stratigraphic units (Levels 1-4, from bottom to top) were recognized. Although Level 2 did contain a few pieces of charcoal, a few flakes and burned bone, most of the cultural material was recovered from Levels 3 and 4. Level 3 contained diagnostic artifacts and a radiocarbon age (2215 ± 75 B.P., 400 B.C. [351, 312, 206] 47 B.C.), indicating a Late Archaic component. The Woodland component was concentrated in Level 4, which contained small, corner-notched projectile points (n=6), half of which exhibited serrated blade edges; one triangular point with low side notches and a concave base; two unnotched points; two fragments of expanding base drills; a large corner-notched "blade" morphologically similar to the corner-notched points except for its size; three bifacial scrapers; two unifacial scrapers; and two core scrapers. Ground stone recovered from Level 4 included three unifacial manos, fragments of one metate, a ground stone granite axe head and a pestle manufactured from a piece of columnar gneiss. The only bone tool recovered from the site was an awl from Level 4. Ceramics were confined to Level 4 and consisted of 15 body sherds and one rim sherd. The paste is micaceous, the exterior is cord-marked, and manufacture is by paddle and anvil. The rim sherd is vertical, with parallel, diagonal, semiobliterated cord marks on the lip, and the unusual addition of what seems to be fingernail impressions around the interior of the rim. The Woodland component was thought to represent a more intensive occupation than during the earlier Archaic component, and even though hunting and gathering provided the majority of subsistence, "some simple horticulture" was thought to be a part of the subsistence pattern (Leach 1966:46). A radiocarbon age of 1290 ± 100 B.P., 2-sigma cal range A.D. 599-979, was associated with Hearth 3, near the bottom of Level 4.

Swallow Site (5JF321). This multicomponent open campsite is on the Ken-Caryl Ranch, adjacent to a southwest-facing vertical outcrop of the Fountain Formation, overlooking Docmann Gulch (Rathbun 1991, 1996; Rathbun and Hammond 1995; Hammond and Rathbun 1997, 1998). A permanent spring is located within 100 meters to the west of the site. Sediments at the site are a combination of colluvium and slope wash, with significant sand contributed directly from the decomposition of the sandstone that forms the shelter. Diagnostic artifacts include small, corner-notched projectile points and one cord-marked sherd. Feature 44 is an area of deformed sediments in the Woodland stratum and measures approximately 8 x 0.5 m; this feature is 3 to 4 m from the rock face and parallel to it and is interpreted as representing the base of a lean-to of poles that was

placed against the rock face and covered with hides or branches. Feature 102, with an associated radiocarbon age of 1370 ± 70 B.P., 2-sigma cal range A.D. 560-786, and Feature 130, with an associated radiocarbon age of 1240 ± 90 B.P., 2-sigma cal range A.D. 645-998, are both in stratigraphic contexts just below Feature 44, suggesting that Feature 44 postdates these features. Deer is the most common faunal remain, and numerous bone beads and bone awls were also recovered from the Woodland component. Other radiocarbon ages from the Woodland component include 1040 ± 80 B.P., 2-sigma cal range A.D. 850-1178, from Feature 117; and 1620 ± 60 B.P., 2-sigma cal range A.D. 330-590, from Feature 192. A radiocarbon age of 1880 ± 90 B.P., 2-sigma cal range 45 B.C.-A.D. 244, was returned for a piece of charcoal designated Feature 17, which was associated with human remains between 125 and 155 cm below present ground surface, at a depth that makes this recent an age anomalous. A final report for the Swallow site is said to be in progress.

Falcon's Nest Site (5JF211). This site is a sheltered multicomponent campsite on the Ken-Caryl Ranch, situated under and in front of a southwest-facing overhang in the upthrust Fountain formation, overlooking Docmann Gulch (Adkins 1993). Diagnostic cultural material from the Woodland component included various types of small, corner-notched projectile points, some exhibiting deep notches and barbs, some with serrated blade edges. The majority of these points seem to have been recovered between arbitrary levels 2-8. A total of 337 cord-marked sherds was recovered from the site, and 27 of these are rim sherds. Illustrated rim sherds suggest that rims were vertical, slightly incurving, or slightly outcurving, and cord marks were oblique to the rim and clear. Illustrated body sherds also indicate that cord marks are parallel and clear. Relatively few sherds (n=15) exhibit variations of the surface treatments exhibited on the majority of the sherds. These sherds exhibit various cross-hatches, fingernail marks, reedlike impressions, "stamped" ovate patterning, or obliterated marks. The majority of sherds apparently were recovered from arbitrary levels 1-4. Radiocarbon ages from the Woodland component are 1150 ± 70 B.P., 2-sigma cal range A.D. 691-1022, from Level 4 in Grid C7; 1130 ± 50 B.P., 2-sigma cal range A.D. 778-1019, from Level 4 in Grid F9; and 1100 ± 60 B.P., 2-sigma cal range A.D. 780-1148, from human bone in Feature 23, Levels 7-8.

Crescent Rockshelter (5JF148). This multicomponent sheltered campsite on the Ken-Caryl Ranch is situated in a rockshelter in the Dakota Sandstone in the Hogback Valley southwest of Denver (Adkins 1997; Stone and Mendoza 1994). Excavations at the site occurred in two episodes. Excavations by the Denver CAS chapter during the 1980, 1982 and 1983 field seasons are summarized in a short report by Adkins (1997). This document is concerned primarily with the history of the excavations at the site, and the cultural interpretation is abbreviated, with no descriptions of artifacts or features. Although the post-Archaic components are not mentioned, this report does contain a short summary of the Archaic occupations and their relationship with the Altithermal and a list of radiocarbon ages, including three Early Ceramic ages with grid coordinates and arbitrary level numbers, but no other stratigraphic or cultural context. Radiocarbon ages include 1370 ± 70 B.P., 2-sigma cal range A.D. 545-801; 1540 ± 70 B.P., 2-sigma cal range A.D. 390-653; and 1595 ± 100 B.P., 2-sigma cal range A.D. 236-659. A second report documents the field school excavations by the University of Colorado-Denver and Metro State College in 1992 and 1993 (Stone and Mendoza 1994). This report offers a unit by unit summary of the excavations, with little descriptive information pertaining to stratigraphy, features, and diagnostic artifacts, but does include statistical analysis of trends of lithic raw material use for certain tool types, which indicated no differential use of certain materials for particular tool types, except for a significant preference for locally available arkosic sandstone for ground stone

artifacts. A statistical analysis was performed to determine whether the relative proportions of three categories of chipped stone artifacts (formal tools, informal tools, and cores and debitage), changed over time, as represented by the grouped assemblages of three temporal groups (Paleoindian/Early Archaic, Middle Archaic, and Late Archaic/Woodland components), as well as a second statistical comparison of the relative frequency of lithic raw material use between these three temporal groups. Both analyses suggested that technology and lithic raw material procurement and use did not change significantly over time. Projectile points were analyzed and were compared to point types from sites in the area, but no stratigraphic associations or cultural interpretations are included. Sixteen corner-notched points were recovered from the 1993 excavations, however only nine of these were complete enough to be typed. Four are compared to type MM 23 Late Archaic dart points, and five are compared to type MM 35 arrow points. Two radiocarbon ages were derived from excavations during the 1992 UCD field season, 1440 ± 90 B.P., 2-sigma cal range A.D. 425-776, and 480 ± 70 B.P., 2-sigma cal range A.D. 1326-1627, both from hearths within a cluster of 16 overlapping hearths found in Unit S2E4. "Diagnostic projectile points" were recovered in the vicinity of these hearths, but none of these artifacts are described or documented in figures. Based on the above ages, the hearths were interpreted as representing "a very early through late Woodland occupation," although the presence of earlier point forms suggested an earlier date, and these units were assigned a transitional Late Archaic/Woodland affiliation (Stone and Mendoza 1994:104). Eight cord-marked sherds were recovered from the upper levels of Units S2E2 and S2E4. The above radiocarbon ages actually place these components in what is generally accepted as the middle Early Ceramic to the late Middle Ceramic period.

Bradford House II (5JF51) (Johnson and Lyons 1997a). This multicomponent sheltered camp on the Ken-Caryl Ranch is situated under and around a small, south-facing overhang in an outcrop of the Lyons Formation. Diagnostic artifacts from the Woodland component include 41 small, corner-notched projectile points, many with serrated blade edges, designated "Woodland corner-notched points." Most of these points were thought to have been reworked. Half of the corner-notched points (n=21) retain a portion of the unmodified ventral surface of the flakes from which they were manufactured from, and several retain the curve of the original flakes. Fourteen large, triangular, corner-notched projectile points are also assigned to the Woodland component. Other chipped stone artifact categories include small triangular unnotched bifaces (n=14), triangular knives (n=5), ovate knives (n=11), lateral bifaces (n=3), hafted bifaces (n=7), biface fragments of all manufacturing stages (n=103), choppers (n=2), drills, (n=6), end scrapers (n=10), scrapers (n=18), gravers (n=6), retouched flakes (n=6), prismatic flakes (n=2), one multipurpose tool, and one microtool. Bone artifacts include awls (n=9), one tubular bird bone bead, one reamer, bone scrapers (n=14), bone drills (n=2), and three fragments of antler flakers. Ground stone includes eight types of manos (n=27), 56 metate fragments, and five palettes; the latter were thought to have been used for either grinding pigment or possibly as a cooking surface, and were recovered only in Woodland contexts. Seven cord-marked body sherds thought to represent one vessel were also recovered. Other miscellaneous items associated with the Woodland component include four rounded, fluvially smoothed but otherwise unmodified amphibolite pebbles, a slightly flattened cylinder of chalk, and a small, rounded piece of freshwater shell. Faunal remains from 18 species of mammal, one turkey, and one bull snake were identified. The most important mammal species in order of occurrence based on MNI included mule deer (n=42), elk (n=17), rabbit (n=15), bison (n=9), pronghorn (n=4), beaver (n=3), porcupine (n=2), *Canis* sp. (n=2), and bighorn sheep (n=1). The remaining mammals included bobcat, skunk, racoon, and six species of rodents.

Bradford House III, 5JF52. This multicomponent sheltered campsite on the Ken-Caryl Ranch is situated in a southwest facing overhang in the Fountain formation sandstone (Johnson and Lyons 1997b). Five cultural strata were identified during the excavation of the site, and the upper three of these contained material cultural that was assigned a Woodland affiliation. Because of the difficulty in correlating these strata across the site, few profiles were drawn, and because the field notes were somehow discarded, the three Woodland cultural strata were combined into one unit for analytical purposes. Artifacts were classified into types similar to those recognized for Bradford House II. Diagnostic artifacts from the Woodland component included 216 small, corner-notched projectile points, many with serrated blade edges, designated "Woodland corner-notched points." The bases of these points are described as straight, convex, or concave, and blades may be asymmetrical regarding the placement and depth of the notches, and one or both edges may be serrated. Many of these corner-notched points retain a portion of the unmodified ventral surfaces of the flakes from which they were manufactured from, and several retain the curve of the original flake. Eleven large, triangular, corner-notched projectile points are also assigned to the Woodland component. Other chipped stone artifact categories included small triangular unnotched bifaces (n=56), hafted knives (n=3), oval to triangular knives (n=29), notched bifaces with rounded bases (n=3), biface fragments of all manufacturing stages (n=120), preforms (n=10), drills, (n=13), hafted perforator (n=1), end scrapers (n=27), scrapers (n=35), gravers (n=4), combination tools (n=2), retouched flakes (n=29), microtools (n=14), and polyhedral cores (n=3). Bone artifacts included one flaker, awls (n=5), one pointed tool, one worked deer scapula, one bipointed tool, one canid tooth with an annuler groove around the root and thought to be a pendant, tubular mammal bone beads (n=9), one bone disk, one piece of incised bone (possibly a gaming piece), miscellaneous pieces of broken, polished or incised bone that may represent pieces of broken tools or early manufacturing stages of bone beads, and four fragments of antler tools, possibly flakers and/or perforators. Ground stone included six types of manos (n=42) and indeterminate fragments (n=18), metate fragments (N=145), and palettes (n=2). Miscellaneous artifacts included a piece of amazonite with one ground facet, a piece of graphite with three ground facets, and a drilled stone pendant. One hundred-fifty cord-marked sherds, including nine rim sherds, were recovered from the Woodland component. The vessel shape was conoidal, with a vertical to slightly in sloping round to beveled rim, and cord marks are oblique to the rim. The vessel was finished by paddle and anvil, and the initial construction was thought to possibly be coiling based on examination of the paste in the broken edges of some of the sherds, which exhibit "waviness." No coil marks were observed, and the sherds do not break along what could be construed as horizontal coil junctures. These sherds are thought to represent one vessel. Features from the Woodland components included 15 hearths full of fire-cracked rock, and several horizontal concentrations of fire-cracked rock. Three radiocarbon ages are available from the Woodland components; two are from the same feature (Feature 16) and were averaged, although they were thought by the radiocarbon lab to represent two separate ages. These ages are 1225 ± 55 B.P., 2-sigma cal range A.D. 672-965, and 1270 ± 95 B.P., 2-sigma cal range A.D. 605-988, both from Feature 16 (the average of the Feature 16 ages is 1245 ± 55 B.P., 2-sigma cal range A.D. 660-977), and 1520 ± 55 B.P., 2-sigma cal range A.D. 422-652 for Feature 4.

Window Rock Site (5DA306). This stratified open campsite is situated on a knoll and the lower south-facing slope of the Lyons hogback, overlooking Willow Creek within Roxborough State Park, southwest of Denver (Tate 1979; OAHP files). One small, corner-notched projectile point similar to type MM 34 from Magic Mountain was found on the surface of the site in a sparse lithic scatter, and several stone lined hearths as well as a projectile point similar to the Middle Archaic Duncan type were found eroding out from the cutbank of a gully on site. Samples collected from

two of these hearths returned radiocarbon ages of 1460 ± 90 B.P., 2-sigma cal range A.D. 419-767 within the Early Ceramic period, and 1970 ± 50 B.P., 2-sigma cal range 50 B.C.-A.D. 136, which just prior to the transition between the Late Archaic and the Early Ceramic period. Apparently, no cultural material was found in direct association with these hearths. The radiocarbon ages were processed by OAHP personnel after the publication of the Roxborough Park survey report (Tate 1979), and are on file at OAHP.

Hall-Woodland Cave (5JF9). This single component sheltered campsite west of Golden is situated in a narrow, relatively deep (3 x 6 m) southeast facing cave in the Idaho Springs formation, overlooking Magpie Gulch (Nelson 1967). One cultural stratigraphic unit was found, sandwiched between culturally sterile surface and basal strata. Seventeen projectile points were recovered and placed in two types. Twelve of the points were illustrated. Three small, side-notched points, two of these with basal notches, were found within the cultural stratum and from undetermined proveniences, as were 14 corner-notched points. Two of these points are relatively large and may be dart points. Six of the seven remaining illustrated corner-notched points apparently have serrated blade edges, based on the artifact drawings. Other artifacts include three bifaces classified as knives, two gravers, two scraper/utilized flakes, one metamorphic rod manuport, two hammerstones, six bifacial manos, and two slab metates. Fifteen cord impressed sherds, including two rim sherds were also recovered. The cord impressions are parallel and vertical to the rim. The faunal remains were highly fragmented, probably the result of marrow extraction. Three-quarters of the identifiable faunal remains were mule deer, with very small percentages of cottontail rabbit, meadow mouse, dog, elk, and bison. The site is thought to represent a series of short, winter occupations, based on the amount of charcoal and occupational debris in the portion of the cave that is illuminated by the sun during the winter months, and by the highly fragmented nature of the faunal remains, suggesting that efficient processing was necessary due to scarcity of game.

Van Bibber Creek Site (5JF10). This site is a multicomponent open campsite situated on the south bank of Van Bibber Creek, 5 km (3 mi) northeast of Golden (Nelson 1969). Three cultural strata were recognized (Zones A, B, and C). Zones C and B were considered to be preceramic, and a radiocarbon age of 2140 ± 145 B.P. from Zone C confirms the Late Archaic affiliation of this stratum, and the widths of the haft elements projectile points recovered from Zone B suggest that this zone also represents a Late Archaic component. Three types of projectile points were recovered from Zone A. Seven small, corner-notched points with convex bases and unserrated blade edges, four side-notched points with straight bases and unserrated blade edges, and one triangular, unnotched point that was thought to represent a point preform were all recovered between 7 and 15 cm (3-6 inches) from the present ground surface. Other chipped stone artifacts included five late-stage biface "cutting tools," two "scraping tools" that appear to be end scrapers, and one well-made drill with the tip missing. Other artifacts included four complete bifacial manos, and a bifacially ground metate, all of metamorphic rock; and one smoothed fragment of a chalky stone that is interpreted as an atlatl weight. Numerous fragmentary manos and metates were found throughout Zone A. Twenty-eight sherds (15 cord-marked [including one rim sherd], 10 surface roughened, and three plain ware) were recovered from Zone A. The impressions on the cord-marked sherds were oblique to the rim, which was slightly incurving, and fracture of the sherds suggests manufacture by patch construction, with finishing by paddle and anvil. The surface-roughened sherds fractured along straight lines, which was interpreted as possibly representing coiling, with finishing by paddle and anvil. The micaceous clay was used in the manufacture of both of the above types of pottery. The plain ware sherds are too fragmentary for meaningful description, but appeared to have been made from clay different from the above two

types. Zone A is dated by a sample of charcoal collected 33-43 cm (13-17 inches) below the ground surface from a hearth exposed in the cutbank of Van Bibber Creek by Richard Van Horn in 1956, likely during fieldwork for the geologic map of the Golden quadrangle . This portion of the site was destroyed prior to the excavation of the remainder of the site by Nelson in 1967, and was at least 6-8 m north of Nelson's excavations according to the site map. A radiocarbon age of 1050 ± 250 B.P., 2-sigma cal range A.D. 541-1408, was returned for this sample. An obsidian side-notched point recovered from the same hearth returned a hydration date of 800 B.P., A.D. 1150. Zone A was interpreted as representing a Parker focus component (Withers 1954), and Nelson suggests that the presence of plain ware ceramics with Woodland components may indicate contact and influence or trade relationships between Woodland people of the plains and hogbacks/foothills and Shoshonean people of the mountains.

George W. Lindsay Ranch Site (5JF11). This site is a single component open camp with architecture situated on the top of a ridge formed by the upthrust Fox Hills sandstone (Nelson 1971). The site is located approximately five miles north of Golden, in northern Jefferson County. The site contains two square enclosures of piled rocks, thought to have functioned as foundations for superstructures. The structures are described in greater detail in the Habitation Structures section below. Projectile points (n=44) associated with these structures were small to medium in size, with corner notches; some notches were deep enough to give the points tangs. More than 50 percent of these points have serrated blade edges. Other chipped stone tools included seven ovoid knives or point preforms, three scrapers, one knife, and 19 utilized flakes. One ground stone fragment, two polished stones similar to those recovered from the Woodland component at Magic Mountain, and 27 cord-marked body sherds were the only other documented artifacts. The site was interpreted as a seasonally occupied hunting camp. Based on this site and others along the foot of the Front Range and into the hogbacks/foothills, Nelson (1971) proposed the "Hog Back Phase" (Hogback complex) which among other defining traits were seasonally occupied hunting camps, a high frequency of serrated blade edges on small, corner-notched points, and Woodland pottery. These sites are thought to have been inhabited by people whose subsistence and settlement patterns were oriented primarily toward to the hogbacks/foothills and mountains, and even though they shared technological similarities with the Woodland cultures of the plains, Nelson (1971:12) thought there were similarities between the material culture of these groups and that from Shoshonean sites in the mountains. He also believed that there was insufficient data to determine what the possible relationship between "Hog Back Phase" and Shoshonean groups might be.

Cherry Gulch Site (5JF63). This site is a multicomponent open campsite overlooking Cherry Gulch, in a small valley between the Lyons Formation hogback and a low ridge of the Lykins Formation, just south of Golden (Nelson 1981). This site is best known for the dated Archaic components it contains; however, a small undated Woodland component is also present. Six medium to small, corner-notched projectile points (some serrated), two scrapers, and five cord-marked Woodland sherds were recovered from the upper levels of the site and given a Hogback phase affiliation.

Dancing Pants Shelter (5DA29). This multicomponent sheltered/architectural campsite is situated on a moderate slope on the east bank of the South Platte River, approximately 5 km (3 mi) south of its confluence with the North Fork of the South Platte (Leistman and Kranzush 1987). Few artifacts could be associated conclusively with the Early Ceramic (Woodland/Formative) component. No diagnostic Early Ceramic projectile points or ceramics were recovered from the

site. One projectile point with a slightly expanding stem and abrupt shoulders was found in direct association with Feature 4, which had a radiocarbon age of 1230 ± 70 B.P., 2-sigma cal range A.D. 662-979. This point is relatively thick (7 mm) and the haft width (13 mm) suggests that it was used with a dart. The point is morphologically similar to Archaic types dated to 4000-5000 B.P. The contents of Feature 4 included bone from bighorn sheep, bone of an unidentified large mammal, and *Chenopodium* seeds. An additional Early Ceramic radiocarbon age of 1070 ± 70 B.P., 2-sigma cal range A.D. 819-1156 was returned from Feature 5, a deposit of ashy soil above a posthole associated with an Archaic lean-to. Four radiocarbon ages falling into a span of time usually considered part of the Early Ceramic period (between 1480 ± 90 B.P. and 1740 ± 70 B.P.), were assigned to the Late Archaic component.

Helmer Ranch Site (5DA123, K:12:6). This site and the following two sites are mentioned by Scott (1963:46-48) in the context of dating Holocene deposits in the Kassler area southwest of Denver. Arnold Withers of the University of Denver Department of Anthropology apparently shared information from these sites that is otherwise unpublished. Collections from these sites are curated at DU, and were briefly examined by the author for this report.

"Artifacts and pottery of the Woodland culture" were reported from the post-Piney Creek alluvium at the Helmer Ranch site, located just outside the boundary of Roxborough State Park. Not many details are available, but the site is described as containing projectile points, scrapers, choppers, metates, manos, bone awls, dark-gray pottery and fragments of bone. A sample of charcoal from this site returned a radiocarbon age of 1490 ± 160 B.P., 2-sigma cal range A.D. 236-886. Artifacts from the site observed in the collections at DU included five small, corner-notched arrow points, nine corner-notched and stemmed dart points, including a Park point, a large (9.5 cm long) corner-notched knife, and a few body sherds with fine, deep cord marks.

Rainbow Creek (5DA124, K:12:7). This site is located on the north bank of Rainbow Creek in a deposit of eolian sand overlying the Lyons Formation (Scott 1963). The site is described as a Woodland camp. Part of a large ceramic jar "almost 2 feet high and 1½ feet in diameter" with deeply impressed vertical corrugations was recovered among other unspecified artifacts. The sherds from this jar ranged in thickness from 3-6 mm (1/8 to 1/4 inches). The pottery was referred to as "Parker focus of the Woodland culture" by Arnold Withers. Charcoal from the fill of the vessel returned a radiocarbon age of 1360 ± 200 B.P., 2-sigma cal range A.D. 256-1037. The site form lists 15 corner-notched points, one blank, one large triangular point, three bases of small triangular points, five knives, two gravers, two "ocher stones," one bone, one polished pebble, one end scraper, three partial large blades, 19 flake scraper-knives, and 15 miscellaneous flaked objects. Cursory examination of the collection revealed that at least three of the corner-notched points are dart points, one is a stemmed dart point or knife, and one large point fragment has two basal notches. Ceramics consist of body sherds that exhibit fine, parallel cord marks.

Jarre Creek Site, 5DA541 (K:12:9). Located on the north side of Jarre Creek, this site is found within a deposit of loess that overlies Rocky Flats alluvium (Scott 1963). Pottery from the site is described as "light gray, and the jars have shallow diagonal corrugations and deep vertical corrugations." These ceramic jars were assigned to the Franktown focus by Arnold Withers. The artifacts were described as similar to those of Rainbow Creek, but some of the projectile points from Jarre Creek were side-notched and "resemble points of the Upper Republican culture." A small, triangular point with very shallow corner notches, two fragments of small, side-notched points with concave bases, and a great number of relatively small sherds among other materials

were observed during examination of the collection from this site at DU. The body sherds exhibit partially obliterated to completely obliterated cord marks. An incurving rim sherd with obliterated cord marks has a rounded lip and three round punctations approximately 1 cm below the rim. Next to this group of punctations are two crescentic grooves, which begin vertically and curve to the left where they intersect the broken edge of the sherd. The width of the grooves and the punctations are the same, and so were probably made by the same tool when the clay was still plastic. A charcoal sample gathered from a hearth returned a radiocarbon age of 900 ± 250 B.P., 2-sigma cal range A.D. 654-1473.

Jackson Creek (5DA603). This single-component prehistoric open campsite is situated on a terrace overlooking Jackson Creek at the foot of the Rampart Range, 16 km (10 mi) southwest of the town of Castle Rock (Wynn et al. 1985). The cultural materials are contained within sediments identified as post-Piney Creek alluvium, which overlies the Piney Creek alluvium. Early Ceramic occupations are represented by five classifiable projectile points, two of which are small with corner notches, and three are unnotched. Other chipped stone artifacts include knives (n=9), three of which are ovoid bifacial knives, perforators (n=3), flake scrapers (n=6), core scrapers (n=4), modified flakes (n=10), flakes (n=1361), and cores (n=32). Three cord roughened body sherds and a fragment of a unifacial mano were also recovered. One feature is a jumble of stone and charred logs 5-10 cm in diameter that may have been a structure of some sort, the nature of which is unknown due to indeterminate stratigraphic associations of the different elements. Several other enigmatic features were present; however, because of stratigraphic overlap of these concentrations of rock and charcoal, none of the features could be defined. Four radiocarbon ages were recovered from the site: 1230 ± 60 B.P., 2-sigma cal range A.D. 667-968; 1280 ± 60 B.P., 2-sigma cal range A.D. 653-889; 1590 ± 70 B.P., 2-sigma cal range A.D. 267-630; 1680 ± 50 B.P., 2-sigma cal range A.D. 248-532. The site is interpreted as representing a specialized camp, possibly to process animals, although only one nondiagnostic fragment of long bone from a medium-sized mammal was recovered.

Mountains

Joe Wright Site (5LR220). This site was originally published as 5LR450. This multicomponent open campsite is situated on and between several glacial moraines overlooking Joe Wright Creek at an altitude of 3033 m (9950 ft), 3 km (1.9 mi) northeast of Cameron Pass (Morris and Marcotte 1976a, Elizabeth Ann Morris, personal communication 1999). Cultural material from Late Archaic and Late Prehistoric occupations is for the most part contained in mixed context within the uppermost 15 cm of a 20-25 cm thick layer of loess deposited on glacial till. Two basal fragments from large corner-notched projectile points define the Late Archaic component; one of these points was found in direct association with Feature 4, which had a radiocarbon age of 2000 ± 60 B.P., 2-sigma cal range 158 B.C.-A.D. 130. Two fragments of small corner-notched projectile points were also recovered from the site, in addition to five nondiagnostic point fragments, five bifaces, four end scrapers, 13 whole and fragmentary side scrapers and 1,222 unmodified and utilized flakes. No ceramic or ground stone artifacts were recovered. Lithic raw materials included white chalcedony and quartzite. A sample of charcoal from Feature 2 returned a radiocarbon age of 1690 ± 70 B.P., 2-sigma cal range A.D. 220-542, but the feature was not associated with any diagnostic cultural material. Site activities were interpreted as including seasonal harvesting of high-altitude plant and animal resources, secondary tool manufacture, meat processing and camp activities. In addition, the site may be associated with population movement between the Cache la Poudre drainage and North Park due to its proximity to Cameron Pass.

Flattop Mountain (5LR6), and Trail Ridge, (5LR15) Game Drive Sites. One group of sites in the alpine zone of the Front Range that has received more intensive scrutiny than any other is the estimated 50 stone game drive systems in a 35 km (22 mi) long section of the Front Range crest between James Peak and the southern boundary of Rocky Mountain National Park. This area has been the subject of decades of research reported in a series of articles and monographs by James B. Benedict. Benedict's research is wide reaching both topically and temporally, and has contributed almost all of the radiocarbon ages for archaeological sites at or above tree line in the mountains of Colorado. Although the discussion of the game drive systems and campsites described below deals with the Early Ceramic components, many of the game drive systems exhibit evidence of multiple episodes of construction and use from the late Paleoindian stage to the Protohistoric period, based on radiocarbon ages as well as relative dating techniques such as rock weathering and lichenometry, which allows correlation to dated episodes of Holocene glaciation.

Both the Flattop Mountain and the Trail Ridge game drive sites are located in Rocky Mountain National Park, west of Estes Park (Benedict 1996). The Flattop Mountain site is a multicomponent game drive system situated on the upper northeast slopes of Flattop Mountain, at the headwaters of the South Fork of the Big Thompson River. This site is one of the most extensive complexes of prehistoric game drive walls, blinds, and cairns in the Colorado high country. Fourteen stone drive walls, 848 cairns, 90 blinds and possibly a hunter's bed belonging to nine separate systems were mapped, and perhaps many more structures could have been overlooked during mapping. Using various dating methods (radiocarbon, lichenometry, and rock weathering) two major episodes construction is thought to have occurred, the first during the Early Archaic Period and the second between the terminal Late Archaic period to the Protohistoric. Based on the number of blinds in each system, and assuming one person per blind, the number of people needed to operate the drive systems ranged from 50 for the largest to six for the smallest. The drive systems could have been clear of snow and used to hunt bighorn at any time during the summer or fall. The vast majority of the diagnostic projectile points recovered from the game drive system are Early Archaic types, but nine small, corner-notched points, four with serrated blade edges, were assigned to the Hogback phase. Eight of the nine points are manufactured of material from Middle Park lithic sources. Eleven Early Ceramic radiocarbon ages from hunting blinds range between 1740 ± 60 B.P., 2-sigma cal range A.D. 139-428, and 880 ± 60 B.P., 2-sigma cal range A.D. 1022-1281.

The Trail Ridge site consists of three converging stone walls and five circular or semicircular blinds (Benedict 1996). Three small, corner-notched points assigned to the Hogback phase were found in the kill area. Two of the three points were manufactured of jasper from the Table Mountain quarry in Middle Park. Elk and possibly mule deer were probably the animals hunted in this system. The only two radiocarbon ages from blinds at the site fall in the Middle and Late Archaic periods, and it was assumed that the system was constructed during this period. Little modification occurred during subsequent use during the Early Ceramic period, represented by the Hogback Corner-notched points and rock weathering data indicating that one of the walls was added to between A.D. 650 and 910.

Bode's Draw (5LR1370). This multicomponent open campsite is situated on a grassy north-sloping alluvial fan overlooking a spring-fed wetland, 6 km (4 mi) northeast of Estes Park in southwest Larimer County (Benedict 1993). Four stratigraphic units, numbered 1-4 from bottom to top, were identified for the three excavation areas at the site (A, B, and C). Most of the cultural material was recovered from Unit 3. Three small corner-notched projectile points, two of which

had serrated blade edges, were assigned to the Hogback phase. Edge wear on all three points suggests that they were used as knives after first serving as projectile points. Two of the three points, and possibly the third, were manufactured from Kremmling chert, found in Middle Park. Other chipped stone artifacts included pressure flaked ovoid bifaces (n=5), cutting, scraping and graving tools (n=3) and utilized flakes (n=29). Lithic raw materials were dominated by stone from Middle Park sources (>75 percent). Ground stone artifacts included pieces of seven bifacial manos and 106 pieces of at least 19 grinding slabs. Several of the fragments of ground stone associated with the Early Ceramic component were conjoinable with fragments from the Late Archaic component. This was thought to represent scavenging and reuse of Late Archaic ground stone by the later Hogback phase people, who broke it up to use it for stone boiling. Three handstones and three grinding slabs were Lyons sandstone, the only known material represented in the assemblage imported from the eastern foothills. Bone tools included six artiodactyl long bone fragments that exhibited use wear consistent with scraping or rubbing soft materials (interpreted as hide working implements), one splinter awl made from a jack rabbit long bone, the distal epiphysis of the humerus of a juvenile bison that has a beveled edge interpreted as a tool used to roughen hides so they would absorb the tanning solution more readily, and a split mule deer long bone thought to have been a beamer, used to remove hair from hides. Faunal remains from the Early Ceramic component were almost entirely fragments of artiodactyl bone, most burned, that were too small for species identification. The presence of two large roasting features, one dating to the Late Archaic period and one with an associated age of 910 ± 80 B.P., 2-sigma cal range A.D. 995-1284, and the artifacts listed above, led to the interpretation of the site as representing a women's work area, where food processing (roasting and grinding), marrow extraction, and hide preparation were performed. This interpretation was based on historical ethnographic accounts of gender divisions of labor among several Plains groups. Additional Early Ceramic radiocarbon ages were 820 ± 80 B.P., 2-sigma cal range A.D. 1030-1284 for Feature 3, a basin hearth where two of the three projectile points were recovered in vertical and horizontal proximity; and two ages that may not be cultural in origin, but are used as stratigraphic ages that predate the Early Ceramic component, 1510 ± 55 B.P., 2-sigma cal range A.D. 428-637, and 1515 ± 55 B.P., 2-sigma cal range A.D. 426-635.

Murray Game Drive Site (5BL65). This multicomponent game drive system is situated near the summit of Mount Albion, close to the Continental Divide at the headwaters of Boulder Creek, approximately 29 km (18 mi) west of the town of Boulder (Benedict 1975b). The Murray site consists of 483 cairns, 13 stone walls, and 16 circular, semicircular, or oval rock-walled pits. The function of the system was to guide large grazing animals from a grassy saddle between Mount Albion and Kiowa Peak to the narrow crest of Albion Ridge, where they were ambushed and killed by hunters concealed in rock-walled pits. Of the 16 pits, 14 were in the kill area. This number of pits suggested that the minimum number of people involved in each hunt was 20-25. Each pit was tested, and 11 were excavated. Three of the pits contained cultural material, including 25 whole and fragmentary projectile points. Twenty-two of these were small, corner-notched points, at least 15 of which exhibited serrated blade edges, that were assigned to the Hogback phase. A radiocarbon age of 970 ± 100 B.P., 2-sigma cal range A.D. 885-1279, was returned for charcoal from the floor of Pit 1. A radiocarbon age of 670 ± 150 B.P., 2-sigma cal range A.D. 1032-1611 and two small, triangular, side-notched projectile points recovered from Pit 4 are evidence that the game drive system was reused by an unknown culture during the Middle Ceramic period. Other artifacts recovered included a triangular end and side scraper, a bifacial knife, a flanged drill, and 197 small pressure retouch flakes representing the on-site modification of at least 15 other tools. Cryptocrystalline materials dominated the debitage assemblage.

Scratching Deer Site (5BL69) and Site 5BL68. The Scratching Deer site is a single component campsite situated in the upper fringes of the subalpine forest in western Boulder County, below the crest of Albion Ridge (Benedict 1975c). Few tools were recovered during excavation, but analysis of more than 300 plus waste flakes suggests that large numbers of cutting and scraping tools were resharpened and new tools were manufactured. Six small, corner-notched projectile points were recovered, some with serrated blade edges, and four of the six exhibited some amount of basal grinding. A fragment of a large chalcedony biface and highly fragmented milling slab of Lyons sandstone were the only other tools recovered. The occupation was given a Hogback phase affiliation, and one of the two hearths returned a radiocarbon age of 1260 ± 95 B.P., 2-sigma cal range A.D. 626-990. The site is located in an area that would be convenient for prehistoric people making use of the game drive systems in the alpine meadows above the camp. One of these game drive sites, 5BL68, is estimated to have been built 5000 to 6000 years ago, but an episode of reuse during the occupation of Scratching Deer is indicated by radiocarbon ages of 1360 ± 180 B.P., 2-sigma cal range A.D. 340-1023 for Blind 15, and 1230 ± 360 B.P., 2-sigma cal range A.D. 71-1426 for Blind 16, both of which are circular enclosures associated with a drift fence.

Coney Lake Site (5BL94). This multicomponent open campsite is situated in a sub-alpine forest clearing close to timberline (Benedict 1990). A culturally sterile basal till unit (Unit 1) and five thin, laterally discontinuous cultural strata above the till were identified during excavations. Eleven Hogback Corner-notched projectile points were found in stratigraphic Units 3-6. Seven points were of Table Mountain jasper and four were of Kremmling chert, both Middle Park sources. Other artifacts that could be assigned to the Hogback component included two percussion flaked bifaces, a pressure flaked biface, and a unifacial flake scraper. Twenty-eight otherwise unmodified flakes were used as knives or scrapers. Several of the projectile points showed evidence of secondary use as cutting tools, drills, and punches. One grinding slab and some grinding slab fragments of Lyons sandstone are possibly associated with this component. The Hogback component was thought to represent a series of short-term visits by hunting parties recently arrived from Middle Park. Activities were limited to secondary butchering, hide preparation, tool manufacture and maintenance, and working of wood or bone. Based on the similarity of debitage material recovered from the hearths to the materials used to manufacture the diagnostic projectile points, radiocarbon ages are associated with the Early Ceramic Hogback component. These ages include 1200 ± 90 B.P., 2-sigma cal range A.D. 659-1017 for Feature F; 1210 ± 80 B.P., 2-sigma cal range A.D. 662-1006 for Feature D; 1360 ± 80 B.P., 2-sigma cal range A.D. 551-873 for Feature B; and 1430 ± 80 B.P., 2-sigma cal range A.D. 444-772 for Feature E. A hearth (Feature G) with an associated radiocarbon age of 1585 ± 90 B.P., 2-sigma cal range A.D. 254-653, is associated with the Late Archaic component containing Coney Lake Corner-notched dart points. Two of the points were directly associated with the charcoal sample from the hearth. This component apparently predates introduction of the bow and arrow to the area.

Twin Tunnels Site (5CC389). This open campsite is situated on a terrace remnant at the confluence of Clear Creek and an unnamed intermittent tributary, just east of Idaho Springs in northeast Clear Creek County (Hand and Pearce 1990). Four natural strata (Strata 1-4, bottom to top) were identified during excavation of two 1 x 1 m test units. Stratum 3 contained an Early Ceramic component. Artifacts from that component included one small, corner-notched projectile point with unserrated blade edges, one cord-marked ceramic sherd, one biface, one biface fragment, one scraper, 22 unmodified flakes, and many small pieces of bone, some burned. The only identifiable faunal remains were a scapula fragment of a deer, sheep, or pronghorn, and a piece of bone tentatively identified as *Ovis* sp. No features were encountered, but a charcoal sample from Stratum 3

returned a radiocarbon age of 1600 ± 60 B.P., 2-sigma cal range A.D. 339-607. The Early Ceramic component in Stratum 3 was underlain by a Late Archaic component in Stratum 2.

Muad'dib Site (5JA58). This multicomponent open campsite is situated in a depression between two sand dunes, in the North Sand Hills, an area of active sand dunes on the northeast margin of North Park, 18 km (11 mi) northeast of Walden (Gordon and Kranzush 1978a, 1978b). Cultural material observed on the surface included a large, corner-notched projectile point/knife, a bifacial mano and other fragments of ground stone, and lithic debitage representing all stages of reduction. Fine-textured quartzite and cryptocrystalline silicates dominated the chipped stone assemblage. Several concentrations of fragmentary and unidentifiable bone were also observed. A sample from a charcoal and ash lens exposed in a dune slope 2.5 m above the main concentration of cultural material returned a radiocarbon age of 1485 ± 220 B.P., 2-sigma cal range A.D. 81-1009. A second sample of charcoal, burned bone, and ash-stained sand recovered from this feature during the next field season returned a radiocarbon age of 995 ± 75 B.P., 2-sigma cal range A.D. 969-1253. The expanding stem of a large corner-notched projectile point/knife was found in the vicinity of the hearth during the second episode of fieldwork. The second radiocarbon age was thought to be a more accurate measure of the age of the site than the first, although the two large, corner-notched bifaces recovered were interpreted as dart points.

Site 5JA1068. This single-component open campsite is situated on a bench on the west slope of a large ridge, 600 m east of McKinnon Creek, in North Park (Harrison and Tate 1997; Hood et al. 1998). Cultural material observed on the surface included fragments of several bifaces, the base of a Late Prehistoric projectile point and the base of a Late Archaic projectile point, an end scraper, a metate fragment, a small amount of lithic debitage, and two rock-filled hearths exposed on the surface. Two test units, one over each of the hearths, were excavated. A sample of charcoal from Feature 2 returned a radiocarbon age of 1530 ± 100 B.P., 2-sigma cal range A.D. 340-680.

Site 5PA153. This multicomponent open campsite is situated on a low rise next to an island of krummholz spruce-fir close to tree line in the valley of South Mosquito Creek, on the western edge of Park County (Schubert et al. 1981). Four natural stratigraphic units were identified, including a basal till. Three types of projectile points were recovered from excavations at the site: small, corner-notched points (n=4), the two complete examples with serrated blade edges; large stemmed dart points with abrupt shoulders (n=3); and one small side-notched point. Other artifacts recovered included two bifaces, two side scrapers, four "flake blades" (retouched and utilized flakes), and 72 pieces of debitage, representing 13 varieties of chert, one type of gray quartzite, and quartz crystal. The site was thought to have been occupied between June and October, based on the persistence of on site snow cover. Based on the presence of thinning and retouch flakes and edge wear on tools, site activities included tool maintenance and butchering. No features were encountered during excavations, but nine radiocarbon ages were returned for charcoal samples derived from the screened matrix from various arbitrary levels. These ages, which show no direct correlation between depth and age and were associated only with arbitrary 5 cm levels, not with natural stratigraphy, serve as an example of the problems that can be encountered with samples that are not derived from primary in situ contexts such as features. The ages and proveniences were 1760 ± 150 B.P., 2-sigma cal range 45 B.C.-A.D. 620 for Level 4; 1390 ± 135 B.P., 2-sigma cal range A.D. 411-962 for Level 5; 1425 ± 90 B.P., 2-sigma cal range A.D. 434-781 for Level 6; 1560 ± 90 B.P., 2-sigma cal range A.D. 263-660, also for Level 6; 1410 ± 155 B.P., 2-sigma cal range A.D. 340-973 for Level 7; 1415 ± 100 B.P., 2-sigma cal range A.D. 429-853 for Level 7; 1640 ± 110 B.P., 2-sigma cal range A.D. 140-647, also for Level 7; 1345 ± 75 B.P., 2-sigma cal

range A.D. 597-880 for Level 8; and 1575 ± 155 B.P., 2-sigma cal range A.D. 127-774 for Level 9/10.

Early Ceramic Burials

One of the greatest obstacles archaeologists have to contend with in trying to develop an understanding of the cultures of the prehistoric people of the Platte River Basin, is the paucity of symbolic or ideological information that can be derived from the artifact assemblages associated with small, nomadic populations. Much of the archaeology that has been done, including the excavation of large, complex campsites, results in somewhat minimal interpretations of the interaction between people and the environment, and the technologies used in this interaction. It is not difficult to hypothesize that these artifacts could have a completely different meaning in different contexts, in fact, it should be expected. However, unless this difference in physical context survives the transformation from cultural context to archaeological context, the evidence of the mental constructs of our informants is completely lost. Cultural relationships are often based on the presence or absence of certain artifacts that are temporally diagnostic (primarily projectile points and ceramics) but not necessarily culturally diagnostic. Based on the proliferation of cultural taxa within the Early Ceramic that has occurred over the past 50 or 60 years, it is no stretch to infer that few investigators working in Colorado archaeology have been very satisfied with the cultural frameworks constructed by their predecessors. Technology is often the first aspect of cultures to change, and as has been pointed out many times before, the adoption of what may be viewed as a superior technological innovation by a culture is not necessarily indicative of cultural identity with the contributing culture. Here is where the great problem lies in the archaeology of hunter-gatherer peoples: the barest residue, or most often the complete lack of evidence pertaining to the ritual and social aspects of these people, the superorganic part of culture. Burials offer one of the few conduits into these aspects of prehistoric cultures.

Most cultures possess a unique set of rituals associated with the treatment of the dead, and mortuary ritual was used to "express and intensify a network of social, political, and economic transactions" (Krause 1995:131). Burials, as artifacts of ritual, offer the clearest view of how prehistoric people thought about themselves as a social group and where their alliances and social identity were. This concept is apparent in the recognition of what has been called the Colorado Plains Woodland Mortuary complex (Breternitz and Wood 1965; Scott and Birkedal 1972). The following descriptions and discussion of burials are presented in greater detail than in previous overviews because of the importance of these data in future research regarding the cultural affiliation of Early Ceramic and Middle Ceramic period people in Colorado. As prehistoric people did not recognize the present political boundaries of Colorado, other western High Plains burial sites from outside the state that have been included in previous overviews (e g. Butler et al. 1986) have also been included. The locations of burial sites in the Platte River Basin are shown in Figure 6-5.

In past reports of burials in eastern Colorado, freshwater clamshells used in the manufacture of pendants have been assigned to the genus *Unio*. In his discussion of the Roberts Ranch burial, Black (1997b:11) states that according to Dr. Shi-Kuei Wu of the University of Colorado Museum, North American freshwater clams are more accurately assigned to the genus *Lampsilis*, among other genera, and that the genus *Unio* is restricted to Asian clams. In the following discussions, *Lampsilis* in parentheses follows *Unio* where it was used in the original report.

Plains

Michaud A Burial (5AH2). This site was a single, primary, flexed interment of a female aged 35-55 years, associated with an occupational zone on the first terrace of West Bijou Creek, approximately 16 km (10 mi) southwest of the town of Byers (J. J. Wood 1971, Wade 1971). Burial accompaniments were two large quartzite chopping tools, two unshaped hammerstones, five subrectangular handstones (one unifacially ground, two unifacially ground with one small facet on the opposite side, and two bifacially ground). Red ocher (hematite) was observed on one of the bifacial handstones, and limonite (yellow ocher) was observed on one of the unifacial handstones. A large, unifacially ground shallow-basin milling stone was placed over the head of the individual. Red ocher was observed on one edge of the milling stone. One large mammal (cf. *Bison bison*) humerus was placed on the milling stone, and the cannon bone of a deer or pronghorn was found in the pit fill. Both bones displayed cut marks. A radiocarbon age of 1800 ± 110 B.P., 2-sigma cal range 36 B.C.-A.D. 535 was returned from a sample taken from the lumbar vertebrae of the skeleton.

The burial pit originates at the base of stratigraphic Level 1, which represents the Early Ceramic component. Temporally diagnostic artifacts recovered from Level 1 in the vicinity of the burial include cord-impressed sherds from at least four conoidal vessels, with vertical to slightly outcurving rims and diagonal cord impressions. One small, corner-notched, arrow-sized projectile point was also recovered. If one accepts the association of the burial with this component and the radiocarbon age is accurate, this site represents the earliest examples of both the presence of ceramics and the use of the bow in eastern Colorado. However, it seems more reasonable to assume that the single-component "occupation level" represents occupations over a much longer period of time than presumed.

Aurora Burial (5AH244). The remains of two individuals were buried in one or possibly two superimposed burial pits on the first terrace of Toll Gate Creek, within the city limits of Aurora (Guthrie 1982). Burial 1 was a juvenile approximately five years old, either a secondary interment or disturbed; the bones were scattered vertically throughout 50 cm of the pit fill. Burial 2 was a primary, flexed interment of an adult male aged 35-39 years, buried 23 cm below the deepest of the bones belonging to the juvenile. Accompaniments associated with Burial 2 were a broken amazonite pendant, a broken atlatl weight, and one chert flake. Guthrie (1982) questions whether the juvenile represents the secondary burial of an individual that preceded the Burial 2 individual in death and was later exhumed and placed purposefully with Burial 2 during interment, or an older burial disturbed by the excavation of the pit for the adult interment. A sample of charcoal associated with Burial 1 returned a radiocarbon age of 1570 ± 95 B.P., 2-sigma cal range A.D. 256-660. A sample of charcoal associated with Burial 2 returned a radiocarbon age of 1040 ± 50 B.P., 2-sigma cal range A.D. 893-1153, and a sample of bone from Burial 2 returned an age of 1230 ± 80 B.P., 2-sigma cal range A.D. 656-990.

Beyers Burial (5AH740). This site is a single primary flexed interment of a female aged 17-20 years, buried on her right side and oriented south/north, possibly facing east. The burial was found associated with a Woodland camp. No accompaniments were reported (Morbeck 1966, referenced in Butler et al. 1986).

Hazeltine Heights Burial (5AM3). This site is situated on the east side of the South Platte River, on the first terrace above the flood plain, approximately 5.6 km (3.5 mi) southwest of Henderson

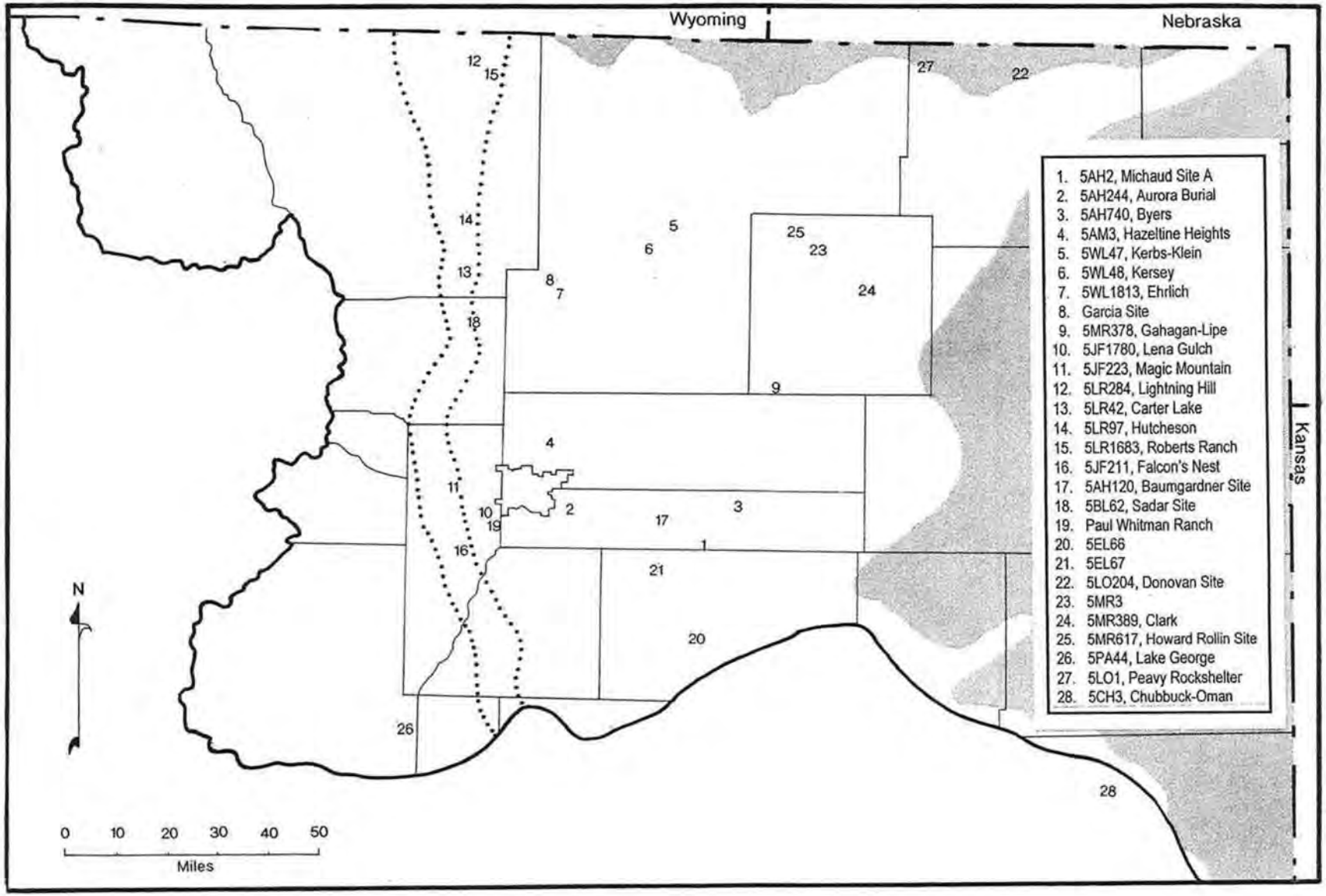

Figure 6-5. Distribution of Late Prehistoric Burials in the Platte River Basin.

(Buckles et al.1963). The site consists of seven separate primary interments uncovered during the mechanical excavation of a leach field in the backyard of a private home. Portions of all seven burials exposed in the trench walls were disturbed by heavy equipment. In addition to remains thought to be associated with the seven in situ individuals, the additional remains of between one and four adults and two infants were retrieved from the backdirt. Bone from Burial 6 returned a radiocarbon age of 1305 ± 100 B.P., 2-sigma cal range A.D. 566-971.

Burial 1 is an adult of indeterminate sex and age, buried in a flexed position without accompaniments. Burial 2 is a female, 30-33 years of age, buried in a flexed position with five *Olivella* shell beads, three of which were found above the skull and two within the oral cavity. The location of these beads in the oral cavity was interpreted as possibly the result of postdepositional processes. Burial 3 is the very fragmentary and incomplete skeleton of an individual of indeterminate age and sex buried in an unknown position. A relatively thick (0.5 cm.), asymmetrical, corner-notched biface classified as a projectile point or "hafted blade" was found halfway between Burials 3 and 4. Although Burial 3 was situated in proximity to Burials 4 and 6 within what appears is a single pit, other evidence suggests that the burials were sequential and not contemporaneous. Burial 4 is an adult of indeterminate age and sex buried in a flexed position. Other than an unidentified green pigment seen in the soil around the left shoulder, no other accompaniments were recovered. Burial 5 is the partial skeleton of an adult of indeterminate sex and possibly "advanced" age, buried in a flexed position with an unmodified cobble of granite. Burial 6 is the largely intact skeleton of an individual between 13 and 17 years old and of indeterminate sex, buried in a semiflexed, semirecumbant position. Accompaniments included a single bird humerus bead, 67 small mammal bone beads, three *Olivella* shell beads, and five *Unio* (cf. *Lampsilis*) shell pendants of various sizes and configurations. Four of the five had holes drilled at both ends for suspension, and one pendant was ovoid with one drilled suspension hole. Burial 7 is the complete but fragmented skeleton of an individual approximately 7 years old of indeterminate sex, buried in a recumbent, semiflexed position. Accompaniments include three bone beads made from the right humeri of three eagles, fragments of other beads made of bird bone, and one large ovoid *Unio* (cf. *Lampsilis*) shell pendant that had apparently been deliberately placed in the mouth of this individual at the time of burial. This pendant had a single, drilled suspension hole. Many artifacts recovered from the backdirt were thought to have been associated with the burials, including a ground stone pendant of hornblend-andicite porphyry, four *Unio* (cf. *Lampsilis*) pendants, three *Olivella* beads, 20 bone beads of various sizes, several complete and fragmentary handstones, a fragment of a milling stone, and a chipped stone blade fragment, and a utilized flake.

Kerbs-Klein Burial (5WL47). Six secondary burials were excavated from a small sand hill northeast of Greeley (Scott 1979). Two of the burials were removed by the landowner, and four more burials were excavated during subsequent test excavations. All of the interments that contained long bones were described as secondary bundle burials, and the descriptions of the presence of artifacts in the fill of the burial pits suggest that these associations may be inadvertent additions to the pit matrix from the surface scatter during burial instead of being purposefully placed with the individuals. Burial 1 was an adult of undetermined sex, buried in an irregular pit that also contained a quartzite flake and a burned mano fragment. Burial 2 contained very few fragments of bone and teeth (including an "immature" third maxillary molar), and had apparently been disturbed by plowing. One sandstone bead and one canid incisor were the only associated artifacts. Burial 3 was an individual of undetermined age and sex. Associated artifacts were an unmodified sandstone cobble and a quartz flake. Burial 4 was an individual of undetermined sex

with an age of 40 years or older. A quartzite ground stone fragment, the tip of a bone awl, and three flakes, one each of quartz, quartzite, and chalcedony, were found in the fill of the burial pit. The two remaining burials, designated Klein Burials 1 and 2 were a male and a female, both thought to be more than 40 years old. It is unknown if there were artifacts associated with these burials. A radiocarbon age of 1780+130,-150 B.P., 2-sigma cal range 36 B.C.-A.D. 554, is associated with bone from Burial 1.

Kersey Burial (5WL48). This site contains one secondary interment of an "immature human" near Kersey (Lutz 1974). The skull and ribcage minus the vertebral column were placed in a pit excavated below a Woodland occupational level. No artifacts were found in association with the burial.

Ehrlich Burial (5WL1813). Two secondary interments one meter apart were exposed in the terrace scarp of the Kuner terrace in an abandoned river channel of the South Platte River near Milliken (Brunswig and Wanner 1993). Burial 1 was an adult female aged 24-28 years old, oriented north/south. Burial 2 was an adult male between 21 and 23 years old and resembled a "flexed reclining figure whose overall arrangement suggests a seated figure facing north" (Brunswig and Wanner 1993:11). Both of these burials were thought to represent "secondary articulated burials," an intermediate type between primary burials and secondary bundle burials in which many of the bones were still loosely articulated and were recovered in anatomical position, very tightly flexed, while other skeletal elements were obviously not articulated and placed on top of the other body parts. Accompaniments recovered from Burial 1 were an oval quartzite scraper, two bone awls, and a bird bone spatulate tool with an angled bevel on one end. Bone from both skeletons was dated directly. Bone from Burial 1 returned radiocarbon age of 710 ± 60 B.P., 2-sigma cal range A.D. 1225-1398, which was rejected as too late. Charcoal from the burial pit and bone from Burial 2 were dated 2095 ± 60 B.P., 2-sigma cal range 350 B.C.-A.D. 53, for the charcoal and 1740 ± 60 B.P., 2-sigma cal range A.D. 139-428, for the bone. A flaked lithic and ground stone scatter was observed on the ground surface surrounding the burials, including the base of a corner-notched projectile point, which was thought to represent a Plains Woodland cultural affiliation.

Garcia Burial. This site was a possible ossuary near Milliken in Weld County (Anonymous 1961; cited in Eighmy 1984:83). Twenty-seven undeformed dolichocephalic skulls with shovel-shaped incisors were uncovered during excavation for a silo. Grave goods consisted of shell and bone beads, and *Unio* (cf. *Lampsilis*) shell pendants.

Gahagan-Lipe Burial (5MR378). Five primary interments of six individuals were excavated from an area of sand hills east of Muddy Creek, approximately 32 km (20 mi) southwest of Fort Morgan (Scott and Birkedal 1972). Two of the burials (3 and 5) were removed by local collectors and so limited information is available regarding position and orientation. Individual 1 was a female aged 45-55 years, buried without accompanying artifacts in a semiflexed position on her left side, oriented northwest/southeast and facing northeast. Individual 2 was a female aged 16-18 years, buried in a tightly flexed position on her stomach, with the head in an upright position oriented south/north and facing east. Individual 6 was the fragmentary remains of a postnatal infant aged seven to nine months, located in the abdominal region of Individual 2. The investigators hypothesized that the infant was buried in the lap of Individual 2. Accompaniments were an *Unio* (cf. *Lampsilis*) shell pendant recovered from under the mandible of Burial 2 and a bison astragalus. Individual 3 was an adult male buried in a flexed position. The only accompaniment was a unnotched projectile point or knife of white chert. Individual 4 was a male aged 18-20 years,

buried on his right side in a tightly flexed position, oriented north/south. Accompaniments were an oblong stone atlatl weight, a graver and a bird femur. The description of Individual 4 in Appendix I mentions that "a number of thick, massive, intrusive human skull fragments were found mixed in with the burial" (Scott and Birkedal 1972:13), without further comment on the apparent presence of a seventh individual as a secondary burial or any interpretation that might explain how or why these skull fragments found their way into this burial. Individual 5 was a child buried with six *Unio* (cf. *Lampsilis*) pendants. No other information is available for this burial. No absolute ages were associated with the site.

Hogbacks/Foothills

Lena Gulch Burial (5JF1780). This unique burial site was excavated by Colorado Department of Transportation archaeologists Dan Jepson and O D Hand in July 1998 (Jepson and Hand 1999). This site is situated on the boundary between the plains and hogback/foothills geographic areas, less than one mile south of the Magic Mountain site. Two burials were found in a backhoe excavation during a wetland mitigation project on the first terrace of Lena Gulch near the intersection of highway C-470 and Colfax Avenue. The upper of the two interments (Burial 1), a male between 35 and 45 years of age, was almost completely displaced by the backhoe before the burials were recognized, and so little is known about the position or orientation of this individual. The lower pit contained the tightly flexed, primary burial of a female in her middle to late thirties (Burial 2), buried on her right side, oriented south/north and facing east. Because of likely mixing of skeletal elements between the two individuals during construction, and coupled with the slightly ambiguous results of forensic analysis of the remains, sex determination is equivocal. The unique feature exhibited by both of these individuals is described as an anomaly of the first mandibular molar, a facet angled toward the lingual (interior) side of the teeth that is hypothesized as being the result of use wear due to an unknown activity. This apparent use wear is not exhibited on the other teeth. This sort of specific wear pattern is unusual and has not been previously documented in the literature (Dan Jepson, personal communication 1999).

Artifacts that accompanied the male included approximately 150 small (approximately 6 mm in diameter) disk beads manufactured from siltstone and a gilsonitelike substance. Gilsonite is a naturally occurring asphalt, a major source for which is in the Uinta Basin in northeastern Utah, or possibly northwestern Colorado; however, an isolated deposit does exist in Middle Park (Vanderwilt 1947). Gilsonite beads have been reported as occurring in low frequency in Uinta Basin Fremont sites (David Madsen, personal communication to O D Hand, 1998). Other artifacts associated with Burial 1 were several small, round bone beads, a large portion of a fragmented, conoidal ceramic jar with deep, parallel cord impressions that are perpendicular to the slightly flaring rim, a shell pendant, and a bifacially ground mano manufactured from a granite alluvial cobble. The vessel is thought to have been whole prior to disturbance of the burial by heavy equipment. Artifacts associated with the female included a short, in situ strand of 23 siltstone disk beads found near the cranium. These artifacts are identical to those found with the upper individual, and this, in addition to 13 disk beads recovered from the water screened sediments associated with the lower burial, seem to confirm a temporal and cultural relationship between the burials.

Additional decorative elements include three tubular bone beads, two of which are incised with 13 and 20 annular lines, respectively, 10 conical bone beads manufactured from mule deer phalanges, one shell pendant, and a bracelet of parallel rabbit incisors that may have been woven

together or mounted on a backing. The incisors were found in situ on the wrist of Burial 2. A similar association in a burial context was recorded at Woodruff Ossuary, where unmodified rabbit incisors were found scattered around Feature 16, the partially articulated skeleton of an adult male (Kivett 1953:121).

Just as interesting as these decorative elements is the presence, 25 cm above Burial 2, of what is apparently the contents of a bag or pouch that contained the tool kit and works in progress of that individual. All evidence of the container has disappeared, leaving a varied concentration of five large (7-10 cm in diameter) bifaces, three of Dawson Formation petrified wood and two possibly of Kremmling chert; one corner-notched knife of petrified wood; nine small, corner-notched projectile points and other hafted bifaces of Kremmling chert and petrified wood, some with serrated blade edges; two end scrapers; five modified and 25 unmodified flakes, fragments of antler, possibly a billet; one bone awl; one fragment of worked bone thought to have been an awl or flaker; and four pieces of unmodified malachite, possibly used as pigment. In addition, nine modified mule deer phalanges, representing all stages in the manufacturing sequence of the same conical beads that were part of this individual's personal ornamentation, were included in the assemblage. Artifacts similar to these found in burial contexts were recovered from the backdirt at the Hazeltine Heights site (Buckles et al. 1963:24, Plate 8 I), and from Burial 1 at Magic Mountain (Irwin-Williams and Irwin 1966:157, Figure 45, top row left-MM 132).

One unmodified piece of bivalve shell was found below the burials at the base of the cutbank and is thought to be associated with one or the other. Analysis of charcoal samples collected from the pit of Burial 1 returned a radiocarbon age of 1310 ± 40 B.P., 2-sigma cal range A.D. 656-787, and charcoal from the pit fill of Burial 2 returned an AMS radiocarbon age of 1430 ± 50 B.P., 2-sigma cal range A.D. 547-678. The amount and variety of accompaniments found with these two burials make them unique for the Early Ceramic period in eastern Colorado.

Magic Mountain Burials (5JF223. Three burials were reported in the original Magic Mountain report (Irwin-Williams and Irwin 1966). Burial 1 was given a Woodland affiliation and Burial 2 was given a Zone B cultural affiliation. Subsequent work at the site established that Zone B was not aceramic as was thought by the Harvard investigators, and did contain Early Ceramic period material culture (Kalasz and Shields 1997:320). Burial 1 contained two individuals interred in a bell-shaped pit that was uncovered in a backhoe trench excavated for a water pipeline. The first individual was placed facing south in a vertical seated position with tightly flexed legs. The remains of the second individual were too disturbed during excavation of the trench to determine position and orientation of the body. The only accompaniments to this burial were two bone beads, one of which is in the shape of a truncated cone and is similar to the deer phalanx bone beads from the Lena Gulch burials (above). Two end scrapers that may have been inadvertently included when the pit was filled were also recovered from Burial 1. No information on the age and sex of any of the burials excavated by the Harvard investigators is available. The description of Burial 2 states that the body was placed in a tightly flexed position on the left side, oriented southwest. However, the photograph of the burial shows the body on its right side (Irwin-Williams and Irwin 1966:50). The skull was apparently forced into an upright position so that the body fit into the pit, causing the fracture of two cervical vertebrae. Accompaniments consisted of six *Olivella* shells "drilled for suspension." Five of these beads were found within the chest cavity, and the sixth between the first and second ribs on the right side, suggesting they were worn as a necklace when the body was interred.

Some very general information regarding other burials from the Magic Mountain site that were excavated by amateur excavators Jack Putnam and Robert Ackerly prior to the Harvard investigations is included in the synthetic section for the Woodland occupations (Irwin-Williams and Irwin 1966:209). Apparently, several burials were excavated and burial position within shallow graves is either extended and face up or flexed and on one or the other side. Burial accompaniments range from utilitarian or simple decoration such as bone beads, awls and stone tools, to "exotic," such as *Unio* (cf. *Lampsilis*) shell ornaments, or the skull of a bighorn sheep, perforated for use as a headdress.

Two fragmentary burials were identified during the 1994 and 1996 field seasons at Magic Mountain (Kalasz and Shields 1997). Although the remains are fragmentary and many bones were widely scattered, there were enough in situ remains from the lower extremities of the first individual (Feature 17) to hypothesize a primary interment of a gracile male aged 35-45 years, buried in a kneeling position with the torso assumed to be vertical. Orientation of the head was thought to be east-southeast. No accompanying grave goods were recovered. The burial was recovered from a Zone B stratigraphic context with bracket ages of 1620 ± 60 B.P., 2-sigma cal range A.D. 263-597 to 1220 ± 70 B.P., 2-sigma cal range A.D. 664-985. The bones of the upper body were hypothesized to have been disturbed by an erosional event that occurred after 1220 B.P. The presence of a second individual is minimally represented by two mandibular teeth, with age estimated from tooth wear between 35 and 67 years.

Lightning Hill Burials (5LR284). This multicomponent open campsite near Livermore in Larimer County contained two burials, one primary flexed and one secondary (Morris and Marcotte 1976b; 1977; Morris and Mayo 1979; Morris et al. 1984). The primary burial was of an adult male with head oriented to the north; no information on position of the body was given. Accompaniments included two large shell pendants and "dozens" of bird bone beads. A secondary interment of an adult male buried without accompaniments was also discovered. The secondary burial was missing the cranium, mandible, atlas, and axis. It was unknown if this individual was buried purposefully without a head or if the cranium, mandible and upper vertebrae were removed through erosion from the top of the pit. Although none of the radiocarbon ages from this site listed in the OAHP database are designated as being associated with these burials, in a personal communication cited in Scott (1979:22), Elizabeth Morris believes the Early Ceramic component dates to "about A.D. 300." This is consistent with what must have been the radiocarbon ages returned from samples collected during the first season, 1580 ± 110 B.P., 2-sigma cal range A.D. 239-666 for Feature 20, and 1635 ± 160 B.P., 2-sigma cal range A.D. 69-683 for Feature 3.

Carter Lake Burial (5LR42). This is a single primary interment of a female aged 45-55 years, tightly flexed on her left side, oriented east-northeast with the head facing southeast (Gleichman and Mutaw 1994). At least two large sandstone slabs were placed over the body after it was placed in the pit. No nonperishable funerary offerings accompanied the burial. The burial is located on a terrace remnant above a tributary drainage to Dry Creek, 16 km (10 mi) north of Lyons. The burial pit was excavated through a midden deposit, which was used to cover the body after it was placed in the pit. A sample of charcoal from this deposit above the burial pit returned a radiocarbon age of 1650 ± 90 B.P., 2-sigma cal range A.D. 179-635, and a sample of charcoal from the midden deposits in the burial pit returned an age of 1850 ± 90 B.P., 2-sigma cal range 32 B.C.-A.D. 407. The difference between these ages was determined not statistically significant.

Hutcheson Burial (5LR97). Three primary interments in three separate superimposed burial pits were uncovered by a backhoe on the second terrace of Buckhorn Creek, west of Fort Collins (Wade 1966). All three of the burials were somewhat disturbed during trenching. The context of Burial 2 was almost completely destroyed; this burial consisted of a fragmented cranium recovered from the backdirt and small fragments of bone remaining in situ in the trench. Burial 2 was in an intermediate position between the lower Burial 1 and the upper Burial 3. Bones from all three burials were found in the backdirt, but these were too fragmentary and mixed to attribute to any one individual. Burial 1 was a female, aged 35-40 years, buried in a flexed position on her left side oriented north/south. Accompaniments consisted of 93 undecorated, tubular bone beads and numerous bead fragments, nine of which were manufactured from bird humeri, the rest from small mammal bones. Burial 2 was a male, 30-35 years old, and as mentioned above the burial was almost completely disturbed, so there was no information about position and orientation of the body or any associated artifacts. Burial 3 was a female aged 45-50 years, buried in a flexed position on her right side, oriented east/west, possibly facing north. Accompaniments consisted of two small tubular mammal bone beads similar to those placed with Burial 1. Forty-two bone beads were recovered from the backdirt. Thirty-three of these were manufactured from small mammal bones and nine were bird humeri. These beads were identical to those found with Burial 1, and were hypothesized to have been associated with Burial 2 and/or Burial 3. The nondiagnostic midsection of a gray chert projectile point recovered from the backdirt was the only other artifact recovered from the site. A radiocarbon age of 1805 ± 105 B.P., 2-sigma cal range A.D. 1-443 was returned from a sample of bone from the right humerus and femur of Burial 3.

Roberts Ranch Burial (5LR1683). This single primary burial is of a female aged 50+ years, placed in an unlined oval pit in a flexed position on her right side, almost reclining (Black 1997b). Orientation was to the southeast, with the head facing forward with the chin on the chest. Two grinding slabs had been placed on top of the body, and a *Lampsilis radiata siliquoidea* shell pendant with two drilled suspension holes was found below the skull. At least 88 shell disk beads and 235 tubular bone beads were also found in association. Although too highly modified to identify, the shell disk beads might have been manufactured from a marine species. Based on the patterned location of beads of different sizes, investigators suggested that three separate beaded items were represented: an elaborate necklace of shell disk beads and large, tubular bone beads that may have incorporated the shell pendant, a robe or shirt or other body covering that was decorated with masses of small to medium size bone beads, and a pouch, pocket, or legging decoration that incorporated tiny bone beads. During analysis of the skeleton, additional beads and a pendant from a multistrand necklace were recovered from the oral cavity. The shell pendant is oblong with two suspension holes and is manufactured from a shell of unknown origin. Additional beads from the oral cavity include 22 shell disk beads (five of which are incised), five *Olivella* shell beads, and a cluster of at least 36 perforated juniper seed beads. This was thought to represent the first occurrence of juniper seed beads outside the Southwest culture area (Black 1997b:11). Charcoal collected from the burial pit and thought to represent a fire built above the pit as part of the interment ritual returned a radiocarbon age of 1520 ± 110 B.P., 2-sigma cal range A.D. 260-690.

Falcon's Nest Burials (5JF211). Two burials were associated with this site (Finnegan 1997, Adkins 1993). Feature 16 was the primary interment of a male aged 50-60 years in a flexed position on his back, oriented southeast/northwest and facing northeast. An unmodified piece of sandstone was the only accompaniment. Feature 23 is the primary interment of a female aged 35-45 years with an infant aged four to six months. The female was semiflexed on her left side,

oriented to the north facing east. No information on the position or orientation of the infant is available. Both individuals were placed in a pit that had an incomplete ring of cobbles placed around the bottom. A large metate that covered the head of the female was the only accompaniment. A piece of charcoal recovered from the sediment within the cranium of the Feature 16 individual returned an age of 1990 ± 240 B.P., 2-sigma cal range 753 B.C.-A.D. 591. Bone from the femur of the Feature 23 female returned a radiocarbon age of 1100 ± 60 B.P., 2-sigma cal range A.D. 789-1029. These two burials were located 2.75 m apart, and both were stratigraphically associated with each other. Despite the small standard deviation associated with the age from Feature 23 (and because bone from the skeleton was used to directly date this individual), and the large standard deviation and more indeterminate original context of the charcoal from the Feature 16 cranium, the age from Feature 23 was rejected as too recent and therefore probably contaminated. As a result, both burials were given a Late Archaic association (Adkins 1993 II:4-5). The information is included in this section as well as in the section containing the Late Archaic site descriptions because an Early Ceramic association for Feature 23 is an alternative interpretation that should be considered given the information above.

Early Ceramic Burials Without Reports

The following descriptions are for burials or sites with human remains within the Platte River Basin that were given a Woodland or Ceramic affiliation or some variation of the latter (for what ever reasons) by the recorder. There are no primary report references or other information available for these sites other than the site form on file at the OAHP. This list is derived from that found in Kalasz and Shields (1997:197-198). All but one of the burials were located in the plains subarea (the Lake George Burial is in the mountains subarea).

Baumgardner Site (5AH120). Recorded in 1986, this burial consists of one human mandible that had eroded from a Woodland cultural level containing hearths, lithic artifacts, and pottery, exposed in a cutbank of Kiowa Creek. Based on tooth eruption, the individual was aged 19-20 years.

Sadar Burials (5BL62). These burials were completely disturbed when an agricultural field 2.4 km (1.5 mi) southeast of Hygiene was leveled and cultivated in 1966. Scattered, fragmentary human remains consisting of poorly preserved infant and adult bone and teeth fragments were all that was left of the two or more individuals buried in the field. Accompaniments included one triangular stemmed basal-notched projectile point and 380+ *Unio* (cf. *Lampsilis*) disk beads. A Woodland cultural affiliation was made based on the presence of the shell disk beads. According to the site form, prior to leveling and cultivation of the field, a low earthen mound 4.5 m (15 ft) in diameter and 28 cm (11 inches) high covered the burials. Although not explicitly stated, the site form implies that the mound was a constructed feature.

Paul Whitman Ranch Burials. The description of this site is based on a personal communication from H. C. Morton, who was cited in the first Magic Mountain report (Irwin-Williams and Irwin 1966:211). The site is located approximately 14 km (9 mi) west of Denver on Morrison Road and was described as a long, narrow hill (ca. 5.5 x 183 m [18 ft x 600 ft) that was removed during land-clearing operations in 1927. A large amount of human bone was uncovered, as well as shell and bone beads, shell bracelets, cord-marked ceramics, and projectile points, which were all gathered by local collectors. According to Irwin-Williams and Irwin (1966), there was some question of whether this linear "hillock" was a natural feature or an artificial mound in which the human remains were buried.

Site 5EL66 (L:11:20). This site, given a "Woodland" cultural affiliation, is a campsite and burial on the crest of a hill overlooking the valley of West Bijou Creek, southeast of Kiowa. Cord-marked pottery, flakes, shell, a human tooth, and human bone were found on the surface around a small rock pile on the east side of the hilltop. Another small rock pile was observed on the west side of the hilltop, but was not investigated. A fragmentary skeleton with a fragmentary cord-marked pot were excavated from the site in 1953 by University of Denver students supervised by Arnold Withers, but no report from these investigations exists.

The collection from this site was cursorily examined at DU for this report. The human remains consisted of the atlas, five cervical vertebrae, one thoracic vertebra, two rib fragments, an ulna or radius shaft fragment, one third molar, and five unidentifiable fragments. The right temporal, front half of the mandible, and one thoracic vertebra were sent to a lab for analysis and radiocarbon dating and were subsequently lost. This individual was an adult at time of death, but it was impossible to determine the sex. The partial vessel excavated with the burial is very deeply marked with a paddle wrapped with relatively coarse cordage, the cord marks are subparallel and oblique to the vertical rim. The cord marks are completely obliterated 0.5 to 1.0 cm down from the rim. The vessel appears to be large; a 10 to 12 cm wide reconstructed section of the rim showed little curvature and suggested a very rough estimate of the opening to be 25-35 cm in diameter. A mano fragment, several metate fragments, a two pieces of shell, two fragments of triangular projectile points, 16 flakes, and nine rocks were also in the collection. The entire collection from the site was curated with the human remains, and it is not known whether these materials were all associated with the burial or if some of it represents general site collection.

Site 5EL67 (L:11:21). This site is situated on a grassy slope north of a small tributary of Kiowa Creek. The campsite was given a possible "Parker focus" designation when recorded by DU in 1954. North of the campsite are two areas from which the landowner excavated burials. In one area three burials were excavated, and in another area the landowner reportedly found fragments of five skeletons in one pit measuring 18 inches in diameter and 18" inches deep, suggesting secondary interments. There was no mention of any burial accompaniments. A small corner-notched point and a cord-marked sherd collected from the site and curated at DU are assumed to be from the general site collection.

Donovan Site (5LO204). Recorded in 1982, this is a Woodland campsite situated in what was called on the site form "pinyon-juniper scrubland" in the area of broken topography mapped as Lewis Canyons. Cultural material included charcoal lenses, sherds, projectile points and other lithic tools, bone and human remains eroding from the cutbank of a tributary of Lewis Creek. The site is located approximately 8 km (5 mi) southwest of the town of Peetz, which is 5 km (3 mi) south of the Nebraska state line. Brunswig (1996) reports that a burial at this site has been given an Upper Republican affiliation by by the University of Wyoming researchers, but excavation results are not yet available. No other details are provided.

Site 5MR3. This site is situated on a high plateau overlooking the valley of Wildcat Creek, 16 km (10 mi) northwest of Fort Morgan. The site is a lithic scatter approximately 450 x 270 m (500 x 300 yd), with a small area 45 x 23 m (50 x 25 yd) next to the edge of the bluff where two or three hearths and at least 16 burials were excavated by collectors prior to recording of the site in 1950. Most of the information contained in the site form was reported secondhand to R. L. Shalkop of the River Basin Survey by the individuals who collected the site. The first burial was discovered under a horizontal sandstone slab at the bottom of a hearth. The skeletons were reported to have

been placed in individual pits 0.6 to 1.2 m (2 to 4 ft) deep, in a flexed, sitting position. All interments were single, except for one pit that contained the remains of at least four individuals, one of which may have been a cremation. Accompaniments included one flat oval knife of light brown quartzite, many birdbone beads around the necks of the individuals, unworked clamshells, and a few polished bone artifacts that were thought to be hair ornaments. In addition, one turtle carapace was placed in each grave. Each intact mandible was missing three "lower medial incisors" apparently removed postmortem since no healing of the bone was observed. Personnel at the Denver Museum of Natural History examined some of the skeletons, and found them to be "representative of 'Forest People,' probably about 700 years old." Each interment was covered with a single sandstone slab, or in a few cases by two small slabs placed vertically in the ground 0.3 to 0.6 (1 to 2 ft) apart. No pottery was found on the site surface or in any of the burials, so the determination of a "Woodland" affiliation given to the site by the OAHP may have relied on the DMNH evaluation of the skeletal material. One of the informants stated that the majority of projectile points found in the vicinity around the site were small, triangular side-notched forms.

Clark Site (5MR389). This site is situated on a terrace overlooking the South Platte River. The amount of information included on the site form is small, and details are unclear. All that can be determined is that eight burials were excavated on this site in 1978 by two students at the UNC who, according to the site form, were participating in an independent study. The list of cultural material recovered from the site includes a small, corner-notched projectile point, a McKean point, and "McKean knife," and a shell bead. It could not be determined from the site form if the cultural material was recovered from the burial excavations or from the site surface. The site was given an "Archaic and later" cultural affiliation by the recorders.

Howard Rollin Burials (5MR617). This site is located on Wildcat Creek north of Weldona, in northern Morgan County. At least three flexed interments were excavated by the landowner. Burial accompaniments included *Unio* (cf. *Lampsilis*) pendants and bone beads (Breternitz and Wood 1965). A site form was not available.

Lake George Burial (5PA44). This site is 4 km (2.5 mi) northwest of Lake George on the first terrace of the east bank of the South Platte River. The burial was found in 1973 and excavated by a collector who subsequently turned over the remains, accompaniments and notes and drawings to the Forest Service. No information is included in the site report regarding the position and orientation of the body. The accompaniments included three large projectile points, one small serrated point, and one ovoid bifacial knife. No mention was made of ceramics, either with the burial or in the surface scatter on the tread of the terrace above the burial. This site may have been given a "Woodland" cultural affiliation based on the presence of the small, serrated projectile point.

Important Early Ceramic Burial Sites Outside Colorado (Kansas and Nebraska)

The following burial sites from the Central Plains outside Colorado have been cited for comparative purposes in several discussions of Plains Woodland burial practices and indicate how Early Ceramic burials in Colorado may be related to the greater Plains Woodland pattern.

Woodruff Ossuary, Kansas (14PH4). The site is perhaps the best known and completely reported of the known Plains Woodland ossuaries (Kivett 1953). The ossuary occupied a large oval basin measuring 7.6 x 6.1 m (25 x 20 ft) in size, excavated to a maximum depth of 1.8 m (6 ft) into the

sediments of a terrace above Prairie Dog Creek, 90 m (100 yd) south of the Nebraska state line (Kivett 1953). The large basin contained 14 intrusive pits, and the contents of both basin and pits included charcoal-darkened sediments, burned wood, the disarticulated remains of at least 61 individuals, thousands of shell disk beads and bead blanks in all stages of manufacture, bilaterally drilled triangular and crescentic shell pendants, tubular bone beads, and a small number of other bone, antler, chipped stone, ceramic and ground stone artifacts. Many of the human bones were broken, and some were burned, as were many shell and bone artifacts. The disk beads and some pendants were manufactured from freshwater mussel species, but some of the other beads were manufactured from the marine species *Busycon contrarium,* and *Olivella* sp., cf. *O. nivea.* The source for most of the exotic shell was thought to be to the southeast via the Mississippi drainage. With the exception of Feature 21, a primary burial, all of the burials were secondary, the bones scattered with no evidence of bundle burials. Some isolated instances of articulation between lower arm and hand bones, and lower leg and foot bones were observed. The skeleton of Feature 21 was that of an adolescent, semiflexed on the left side, oriented south/north and facing west. No information regarding the sex of this individual was provided. Accompaniments included many strands of finished shell disk beads and shell bead blanks that covered the pelvis and extended up the chest and around the neck. Feature 16 was a partially articulated adult skeleton that was buried with shell beads within or very close to the oral cavity and a shell pendant blank just in front of the oral cavity (Kivett 1953:Plate 18). This feature also had a large number of unmodified rabbit teeth scattered around it (Kivett 1953:121). These teeth could have been part of a bracelet or other ornament similar to that found with the lower individual at Lena Gulch (Jepson and Hand 1999). Charcoal from the fill of the ossuary pit returned a radiocarbon age of 1350 ± 240 B.P., 2-sigma cal range A.D. 222-1198 (Wedel and Kivett 1956).

Bisterfeldt Burial Site, Nebraska. This undated site was located one half mile east of the town of Scottsbluff, when it was recorded in 1941. The report of the investigations was not published until much later (Mattes 1965, Breternitz and Wood 1965). Four burial pits containing the remains of 32 adults and five infants was exposed during the excavation of a potato cellar. Many of the skeletons were disarticulated and fragments of several were charred. Pit 1 was 2.4 x 1.1 x 1.5 m deep (8 x 3.5 x 5 ft), and contained fragments of two charred skeletons, disarticulated parts of four adults, and the flexed, seated primary interment of an adult facing east. Two bilaterally drilled shell pendants and one possible *Olivella* shell bead were the accompaniments of the primary interment. Pit 2 was 2.7 x 1.5 x 0.9-2.1 m deep (5 x 5 x 3-7 ft), and contained the remains of 16 adults, three infants and the flexed primary interment of an adult in a collapsed sitting position, pelvis to the north, head to the south, that was found on the east margin of the pit. It was hypothesized that the original vertical position of the seated individual was disturbed when the excavation of Pit 2 intruded into the west side of the smaller burial pit, causing him to collapse forward, with the right shoulder down (Mattes 1965:Figure 4). One shell pendant was found near the sternum of the primary burial, and a corner-notched dart point and an atlatl weight were found in the fill of Pit 2. Pit 3 was 1.8 x 1.4 x 1.2-2.1 m deep (6 x 4.5 x 4-7 ft), and contained the remains of eight adults and one infant. A lithic scraper and a bone awl were the only accompaniments. Pit 4 was 1.5 m (5 ft) deep and contained the remains of an infant that was disturbed by a scraper blade during excavation of the cellar. The burial was apparently "wrapped" in strands of tubular bone beads; at least 110 beads are pictured with the human remains (Mattes 1965:Figure 5). More than 700 tubular bone beads were recovered from all of the infant burials. Except for the three burials described above, the other remains were deposited "without particular care" (Mattes 1965:60), suggesting the lack of bundle burials, but not confirming it. Although no mound over the burials is described, and the artifactual material recovered was described as

"similar to that found throughout the state," the Bisterfeldt site is referred to as "this mound burial" in the final paragraph, and the site was thought to have "affinities with cultures normally confined to eastern Nebraska" (Mattes 1965:61). In addition to the dart point and atlatl weight from Pit 2, two other dart points were recovered from the general cellar excavation. These artifacts suggest a date of pre-A.D. 500 for the site.

Young Site, Kansas. This undated site, located south of the Smoky Hill River in Scott County, consists of the primary interment of five individuals (Wedel 1959, cited in Butler et al. 1986). Burial 1 was an adult female flexed on her right side, head to the south and facing east. Accompaniments were red ocher, turtle shell and two mussel shells. Burial 2 was an infant; position was not available, but orientation is northeast/southwest, and the head is to the northeast. Sex could not be determined. Accompaniments were canid toe bones, mussel shell pendants, and 30 tubular bone beads. Burial 3 was possibly an adult female flexed on her back, oriented northeast/southwest and facing southeast. Accompaniments were a worked turtle carapace, 50-60 tubular bone beads, a bone awl, a stemmed point, seven scrapers, perforated mussel shell, and three preforms/blanks. Burial 4 was an infant of indeterminant body position, oriented northeast/southwest. Accompaniments were one unmodified mussel shell, and one perforated mussel shell. Burial 5 was an adult female flexed on her left side, oriented northeast/southwest and facing southeast. Accompaniments were a knife, a scraper, and a flanged drill. This burial was covered in elaborate alternating layers of rock and sand.

Massacre Canyon Site (25HK13). This site, located north of the Republican River in Hitchcock County, southwestern Nebraska, consists of seven burials, of which five were primary flexed burials, one was a secondary burial that was partially cremated, and one consisted of scattered remains (Kivett 1952; Wedel 1986). Burial 1 was an adult male flexed on his left side, oriented northeast/southwest and facing northeast. Accompaniments were four chipped stone scrapers, one shell disk bead, two pieces of limonite, one piece of limestone, and one quartzite flake. Many of the accompaniments were found in a concentration under the right femur that suggested deposition with the burial in a perishable pouch or container. Burial 2 was an adult male flexed on his right side, oriented southwest/northeast, facing east. There were no nonperishable accompaniments, although a soil stain under the skeleton may be the remnants of a robe or other perishable material that had lined the pit. Burial 3 was a young adult female flexed on her back, oriented northeast/southwest and facing west. There were no nonperishable accompaniments, but soil discoloration suggested perishable materials were interred with this individual. Burial 4 was a child of indeterminate sex flexed on the right side, oriented northeast/southwest and facing west. Accompaniments were a string of 75 shell disk beads placed around the neck. Burial 5 was a secondary burial. A portion of the skeleton was placed in the bottom of a pit, and the orientation of some of the bones suggested that some of them were still articulated. A culturally sterile layer of yellow clay covered these bones, and the charred mandible, rib fragments, and portions of the lower legs were scattered throughout the upper 0.4 m (1.2 ft) of the pit fill along with large pieces of charcoal; apparently, a fire was built among the bones on top of the sediments that sealed off the lower part of the pit. The cranium was placed on its right side facing northeast on a small bench excavated into the side of the pit between the unburned remains below and the burned remains above. There were no accompaniments. Burial 6 was a child of indeterminate sex flexed on the right side, oriented southwest/northeast and facing east-northeast. Accompaniments were 20 well-made, large shell disk beads, and 21 tubular bird bone beads, 19 of which were incised with annular or spiral designs; fragments of mussel shell that were found among the bones may have been intentionally placed with the burial. Burial 7 is the disarticulated and scattered remains of a

small child of indeterminate sex. The skeleton of this individual was thought to have been disturbed by rodent activity. A piece of shell from this site returned a radiocarbon age of 2080 ± 250 B.P., 2-sigma cal range 793 B.C.-A.D. 532 (Wedel 1986).

Sioux County Burial, Nebraska. This burial is a primary interment of an adult male approximately 50 years old, in an extended position on his back, oriented west/east and facing north (Gill and Lewis 1977). The burial is situated on a hill within an area of extensive badlands in northwestern Nebraska, not far from the Wyoming state line. The fill of the long, narrow pit above the body contained ashes and charred stone, three unmodified flakes, one worked flake, a mano, and a large broken ceramic vessel directly above the thoracic area of the skeleton. This vessel is described as elliptical in configuration, measuring 53 cm in height, 36 cm wide at its maximum diameter and 27.5 cm across the incurving rim. The exterior surface is diagonally cord or brush marked, as is the upper 7 cm of the interior. Based on metric data, the skeleton shows genetic affinity to culturally nonrelated populations to the west in Wyoming, rather than to Woodland populations in northern Kansas and Missouri. Charcoal recovered from the burial pit fill returned an age of 750 ± 90 B.P., 2-sigma cal range A.D. 1051-1403.

Evidence of Early Ceramic Horticulture

At present there is meager evidence in support of prehistoric horticulture in the Platte River Basin. The presence of macrobotanical corn or corn pollen in a handful of Early Ceramic components and one Middle Ceramic component is the only evidence of cultigens in prehistoric contexts. The distribution of these sites is found in Figure 6-6.

Plains

Three O'Clock Shelter (5WL1997). Two fragmented kernels of Chapalote maize were recovered from Feature 6, a small ovoid trash midden located within the lean-to structure in stratigraphic Unit 7 (Brunswig 1996). Two radiocarbon ages are associated with Unit 7, 1420 ± 60 B.P., 2-sigma cal range A.D. 539-762, and 1510 ± 70 B.P., 2-sigma cal range A.D. 414-662.

Lehman Cave (5EL12). One small charred corncob, 3 cm long and 2 cm in diameter was removed by collectors during excavations in this rockshelter (Lyons and Johnson 1994). The cave and associated midden contained Archaic, Woodland, and Late Ceramic Great Bend and Dismal River components. Because the corn was recovered during undocumented excavations, it was impossible to determine which component the corn was associated with.

Hogbacks/Foothills

LoDaisKa Site (5JF142). Macrobotanical remains of corn, consisting of cobs and kernels, and also possible *Zea mays* pollen were found and associated with three of the four cultural complexes (Irwin and Irwin 1959; 1961). Fragments from three corncobs and possible *Zea mays* pollen were recovered from Complex D, between 75 and 82 inches below datum. These corncobs were of a "morphologically primitive" type, with 14 rows and medium-sized kernels that resembled Chapalote corn from Mexico. Cultural material associated with Complex D was found between 135 and 264 cm (53 -104 inches) below datum, but material from this culture "in its purest form" was found between 183 and 264 cm (72-104 inches) below datum (Irwin and Irwin 1959:12).

Complex D, with associated bracket radiocarbon ages of 4840 ± 250 B.P. and 3150 ± 200 B.P., 2-sigma cal range 4222-834 B.C., was thought to represent the Archaic Desert culture (Irwin and Irwin 1961). Macrofloral remains of corn associated with Complex B consisted of one fragment of a small, 16-row cob with very small kernels, recovered from a depth of 135-145 cm (53 -57 inches) below datum. Cultural material associated with Complex B was found between 76 and 135 cm (30 and 53 in) below datum. Complex B was thought to represent a variation of the Plains Woodland Culture, with associated bracket radiocarbon ages of 1260 ± 150 B.P. to 970 ± 150 B.P., 2-sigma cal range A.D. 537-1298. This corn was thought to be a form of popcorn and "more evolved" than the corn from Complex D. A single kernel of Dent corn associated with Complex A was recovered between 56 and 66 cm (22 and 26 inches) below datum. Cultural material associated with Complex A occurs between the surface (between 51 and 61 cm [20-24 inches] below datum) and 122 cm (48 inches) below datum, was interpreted as a variation of the Fremont Culture of Utah and western Colorado. This occupation was thought to have occurred after 970 ± 150 B.P., 2-sigma cal range A.D. 694-1298. Dent corn is characteristic of Fremont sites in Utah (Wormington 1955). Despite the relatively great stratigraphic overlap between the different cultural complexes, and the stratigraphic inversions of several of the radiocarbon ages, Irwin and Irwin (1961) are relatively confident in their interpretations of associations between material culture and macrobotanical remains with the different cultural complexes. However, because of this overlap between complexes, and considering the level of disturbance usually encountered in rockshelters, not to mention what is known of the antiquity of corn in other archaeological sites north of Mesoamerica, a more cautious interpretation of cultural associations is warranted. The presence of corn in a Middle Archaic stratigraphic context at a site in the hogbacks/foothills subarea of Colorado should be viewed with healthy and appropriate scepticism.

Willow Springs and Big Morrison I Rockshelters. Two single component rockshelter sites with a "Woodland" cultural affiliation in the Morrison area, Willow Springs and Big Morrison I contained dent corn (Irwin and Irwin n.d., referenced in Irwin and Irwin [1959] and Irwin-Williams and Irwin [1966:210]). Brief references in the LoDaisKa and Magic Mountain monographs is all the information that seems to exist for these sites. Perhaps somewhere the excavated materials and notes are stored and await discovery, but until that occurs details of these sites remain a mystery.

Site 5DA90 (K:8:51). Little information is available from this excavated open campsite at Chatfield Reservoir (Nelson 1979). Two kernels of corn were recovered from the subsurface along with a metate fragment, knives, scrapers and gravers. A fragment of a corner-notched projectile point/knife was recovered from the surface of the site. No radiocarbon ages or temporally diagnostic artifacts were associated with the corn. Even though this is an open site, the corn was thought to be associated with the prehistoric occupation and was not a result of contamination.

Bradford House II (5JF51). Discussion of the remains of domesticated species at this site and the following three sites is included to enumerate the ongoing discussion of all of the available evidence of prehistoric horticulture. All of the examples below have been rejected as prehistoric cultigens by the investigators, and are thought to be the result of contamination of the deposits by corn and sunflower seeds in the feed of cattle that historically have sheltered under the overhangs at the sites, and possibly by rodents transporting seeds to the site from modern gardens in the area.

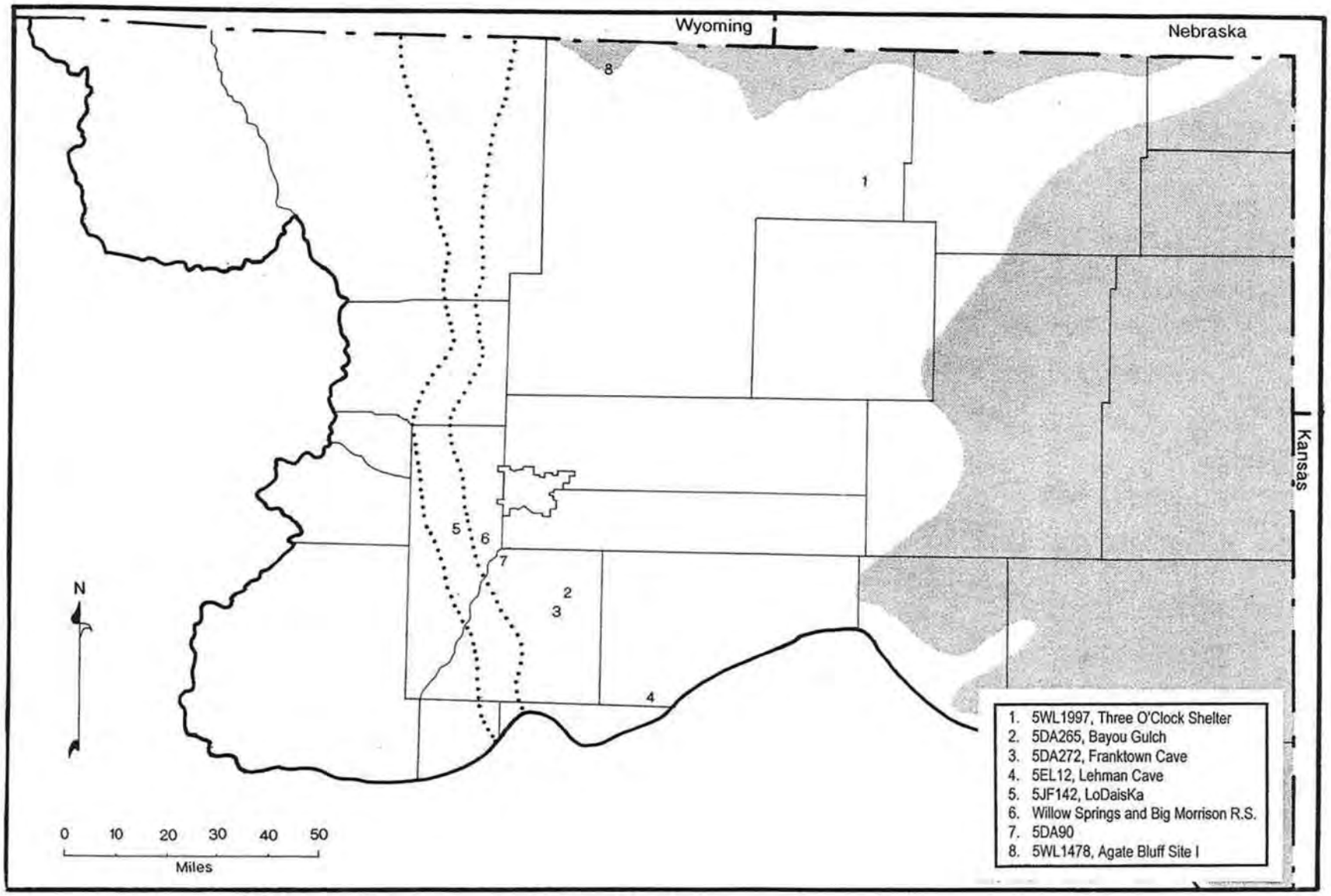

Figure 6-6. Distribution of Late Prehistoric components that contain evidence of corn.

Four kernels of corn were found in "overburden" (depth unspecified) near the surface of the sediments at Bradford House II, and two sunflower seeds were found between 0 and 10 cm (0 and 4 inches) below ground surface (Johnson and Lyons 1997a; Johnson et al. 1997). None of these seeds were charred, and their presence close to the surface in what were designated Historic cultural stratum, was thought to represent material brought to the site as cattle feed.

Bradford House III (5JF52). Uncharred squash seeds were found at several levels, but appear not to be prehistoric in origin (Johnson and Lyons 1997b; Johnson et al. 1997). The presence of these seeds at various depths in apparently different natural/cultural stratigraphic contexts was interpreted as the result of modern contamination owing to rodent activity and not to prehistoric horticulture.

Crescent Site (5JF148). Seven pollen samples contained *Zea mays* pollen (Cummings and Moutoux 1997; Johnson et al. 1997). Three of the samples were from near the surface (Samples 1, 2 and 4) may represent modern pollen. The other four samples are from depths greater than 1 m below ground surface; three are interpreted as being the result of contamination by rodent activity (Samples 26, 30 and 31), and one sample was contaminated during collection (Sample 38). All samples containing *Zea mays* pollen were either from strata that were deposited more recently than 550 ± 70 B.P., 2-sigma cal range A.D. 1295-1465, or before 5680 ± 110 B.P., 2-sigma cal range 4793-4263 B.C. (Cummings and Moutoux 1997:266, Figure J-1). There is no evidence of corn from any other site in eastern Colorado during the post 550 B.P. period, and no evidence of corn from any site on the Plains for the period prior to 5680 B.P., which does seem to support the investigator's explanation of contamination.

Big Red Site (5JF150). In the discussion section of the Ken-Caryl Ranch summary (Johnson et al. 1997:143), the Big Red site is mentioned as having corn and sunflower seeds recovered from the site sediments. The report of the testing of the site (Johnson and Lyons 1997c), however, does not mention the recovery of any macrofloral remains.

Evidence of Horticulture in the Early Ceramic/Middle Ceramic Transition

Plains

Bayou Gulch Site (5DA265). The assumption of corn at Bayou Gulch is based on the presence of *Zea mays* pollen in soil samples and on pieces of ground stone (Gilmore 1991b, Short and Stravers 1981). Pollen traps on site and in the general area surrounding the site did determine that corn pollen was a component of the modern pollen rain on site, and the three soil samples from the surface (Stratum 3) containing *Zea mays* pollen reflect this. More interesting was the presence *Zea mays* pollen in soil samples from Stratum 2b, with bracket ages of 1004 ± 41 B.P. (Features 1 and 3 averaged) and 510 ± 85 B.P., 2-sigma cal range A.D. 1021-1451. *Zea mays* pollen was also recovered from a mano from the lower part of Stratum 2b in grid unit 118N/38W; 30 cm below ground surface, with bracket ages of 1004-870 B.P., 2-sigma cal range A.D. 1021-1195. *Zea mays* pollen was recovered from two stacked metates (Feat 4), in grid unit 138N/50W, 31 cm below ground surface (1004-840 B.P., 2-sigma cal range A.D. 1021-1222). Circumstantial evidence that supports the contention of corn horticulture, is the presence of a bison scapula with use wear and modifications that suggested hafting and use as a digging tool similar to bison scapula hoes found in sites of the Central Plains tradition. This digging tool was recovered from Feature 19, which

returned two radiocarbon ages that were averaged to 895 ± 31 B.P., with a 2-sigma cal range of A.D. 1038-1224.

Franktown Cave (5DA272, L:9:31). Evidence of corn at Franktown Cave includes kernels, cobs, and apparently stalks from corn plants (Nelson et al. 1997). Although the exact provenience of this material and therefore its cultural affiliation is unknown, the assumption is that it is associated with the transitional Early Ceramic/Middle Ceramic materials with an associated radiocarbon age of 890 ± 65 B.P., 2-sigma cal range A.D. 1016-1281. The level of preservation at Franktown Cave is such that there are many samples of corn compared to other sites in eastern Colorado (five cobs, 24 kernels, and an unknown number of stalks),. This might allow for some of this material to be sacrificed for a radiocarbon sample, which would yield a direct date on prehistoric corn horticulture for the western Central Plains.

Early Ceramic Habitation Structures

Brunswig (1996) divides Early Ceramic habitation structures in the Platte River Basin into four subclasses: stone rings; rockshelter lean-to walls; subrectangular stone wall structures; and shallow pit structures. The structures are presented below by subarea. The distribution of Early and Middle Ceramic sites that contain architecture is found in Figure 6-7.

Plains

Three O'Clock Shelter (5WL1997). A low curving wall of piled boulders at least 3 m long and 40 cm high was located just outside the drip line of the shelter (Brunswig 1996). The structure was interpreted as the base of a lean-to. The base of this wall rested in Unit 7 and extended up into Unit 6. This wall probably anchored hide-covered posts that extended onto the shelter wall. Two radiocarbon ages are associated with Unit 7, 1420 ± 60 B.P., 2-sigma cal range A.D. 539-762, and 1510 ± 70 B.P., 2-sigma cal range A.D. 414-662.

Site 5WL2002. This site has one stone circle 4.6 meters in diameter (Brunswig 1996). One small, corner-notched projectile point morphologically similar to Butler's (1986) Type 8 was found 2 m outside the stone circle.

Box Elder-Tate Hamlet (5DV3017). Two large, shallow, circular basins both with internal subfeatures were found during testing and data recovery and interpreted as pithouses (Tucker et al. 1992). Feature 1 measures 2.05 x 2.0 m with a maximum depth of 0.45 m. Feature 1 contained six internal features: three are roasting pits or hearths and three are postholes. Feature 1 had associated radiocarbon ages of 960 ± 60 B.P., 2-sigma cal range A.D. 983-1222 for the feature fill and 1080 ± 100 B.P., 2-sigma cal range A.D. 719-1178 for Feature 1-C, a hearth excavated into the fill of Feature 1, giving this feature a range of 2-sigma cal range A.D. 719-1222, which corresponds to the transition between the Early and Middle Ceramic periods. The arrangement of the three postholes suggests a lean-to structure open to the southeast. The other pithouse, Feature F, measured 2.54 x 2.18 m with a maximum depth of 0.85 m. Feature F had 12 internal subfeatures, including eight hearths or ash pits, one storage pit and three postholes. Feature F had an associated radiocarbon age of 990 ± 60 B.P., 2-sigma cal range A.D. 966-1205 for a postoccupational layer immediately above the floor, which also corresponds to the Early-Middle Ceramic transition. Radiocarbon ages were also obtained from three internal features: 1290 ± 90 B.P., 2-sigma cal range A.D. 608-968 from subfeature F-3; 1330 ± 110 B.P., 2-sigma cal range

A.D. 547-956 from subfeature F-4, and 1360 ± 70 B.P., 2-sigma cal range A.D. 594-790 from subfeature F-10. An archaeomagnetic age range of A.D. 700-950 was also obtained from subfeature F-10. These ages place occupation of Feature F within the Early Ceramic period. The extant postholes in this feature suggest an arrangement of four postholes, one in each corner, with one of the holes having been destroyed by an intrusive hearth (subfeature F-3). This suggests a conical arrangement of four posts over which was placed small branches, brush, or hides. The burning of the superstructure of Feature F is thought to be represented by the presence of a layer of charcoal-stained soil above the occupation floor. This burned deposit returned the 990 ± 60 B.P. radiocarbon age.

Bayou Gulch (5DA265). Feature 33 was a large semicircular basin measuring 7 x 5 m with associated postholes and a possible central hearth. This feature was not well documented, and many of what were originally thought to be postholes were later determined to be krotovinas. The actual postholes were in no recognizable pattern. Feature 5, with an associated age of 1660 B.P., 2-sigma cal range A.D. 252-542, was discovered in the approximate center of Feature 33 and appears to be stratigraphically associated with the hypothesized floor of the structure (unpublished field notes, CDOT 1979; Gilmore 1991b:163-164).

Feature 37 was a partially exposed basin approximately 4 m in diameter, with a central, rock-filled basin hearth. This feature was discovered on the last day of the field season and only one quadrant of the feature was exposed and documented before the excavations were backfilled. A tubular pipe of steatite was recovered from this feature, which suggests that the structure may have had a ceremonial function. No features other than the central hearth were recorded in association with Feature 37 (CDOT 1979).

Hogbacks/Foothills

Kinney Springs (5LR144). This multicomponent open campsite is located near Livermore (Morris and Litzinger 1985a; 1985b). The Early Ceramic component was characterized by small, corner-notched projectile points with convex bases, some with serrated blade edges, and "crude" cord-marked, grit-tempered ceramics. Other artifacts included a range of chipped stone scrapers, bifaces, and choppers; ground stone slabs and handstones; a few bone tools; and a shell bead. This component was assigned to the Hogback phase. An interesting feature associated with the Early Ceramic component is a smooth, oval floor partly surrounded by a rough stone wall, interpreted as a habitation structure. Better preserved portions of this wall are 35-50 cm wide and 25 cm high. The structure measures 2.5 x 3.7 m. A gap in the wall on the southeast side may represent a doorway. Floor matrix from this structure was sampled in 25 cm quadrats, 5 cm thick. Flotation analysis of the samples resulted in the recovery of charcoal, bone fragments, seeds, macroartifacts and microdebitage. Interpretation of the nonrandom distribution of these materials allowed for the formulation of intramural activity hypotheses. Unfortunately, these interpretations are not available. A radiocarbon age of 950 ± 60 B.P., 2-sigma cal range A.D. 989-1226, was returned from the floor of the structure; a radiocarbon age of 1120 ± 60 B.P., 2-sigma cal range A.D. 782-1023, was returned from a hearth 15 cm below the floor of the structure. Other radiocarbon ages from the Early Ceramic component are 1510 ± 70 B.P., 2-sigma cal range A.D. 414-663 and 1650 ± 70 B.P., 2-sigma cal range A.D. 243-592.

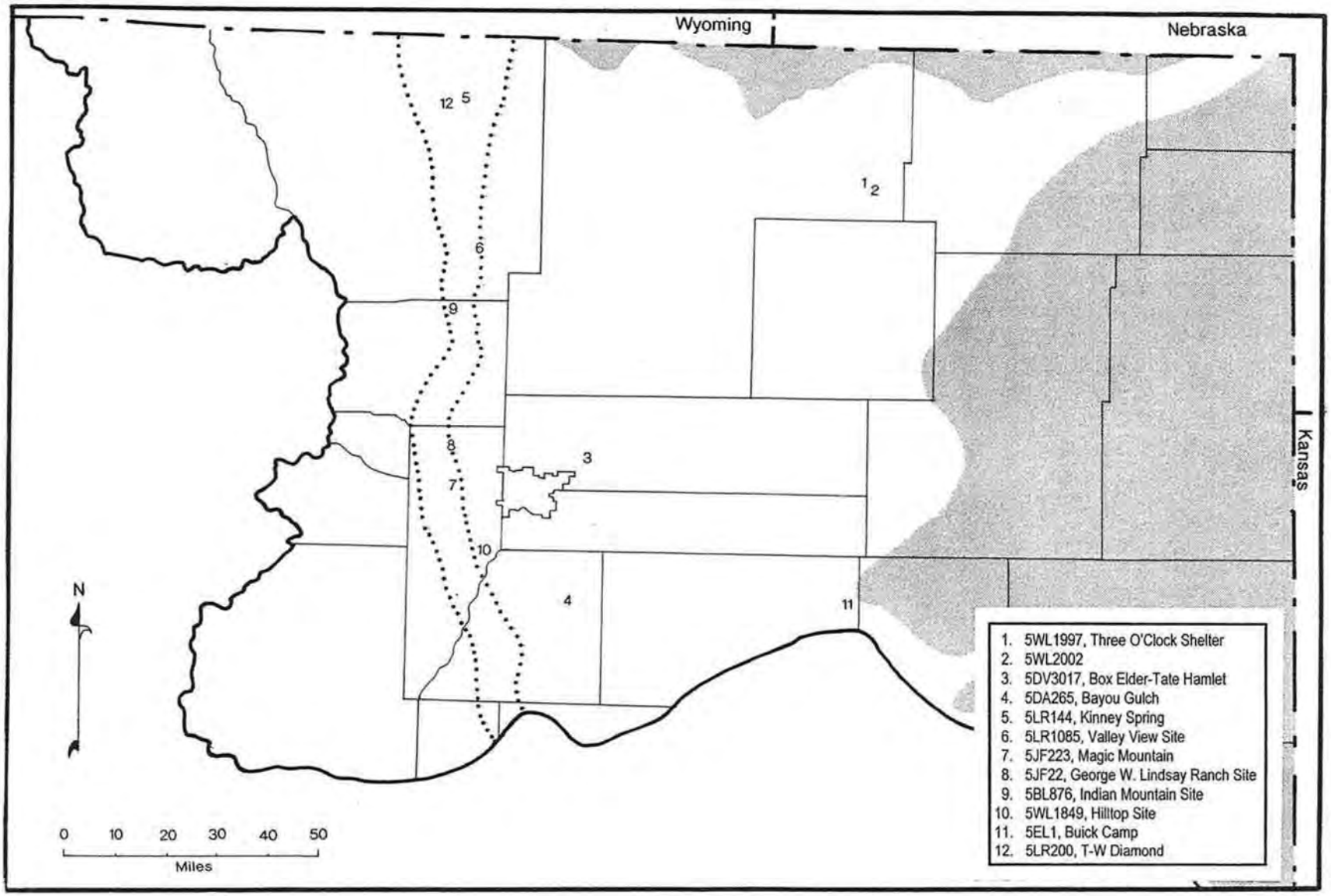

Figure 6-7. Distribution of Late Prehistoric sites with habitation structures.

Valley View Site (5LR1085). This open multicomponent camp/architectural site is situated on an east facing bench on a hogback ridge west of Loveland in southeast Larimer County (Brunswig 1990a; 1999). Two components, Late Archaic and Plains Woodland, were identified, the later of which was subdivided into two subcomponents (2A and 2B). Four stone circles were recorded at the site, and two of these (Structures 1 and 2) were excavated. Structure 1 was a roughly oval, 2 m diameter ring of sandstone rocks. Interior features included a well-packed floor and a small concentration of burned rock in a shallow pit near the north edge of the structure. A small, corner-notched projectile point was recovered from near the center of the structure, and a side-notched point was recovered from beneath one of the foundation stones. Structure 1 may have resembled a wickiup, with a superstructure of tree branches, tree boughs, and possibly animal skins anchored by the circle of stones. A radiocarbon age of 1840 ± 50 B.P., 2-sigma cal range A.D. 65-339, was returned for a charcoal lens in subcomponent 2A, beneath the foundation stones of Structure 1.

Structure 2 is a very shallow circular stone-walled pitstructure, 3.5 meters in diameter. The hypothesized height of the stone wall is estimated to be 50 to 75 cm. Cultural deposits within the structure are 40 cm thick. The structure contains an internal hearth and several ground stone tools piled up near the northwest wall. The superstructure may have consisted of a forked stick framework with a wattle and daub covering. Dried and heated mud "chinking" was found in the cultural deposits within the structure. A "wingwall" 4 m long extended to the southeast from the exterior wall of the structure and was interpreted as the base of a lean-to that created a south-facing, sheltered work space. Projectile points, ceramics, unmodified flakes, charcoal, and animal bone were recovered from the area hypothesized as within the lean-to. A radiocarbon age of 1080 ± 60 B.P., 2-sigma cal range A.D. 782-1149 was returned for a lower surface associated with the subcomponent 2A. This surface was beneath the foundation stones of Structure 2, which was associated with component 2B. A radiocarbon age of 1160 ± 60 B.P., 2-sigma cal range A.D. 692-1017 was returned for charcoal from the central hearth in Structure 2. A radiocarbon age of 1330 ± 50 B.P., 2-sigma cal range A.D. 611-801, was returned from a roasting pit (Feature 2) located just east of the Structure 2 wingwall.

Magic Mountain Site (5JF223). Two remnants of superimposed habitation structures (Features 9 and 11) were found during excavation of the site in 1994 and 1996 by Centennial Archaeology (Kalasz and Shields 1997). Feature 9 consists of a possible sandstone slab floor (Feature 9b), a concentration of rock on the east side that is interpreted as wall fall (Feature 9a), and two areas of dark fill with decomposed sandstone flooring on the north side (Feature 9d east and west). The central floor of the feature is mounded up and slopes down to the boundaries of the feature, and a sloped basin on the south side of the floor was thought to be a ramp. Based on the plan map (Kalasz and Shields 1997:284), the feature is approximately 4 m northwest/southeast and almost 3 m northeast/southwest, although exact dimensions of the feature could not be determined because of looter disturbance on the west and northwest sides of the feature and somewhat indeterminate boundaries. No postholes or other interior features are associated with this feature, and there is no evidence of a superstructure. Three radiocarbon ages are associated with Feature 9; two identical ages of 1310 ± 70 B.P., 2-sigma cal range A.D. 607-937 were returned for samples from Feature 9b (floor) and Feature 9d (west), and an age of 1620 ± 60 B.P., 2-sigma cal range A.D. 261-599 from Feature 9d east.

Feature 11 consists of an extensive semicircular alignment of cobbles and boulders deposited mostly on Lyons Formation bedrock at the base of the alluvial cultural deposits. The feature extends north into the unexcavated portion of the site, and so the northern boundary of the

feature is unknown. A plan map of the feature suggests that it is at least 7 m in diameter (Kalasz and Shields 1997:288). The wall was constructed to take advantage of the configuration of the bedrock on which the wall was constructed; steeply dipping projections of the underlying Lyons Formation were incorporated into the wall. No unequivocal postholes were discovered, although the wall rubble was not removed and postholes may exist under the wall collapse. One small piece of daub is the only indicator of possible superstructure construction. No indication of a floor, especially a prepared floor like that found in Feature 9, was observed. Feature 11 is for the most part stratigraphically below Feature 9; however, in the area of the grid block where bedrock becomes shallow, the cultural deposits are telescoped, resulting in what appears to be a merging of Feature 9d with Feature 11. Three radiocarbon ages were associated with Feature 11. An age of 1370 ± 80 B.P., 2-sigma cal range A.D. 541-865, was returned from a sample recovered from the top of the Feature, and ages of 1930 ± 70 B.P., 2-sigma cal range 51 B.C.-A.D. 317, and 1760 ± 50 B.P., 2-sigma cal range A.D. 132-417, were recovered from the base of the Feature 11 wall. Statistical overlap of the early and late dates from Features 9 and 11 suggests that both of the features were reused throughout the Early Ceramic period.

George W. Lindsay Ranch Site (5JF11). The two structures associated with this single component Early Ceramic campsite were located on the spine of a hogback formed of upthrust Fox Hills Sandstone (Nelson 1971). These structures were constructed of stacked rock arranged in a square, 3.6 m (12 ft) on a side and 1.2 M (4 ft) apart. Room A was the southernmost room, and described as an open-ended square. This square was oriented with the diagonal of the square slightly east of north, with the southeast wall being the open side. The stones used in the wall construction ranged between a few pounds to more than 45 kg (100 lb). The wall surrounded a floor that may have been partially smoothed, but mostly followed the natural contours of the ground surface. The only internal feature in Room A was a basin hearth near the northwest wall, and surrounding this feature was a concentration of flakes and tools. The floor of Room B, northwest of Room A, was a shallow excavated square pit, and the rock wall completely surrounds this pit. Internal features included three rock-filled hearths, one in the east corner, one in the north quadrant, and one on the north side of a boulder in the south quadrant of the structure. A shallow pit in the west corner that was thought to have been a storage basin. The superstructure for these structures may have been a wickiup or tipi-like structure.

Indian Mountain Site (5BL876). This open architectural site is situated eastern side of the Dakota hogback east of Lyons, in northeastern Boulder County (Cassells and Farrington 1986). The site consists of the remnants of 10 stone circles in three discrete groups (Areas 1, 2, and 3), representing the remains of at least two Early Ceramic occupations. Excavation units were placed in all three areas, and six of the 10 rings were at least partially excavated. Three of the six stone rings contained at least the remnants of internal hearths, and AMS radiocarbon ages were returned for small samples from diffuse scatters of charcoal associated with the hearths. An age of 1120 ± 200 B.P., 2-sigma cal range A.D. 552-1288, from Ring 3 in Area 1, and 1280 ± 195 B.P., 2-sigma cal range A.D. 404-1168, from Ring 1 also in Area 1 define the later Early Ceramic component. A radiocarbon age of 2140 ± 200 B.P., 2-sigma cal range 772 B.C.-A.D. 329 was returned from a scatter of charcoal within Ring 4. The size of the circles and the number of rocks used in each circle, were remarkably consistent. Ring 1 was made of 35 stones, had an internal diameter of 4.7-4.0 m and an exterior diameter of 5.6-6.0 m. Ring 2 was an incomplete arc that may represent a ring scavenged for its rocks, but is estimated to have had an internal diameter of 4.4 m, and an estimated external diameter of 4.7 m. Eight stones remain. Ring 3 was made of 26 stones and had an internal diameter of 5.3-4.0 m, and an external diameter of 5.8-5.5 m. Ring 4 consisted of 34

stones and had an internal diameter 4.6-4.2 m and an external diameter of 6.6-6.0 m. Ring 5 consisted of 34 stones and had an internal diameter of 4.9-5.6 m and an external diameter of 6.0-6.9 m. Ring 6 consisted of 36 stones and had an internal diameter of 5.1 m and an external diameter of 5.8-6.6 m.

MIDDLE CERAMIC PERIOD, A.D. 1150-1540

With a few notable exceptions, most of the documented Middle Ceramic components are found in multicomponent sites that also contain substantial Early Ceramic components (Figure 6-8). In most circumstances, there is little or no stratigraphic separation between the components, resulting in the possibly unique attributes of the nontemporally diagnostic portions of the Middle Ceramic artifact assemblages to be obscured by the usually greater number of artifacts associated with the Early Ceramic occupations. This pattern suggests that Middle Ceramic settlement patterns were similar (especially on the Colorado Piedmont) to those of the Early Ceramic period, indicating cultural continuity. The comparatively small number of Middle Ceramic components found in the Colorado Piedmont may in part be a visibility problem; relatively minor changes in the archaeological record between the terminal Early Ceramic and Middle Ceramic is apparent in this area, unlike the substantial changes manifested in the archaeological record farther east. In the Central Plains, the changes in material culture and subsistence/settlement patterns that occur during the transition between the Woodland groups of the Early Ceramic and the Middle Ceramic Central Plains tradition are obvious and easily identified in the archaeological record. The relative stability of adaptive patterns in eastern Colorado is exemplified by well-dated sites such as Rock Creek, Box Elder-Tate Hamlet, the Senac site and Bayou Gulch, among others. All of these sites contain late components with associated ages that would place them in the Middle Ceramic as previously defined by most investigators (post-A.D. 1000), and exhibit patterns that appear to be unchanged except for relatively minor changes in technology and that lack the classic Upper Republican collared rim ceramics.

The seeming decrease in actual numbers of Middle Ceramic sites may also be partly due to shifts in settlement patterns that favored locations subject to geologic processes that resulted in the destruction or burial of these sites. The decline in numbers of radiocarbon ages reflected in the slope of the curve in Figure 1-2 becomes steeper just after the end of a period of surface stability on eolian landforms, which is probably due to decrease in effective moisture. This decrease in radiocarbon ages could also reflect an actual decrease in population between 1100 and 500 B.P. to Late Archaic levels in response to a decrease in effective moisture. Most of the larger, more complex, single-component Middle Ceramic period sites in Colorado are found on or close to the edge of the High Plains, and contain artifact assemblages that are much more obviously related to Upper Republican peoples to the east. These sites may represent a different group of people moving into the area as opposed to indigenous populations acquiring new ideas from the east. The drop in absolute numbers of radiocarbon ages for Middle Ceramic components may be in part the result of sample bias or some other factor relating to site viability or preservation. However, sample bias can not completely explain this decrease. Although there is danger in generalizing, not only does there seem to be a relatively steep drop-off of dated components at the end of the Early Ceramic period similar to the even more precipitous increase in dated components at the transition between the Late Archaic and the beginning of the Early Ceramic, the components

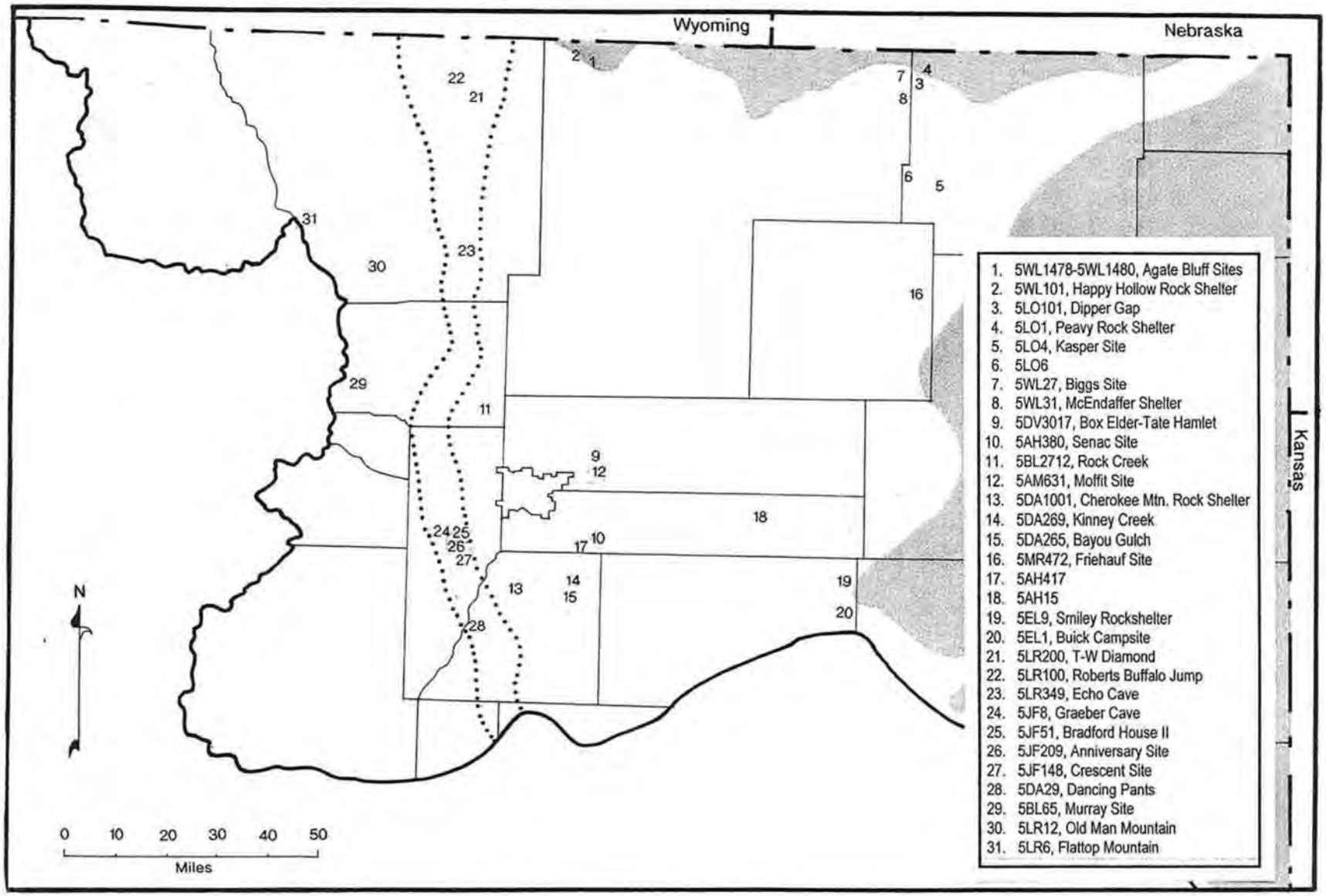

Figure 6-8. Distribution of Middle Ceramic sites in the Platte River Basin.

themselves contain a comparatively sparse number of artifacts and exhibit a decrease in assemblage diversity. This pattern suggests shorter, more infrequent occupation by smaller groups of people.

Middle Ceramic Campsites

Plains

Agate Bluff Sites: Agate Bluff I (5WL1478), Agate Bluff II (5WL1479, Porcupine Cave), Agate Bluff III (5WL1480, Fire Cave), Agate Bluff IV (5WL1481, Woodland Cave). As mentioned above in the Early Ceramic period, these four rockshelters are found in a large bluff 8 km (5 mi) south of the Wyoming state line in northwestern Weld County. At sites I, II, and III most of the cultural material found was associated with components given an Upper Republican affiliation. All of the shelters contained an upper, culturally sterile stratum, with one or two lower natural strata that contained artifacts and features. Because of the similarity in cultural materials and stratigraphy, the artifacts from all three shelters were described together. Although cultural materials were mixed in all occupation levels, more than 75 percent of the diagnostic projectile points and ceramics were assigned to the Upper Republican culture, and by extension, most of the nondiagnostic artifacts are probably also associated with the Upper Republican component.

A total of 120 classifiable projectile points was recovered from sites I-III. Ninety-six of these were small, triangular, side-notched projectile points, some with basal notches, and unnotched points that were assigned to this component. Other chipped stone tools included five end scrapers, nine bifacial knives (five ovoid, three diamond shaped, and one triangular), four drills, and 23 utilized flakes. Ground stone artifacts included a mano of micaceous schist and three metate fragments of sandstone not found within an 80 km (50 mi) radius of the site (Irwin and Irwin 1957:19). Bone artifacts included 118 tubular beads found with a bone pendant in a an oval pit (Feature 4), five incised beads, 12 small discoidal beads, three awls, and a bone scoop. A shell pendant (cf. *Lampsilis*) was also found. Two types of pottery were defined for the Upper Republican components. The majority of identified sherds were designated Owl Creek Fine Cord-marked (n=96, 9 rim sherds), with collared rims decorated with parallel horizontal lines, or flaring, uncollared rims either unmarked or with diagonal incisions. Surface treatment is cord marking with partial to almost total obliteration or polishing. All vessels are shouldered. Body sherds of Owl Creek Rough Cord-marked (n=31, 5 rim sherds) exhibit coarse, parallel, vertical cord impressions; 75 percent are polished. The five rim sherds are decorated with small luglike modeled undulations of the rim. Some have paired diagonal incisions on the lip and others are plain. Faunal remains were dominated by bison and elk, with pocket gopher, pronghorn, cottontail, coyote, mule deer, prairie dog, and bird, represented. One grizzly bear tooth was also found. A single kernel of Dent corn was found 1.4 m (4.5 ft) below the surface, beneath rock fall from the overhang. Examination of the stratigraphic profile suggests that at this depth the corn would have been found close to bedrock; caution should be used in assigning this cultigen to either the Upper Republican or Woodland component.

Happy Hollow Rock Shelter (5WL101). This site is located approximately 5 km (3 mi) northeast of Carr, in northwest Weld County (Steege 1967). The site is within a southeast-facing rockshelter situated near the top of a bluff formed in what is described in the report as the Arikaree Formation, but is mapped as the Ogallala Formation (Tweto 1979). This site is approximately 5 km (3 mi) northwest of the Agate Bluff sites, and is in many aspects similar. These bluffs are all a part of the

High Plains escarpment that forms the boundary between the Colorado Piedmont and the High Plains to the north and east. The site contains four strata, the first of which was a culturally sterile deposit at the surface of the site at the time it was excavated. The second stratum is the occupation level and the third is a thick, laterally discontinuous cultural lens. The fourth stratum was a culturally sterile clay that rested on bedrock.

Most of the cultural material recovered from excavation was associated with the Upper Republican component. Recovered projectile points included thirty-five small, triangular, unnotched points; 29 small, side-notched points; two points with one side-notch; and two points with side- and basal notches. Other chipped stone tools included 30 scrapers, six spokeshaves, 53 bifacial knives, three drills, two with expanding bases, two gravers, and one large ovoid chopper. Thirteen exhausted polyhedral cores and 1,638 flakes were recovered. Lithic raw materials were fairly evenly represented in the debitage (36 percent quartzite, 32 percent jasper, 27 percent agate, 4 percent chert, and 1 percent metamorphosed siltstone). Ceramic analysis used Agate Bluff as a model, and the criteria for determining types were almost identical. Ceramics were divided into three types: Upper Republican Fine Cord-marked, Upper Republican Rough Cord-marked, and Woodland. The ceramics assigned an Upper Republican affiliation were similar to those at Agate Bluff, with 194 of the 198 identifiable sherds given an Upper Republican association. A small ground stone assemblage consisting of three complete manos, two mano fragments and 13 metate fragments was recovered. The sandstone from which the metates were manufactured does not occur locally. Three complete and four fragmentary shaft abraders were recovered, with groove widths varying between 6 mm and 9 mm. Several pieces of hematite were found, many exhibiting ground facets on one or more surfaces. A quartz crystal and a cluster of two calcite crystals were found in the occupation level. Bone artifacts included eight bone and two elk antler flakers, 22 awls, two fragmentary shaft wrenches, two bone knifes, and three tubular bone beads Eight tubular mammal bones with beveled ends were found; the function of these artifacts is unknown. Faunal remains in order of occurrence were elk, bison, pronghorn, deer, prairie dog, rabbit, and packrat. One calvarium and four mandibles of domestic dog, one bear tooth, and one small unmodified piece of shell were also found. The occupation level has bracket ages of 1270 ± 80 B.P., 2-sigma cal range A.D. 639-968, from Hearth 5 at the base of the occupation, and 780 ± 90 B.P., 2-sigma cal range A.D. 1036-1396, from Hearth 3 near the top of the occupation zone. Interpretations and conclusions mirrored those of Irwin and Irwin (1957) at Agate Bluff. Most of the materials were assigned to the Upper Republican aspect, probably related to the Lost Creek focus (Strong 1935), but also reflected a "rather marginal sedentary culture adapted to a more nomadic type of hunting and gathering pattern" (Steege 1967:22).

Dipper Gap Zone A (5LO101). This site is located in northwest Logan County, approximately 37 km (23 mi) north of Stoneham, 13 km (8 mi) south of the Nebraska state line (Metcalf 1974). The site is situated on top of a butte on the southern margin of a valley that contains several springs. Three site loci were investigated, and in only one, the Crack, were Late Prehistoric stage diagnostic artifacts found. In the Crack, five major natural stratigraphic units (I-V, numbered from bottom to top) and two laterally discontinuous subunits (IIa and Iva) were identified. Middle Ceramic cultural materials were found within Stratum V and on the surface, which was designated Occupation Zone A. Two small, triangular, side-notched points and one small, unnotched point were recovered from Occupation Zone A, and one small, triangular, side-notched point from high in Stratum IV were associated with the Middle Ceramic occupation. The chipped stone assemblage from Occupation Zone A consisted of five end scrapers, two side scrapers, two perforators, one spokeshave, four retouched flakes, and 527 pieces of debitage. One mano was the

only piece of ground stone associated with this component. Rabbit bones were the only faunal materials from this level. No absolute ages are associated with this component.

Peavy Rockshelter, 5LO1. This site is a rockshelter that contains, based on material culture, a single Middle Ceramic period component (J. J. Wood 1967). Diagnostic artifacts included unnotched (n=22) and laterally notched (n=18) projectile points. Bifaces, end scrapers, retouched flakes, ground stone and hammerstones were also recovered. Two pieces of incised shell and one piece of unmodified shell, as well as a bone bead and bone and antler tools, were also found. Ceramic artifacts included 102 cord impressed and extensively smoothed sherds representing at least five medium-sized globular vessels. The interior and exterior surfaces of these vessels were slipped, and hematite was added to the interior slip, resulting in a baked-on red color. Five rim sherds, five rim sherd fragments, and a lug or handle suggest that these vessels were shouldered with flaring, uncollared rims. Faunal remains included bison, pronghorn, prairie dog, cottontail, bird, fish, and meadow vole. Two flexed human burials were found, one of which was associated with the Middle Ceramic component, the other was interpreted as postdating the major occupation based on stratigraphic association. Both of these burials are described below in the burial section. Two radiocarbon ages are available from Peavy Rockshelter. One of these, 810 ± 125 B.P., 2-sigma cal range A.D. 993-1409, from Feature 2 was associated with the Middle Ceramic period occupation. The second age, 1145 ± 155 B.P., 2-sigma cal range A.D. 622-1224, from Feature 5, was stratigraphically below Feature 2 and was attributed to an undefined, earlier occupation.

Kasper Site (5LO4). Similar to 5LO6 below, the cultural deposits at this open campsite, 4 km (2.5 mi) north of Pawnee Pass, were thin (10-20 cm). J. J. Wood (1967) identified both Middle Ceramic and Early Ceramic components, but the paucity of artifacts and lack of deposition made separation of the components impossible. One unnotched and two side-notched points were associated with the Middle Ceramic component. A radiocarbon age of 655 ± 250 B.P., 2-sigma cal range A.D. 889-1954, from Feature 3, a slab-lined hearth, is also associated with this component. Seven corner-notched projectile points, two stemmed dart points, and five cord-impressed sherds were also recovered. The rim of this vessel is vertical and unthickened, and the cord impressions are partly obliterated. These artifacts were attributed to the Early Ceramic component.

Site 5LO6. This slightly sheltered camp is situated at the base of a bedrock scarp that has an 80 cm deep overhang (J. J. Wood 1967). The natural and cultural stratigraphy is thin; 15 cm of unconsolidated sediments are deposited on bedrock. Chipped stone tools included one unnotched, two side-notched and two corner-notched projectile points, and a drill. No ceramic or ground stone artifacts were found. A radiocarbon age of 545 ± 150 B.P., 2-sigma cal range A.D. 1219-1658, is associated with Feature 1.

Biggs Site (5WL27). Three stratigraphic units (I, II, III) were identified at Location I of this open campsite (J. J. Wood 1967). Stratum II contained most of the cultural material recovered from this locality and was divided into three subunits based on the position relative to two superimposed living floors, Features 1 and 2. Both of these features were defined by scatters of bison and other mammal bones. Bison bone from Features 1 and 2 returned radiocarbon ages of 735 ± 105 B.P., 2-sigma cal range A.D. 1043-1419, and 695 ± 110 B.P., 2-sigma cal range A.D. 1069-1437, respectively. One unnotched projectile point, one fragment of a projectile point, and a few flakes were associated with Feature 1. Feature 2 contained no associated artifacts.

McEndaffer Shelter (5WL31). This multicomponent sheltered camp is in a large, south-facing rockshelter (J. J. Wood 1967). Artifacts recovered from mixed Early and Middle Ceramic deposits included 18 small, side-notched points, 14 unnotched points, and five small corner-notched points. Other chipped stone artifacts included 23 bifaces and biface fragments, 15 end scrapers and fragments, 39 retouched flakes, and one drill. Ground stone artifacts included handstones, slab milling stones and shaft abraders. Two hundred forty-three ceramic sherds representing 10-12 vessels were also recovered. One group of sherds from cord-marked vessels with vertical to slightly incurving rims were given an Early Ceramic affiliation. One of these vessels had a thickened conoidal base with impressions from a coiled basket. Sherds from Middle Ceramic vessels were from globular pots with smoothed cord marks on the exterior surface, and rims were either collared with incised lines on the lip and horizontal parallel lines on the collar, or slightly flaring and plain. Faunal remains included prairie dog, cottontail, bison, and pronghorn. Human remains consisting of toe bones and teeth were found scattered through the deposits. No radiocarbon ages are associated with this site.

Box Elder-Tate Hamlet (5DV3017). This multicomponent open campsite, described in detail in the Early Ceramic section, also contained a Middle Ceramic component (Tucker et al. 1992). One small, side-notched projectile point provisionally assigned to the Plains Side-notched type, was found on the surface during the initial reconnaissance of the site in 1989. Two of the hearths have associated ages that fall within the Middle Ceramic period. Feature O, located just a few centimeters from Feature 1, a pit structure, has an associated age of 760 ± 100 B.P., 2-sigma cal range A.D. 1036-1405, and Feature I, located 2 m east of Feature F, also a pit structure, has an associated age of 630 ± 90 B.P., 2-sigma cal range A.D. 1238-1444. Artifacts recovered from Feature O included several pieces of debitage, metate fragments, and a small, corner-notched projectile point. This feature also contained numerous large mammal long bone fragments, both charred and uncharred, and floral remains including saltbush, Cheno-Am, grass seeds, and wild rose seeds. Feature I contained debitage and ceramics, including both Early and Middle Ceramic types, and faunal and floral remains comparable to those from Feature O. The mixed nature of the artifact assemblage suggests a mixing of components, or it can be interpreted as representing stability of the Early Ceramic cultural pattern and the persistence of this cultural manifestation into the Middle Ceramic period in this area.

Senac Site (5AH380). A late component from this site is represented by one large, plain ceramic sherd recovered from the backdirt of a backhoe trench (O'Neil et al. 1988). The flared rim, neck and a small portion of the shoulder are present. The early steps of manufacture are unknown, but paddle and anvil were used before the surface was scraped. The inner rim, lip, rim, and shoulder were polished with a smooth stone prior to firing. This sherd was compared to wares from the Central Plains and Coalescent traditions (Pawnee, Nebraska culture, Upper Republican and Smoky Hill), or Dismal River. The only similarity was with the ceramics of an unnamed culture collected from two sites in western Nebraska.

Rock Creek Site (5BL2712) There was insufficient vertical and horizontal stratigraphic separation, change in site function and technological change in the artifact assemblages to distinguish the Middle and Early Ceramic components at this site. The detailed description of this site is presented in the Early Ceramic section. The youngest and most undisputably Middle Ceramic radiocarbon ages from the Rock Creek site, 650 ± 110 B.P., 2-sigma cal range A.D. 1191-1449, and 780 ± 90 B.P., 2-sigma cal range A.D. 1036-1396, are derived from charcoal samples not associated with any feature and represent stratigraphic ages (Gleichman et al. 1995).

Moffit Site (5AM631). This multicomponent open camp is situated on the top of a hill that is part of the low, interfluvial ridge system dividing the drainages of First Creek and Second Creek (Tucker 1994). The site is northeast of Aurora and 1.6 km (1 mi) east of the boundary of the Rocky Mountain Arsenal Wildlife Refuge in western Adams County. Two strata were identified during test excavations at the site; Layer I extended from the surface to 15 cm below the surface, and represented the plow zone, and Layer II extended from 15 to 20 cm to an unknown depth. Most of the mixed historic and prehistoric cultural material recovered during excavations was from the upper 10 cm of sediments. All six of the formal tools from the site were collected from the surface, and the four classifiable projectile points suggest that the site was occupied during the Late Archaic, Early Ceramic and Middle Ceramic periods. A small, side-notched projectile with a part of the base missing was assigned to the Middle Ceramic component. A late-stage biface midsection and an end scraper were also recovered from the surface, and 37 pieces of debitage were recovered from the test units. Three small, ceramic body sherds were also recovered from the surface. These sherds were from the lower part and bottom of a globular, cord-marked vessel that, based on the compact fine paste, hardness and surface treatment, was identified as Upper Republican. Four manos or mano fragments and one metate fragment were found during survey and testing. Thirteen surface features were identified at the site, and the intact lower portion of a basin hearth (Feature L) was excavated. Contents of Feature L included charred seeds of goosefoot, flatsedge, and nutgrass; a fragment from a starchy edible tuber; fragmented large mammal bone; and debitage. Saltbush and cottonwood was burned as fuel in the hearth. A sample of charcoal from Feature L returned a radiocarbon age of 620 ± 60 B.P., 2-sigma cal range A.D. 1288-1420. Results of test excavations indicate that the Middle Ceramic inhabitants of the site were processing edible seeds and tubers, crushing animal bone to extract the marrow and/or bone grease, and tool manufacture and maintenance.

Cherokee Mountain Rockshelter (5DA1001). This single-component sheltered camp is situated in a small, south-facing rockshelter (11 x 7.5 x 4.5 m high) at the base of a small mesa of Castle Rock conglomerate above Dawson Formation arkosic sandstone (Nelson and Stewart 1973). The site overlooks Plum Creek to the south and is located approximately 32 km (20 mi) south of Denver in north-central Douglas County. Three similar, cultural strata representing three occupations, separated by thin, culturally sterile deposits were identified and numbered Levels 1-3 from bottom to top. Projectile points were morphologically similar in Level 1 (n=4) and Level 2 (n=21), with small, side-notched points with both straight and concave bases, and straight to constricting stems, represented in both levels. Two small corner-notched points, one from Level 1 and one from Level 2, were also recovered. The corner-notched point from Level 1 had a serrated blade edge. The only projectile point from Level 3 was a fragmentary side-notched point with a straight base. Two tri-notched points were recovered from Level 2. The illustrated example of this type has two side notches, a concave base with a central notch, and an expanding stem, giving the point a spurred appearance (Nelson and Stewart 1973: Figure 4). Level 2 also contained four unnotched points or preforms and two points with only one side notch. Other chipped stone artifacts include two end scrapers, seven knives and one broken drill. Four plain ware ceramic sherds (one rim and three body sherds) were recovered from Levels 2 and 3. The rim is slightly incurving with a rounded lip, and the interior exhibits brush marks. Two body sherds exhibit brush marks on their exterior surfaces, and the third is slightly fingernail impressed over brush marks. All of the sherds are tempered with mica. The ground stone assemblage consisted of two hammerstones, one shaft abrader, two basin metates (one each from Levels 1 and 2), five metate fragments, and two bifacial manos recovered from a disturbed area. Three bone awls were also recovered. Faunal remains were too fragmented for identification. Based on Kehoe's (1966) typology for small side-notched

points on the Northern Plains, the occupations of the shelter postdated A.D. 1250, and based on comparisons of points and ceramics, the prehistoric occupants of the shelter were thought by the authors to have been Shoshonean (Nelson and Stewart 1973).

Kinney Creek Site (5DA269). This large multicomponent open campsite is situated on the summit and north-facing slope of a low hill overlooking Kinney Creek, 5 KM (3 mi) south of Parker, in northeast Douglas County (Miller and Fiero 1977). As an ongoing part of highway construction projects, the site has been subject to four separate episodes of test excavation between 1977, when the site was first recorded, and 1991. Test excavations in 1979 uncovered four subsurface features, including Feature 3, a large (1.2 x 1.3 x 0.21 m), rock-filled basin roasting pit. A radiocarbon age of 620 ± 55 B.P., 2-sigma cal range A.D. 1285-1427, from Feature 3 is the only absolute date from the site (Amini-Minor 1983). No diagnostic artifacts were recovered from the subsurface in association with Feature 3, but four micaceous sherds recovered from test excavations in 1990 (>100 m from the 1979 excavations) were from a vessel manufactured by coiling and scraping and thought to represent either Taos Micaceous (Pueblo) or Jicarilla Apache ware (Bridges 1991:15). In addition, a single sherd recovered from the surface of the site had affiliation with the late Woodland tradition or the Upper Republican phase (Gilmore 1989a:32). Charred macrofloral remains from Feature 3 (and other undated features) indicate *Chenopodium* (goosefoot) and *Opuntia* (prickly pear cactus) were processed on site during the Middle Ceramic period.

Bayou Gulch Site (5DA265). This site is described more fully in the preceding Early Ceramic period section, and so general features concerning the site will not be repeated here. Compared to many sites along the base of the Front Range, evidence of Middle Ceramic occupations at Bayou Gulch is relatively abundant. Several Middle Ceramic projectile point types were recognized, but there is little interpretation of these components beyond this recognition. Points with low side notches and concave bases that are morphologically similar to Avonlea points (Gilmore's [1991b] Type 9, n=5) were recovered from both Early and Middle ceramic strata. Avonlea points are for the most part restricted to the Northern Plains and prairies. Whether these points represent occupation of the site by people culturally affiliated with northern populations or simply represent morphological variation within the continuum of point styles manufactured by populations indigenous to the area remains to be investigated.

Other small, side-notched points with rounded stem edges and concave, straight to convex bases are morphologically similar to Prairie Side-notched (Gilmore's [1991b] Type 10, n=12, with three more from initial survey and testing) and Plains Side-notched types (Gilmore's [1991b] Type 11, n=13, with one additional point found during survey and testing) described by Kehoe (1966) in his typology of small, side-notched points on the Northern Plains. Some of the Type 10 points with concave bases also fit within the range of variation of Avonlea points. Among the Type 11 points are eight tri-notched points (cf. Butler's [1986] Type 15). On the Central Plains, tri-notched points have co-occurred with side-notched points in components affiliated with the Upper Republican phase, yet on the Northern Plains tri-notched and side-notched points are often associated with Intermountain ceramics in occupations thought to represent Shoshonean components (Frison 1971). Both side-notched and tri-notched points were found in components interpreted as Shoshonean at the Cherokee Mountain Rockshelter (Nelson and Stewart 1973). Butler (1986:299) points out that points of this type are widespread throughout North America, which limits the use of these types as culturally diagnostic, if not temporally diagnostic. Seven plain ware rim sherds and six plain ware body sherds were recovered during excavations (Ellwood

1987). The interior and exterior of two of the rim sherds exhibit wiping striations, and the rest are plain. One sherd exhibits two junctures in profile which could be indicative of slab construction. Ellwood (1987) considered this type (Type II) to actually be a category, and did not assign these sherds to a cultural affiliation, stating that these sherds may be wiped rims from otherwise cord-marked vessels, or be derived from vessels with smoothed/wiped surfaces. Sherd sizes were too small to indicate vessel configuration. Radiocarbon ages from Bayou Gulch that fall into the Middle Ceramic period are 640 ± 65 B.P., 2-sigma cal range A.D. 1279-1421, for Feature 21, and 510 ± 85 B.P., 2-sigma cal range A.D. 1297-1627, for Feature 33. One of Gilmore's (1991b) Type 10 points (Prairie Side-notched) was found in proximity to but not in direct association with Feature 33. Type 9 points (Avonlea) were also thought to be stratigraphically associated with this feature.

Friehauf Site (5MR472). This multicomponent open campsite is situated on top of and within the stratified sediments of a large sand dune overlooking Beaver Creek, 7.2 km (4.5 mi) south of its confluence with the south Platte River, approximately 16 km (10 mi) west of the High Plains escarpment in eastern Morgan County (Dominguez 1986; Madole 1994). Collared rim sherds with five inscribed horizontal lines on the outer surface as well as body sherds and side-notched points were found associated with three weakly and one moderately developed buried A horizons, designated Levels V, VII, IX and the upper part of XI from top to bottom. The lower part of Level XI also contained Early Ceramic and Late Archaic cultural materials. Humus from Level IX returned a corrected radiocarbon age of 860 ± 90 B.P., 2-sigma cal range A.D. 998-1296, which should represent a median age for the Upper Republican occupations. A more complete description of this site can be found above in the Early Ceramic period section.

Site 5AH417. This site is located in west-central Arapahoe County, on a northeast facing slope overlooking a large intermittent drainage 5 km (3 mi) northeast of Parker (Joyner 1989). Cultural materials recovered from survey and testing phases included two bifaces, 49 flake tools, six pieces of tested petrified wood, and 114 pieces of debitage. Ninety-seven percent of the chipped stone assemblage was of locally available Dawson Formation petrified wood. The most important artifacts recovered were 47 sherds. These sherds are from a globular jar with a flaring rim and a handle constructed from two ropes of clay twisted around each other. Construction is by coiling, with the coil junctures obliterated by wiping on the interior, and by fingernail impressions on the exterior. A thermoluminescence date of A.D. 1525 ± 90 was returned for one of the sherds. Although this jar exhibits characteristics from several different cultural traditions, it is thought to be of Ute origin.

Site 5AH15. This large, single-component open camp is situated on the top of a bluff overlooking Middle Bijou Creek to the east, approximately 9 km (5.5 mi) southeast of Beyers in eastern Arapahoe County (Gilmore 1991a). Cultural material was found on the surface and buried within the reworked upper 10 cm of a deposit of Pleistocene-age loess. The upper 10 cm of loess has been reworked and redeposited during the late Holocene, resulting in the burial of some of the artifacts deposited on what is actually a relatively stable surface. One fragment of a side-notched projectile point, collected from the surface, was the only diagnostic chipped stone artifact. This artifact was missing the proximal end and one lateral margin. Other chipped stone tools found on the surface of the site included two projectile point fragments, 14 fragmentary bifaces, one end scraper, and two modified flakes. Edge wear on these artifacts suggests an even split between processing soft materials (butchering, hide processing) and processing hard materials (wood, bone, horn). Debitage recorded from the site, including surface and subsurface artifacts, consisted of 22

cores and 513 flakes. All stages of lithic reduction are represented at the site, and primary core reduction and secondary reduction and tool manufacture are represented in several discrete activity areas within the site. Lithic materials are available as cobbles from primary and secondary sources within outcrops of fluvial bedrock of the late Cretaceous Laramie Formation and Cretaceous/Paleocene Dawson Formation. Materials from these sources include primary deposits of petrified wood and secondary cobbles of chert, petrified wood, fine-textured orthoquartzite and coarse metaquartzite from bedrock units that crop out close to the Front Range. Two bifacial mano fragments, one unifacial mano, three unifacial mano fragments, and four metate fragments were recorded on the surface. Mano materials were granite, quartzite and sandstone; metate fragments were fine-textured sandstone and orthoquartzite, possibly Lyons sandstone. Eight ceramic sherds were recovered from the surface. Seven small sherds, including one rim sherd, were plain ware, and one was a finely cord-marked body sherd. The plain ware sherds were determined similar to ceramics manufactured by Numic speakers, and the cord-marked sherd was similar to late Plains Woodland or Upper Republican ceramic wares. Feature 1, a large (1.3 m diameter), shallow, rock-filled basin hearth was the only subsurface feature excavated. This feature contained charred goosefoot (*Chenopodium*) and purslane (*Portulaca*) seeds and two pressure flakes. A sample of charcoal from Feature 1 returned a radiocarbon age of 470 ± 70 B.P. 2-sigma cal range A.D. 1321-1631.

Smiley Rockshelter (5EL9). Both Smiley Rockshelter and Buick Camp were excavated by Herbert W. Dick during May and June 1952. Dick left the University of Colorado Museum before he could report this fieldwork, and this task was undertaken by W.R. Wood while he was a visiting professor at CU during the 1970-1971 academic year. Arnold Withers of the University of Denver also excavated at Buick Camp, but this work was never published.

Smiley Rockhelter is a single-component sheltered camp is situated in a northeast facing overhang a short distance east of the tip of Cedar Point, about 19 km (12 mi) northwest of Limon, in eastern Elbert County (W.R. Wood 1971a). Three cultural strata above culturally sterile white sand were recognized. Four rim sherds representing four vessels and 25 body sherds were described from the site. Exterior surfaces of the vessels are cord impressed, with some of the impressions smoothed to near obliteration, and vessel shape is probably globular. Two of the rims are collared, with one being cord roughened and one with six horizontally incised lines around the rim and oblique tool impressions on the lip. Two of the rims are plain and outcurving, one exhibits closely spaced, oblique tool impressions. The two collared rims were compared to Frontier Ware, and the plain flaring rims were compared to Cambridge Ware, both of Upper Republican affiliation (Sigstad 1969). Two small, triangular, side-notched projectile points, one with a basal notch, were also recovered. Other chipped stone artifacts include two end scrapers, one triangular biface, one beveled biface, eight retouched flakes, six utilized flakes, and 55 unmodified flakes, including one of obsidian. One bifacial mano, two bone awls, and two bone beads are the remaining artifacts.

Buick Camp (5EL1). This large, single component open camp is situated on the north rim of Cedar Point overlooking the valley of Beaver Creek (Withers 1949; W.R. Wood 1971a). An area nearly an acre in size is covered with a midden deposit, with ash and artifacts abundant from the surface to a depth of 20-30 cm (8-12 in). Cultural material recovered during the excavation of a 0.9 m (3 ft) wide trench of unspecified length included 31 rim sherds representing at least 24 vessels, and 145 body sherds. All but one of the rim sherds were from collared rim Frontier Ware vessels. The single Cambridge Ware rim was straight, outcurving, and undecorated, with vertical,

obliterated cord-roughened marks on the neck. The Frontier Ware rims are decorated with horizontal or oblique incised lines, some in alternating triangles, or are plain or obliterated cord roughened. The bases of some of the collars are decorated with oblique lines or a line of nodes. Vessels are globular with constricted necks and sloped shoulders. Classifiable projectile points include triangular unnotched (n=5), side-notched (n=8), side- and basally notched (n=5), and corner-notched (n=2). Other chipped stone artifacts include end scrapers (n=12); one graver; one drill; two small triangular bifaces; four large, broad bifaces; seven large, beveled bifaces; retouched flakes (n=34); utilized flakes (n=42); five cores; two choppers; and unmodified flakes (n=112). Two manos (one bifacial and one unifacial), one metate fragment, one hammerstone, one bone awl, and a bone bead complete the artifact assemblage. Apparently very little of the excavated bone was saved, but faunal remains in the collection include *Bison bison*, *Canis lupus* and *Canis* sp., *Mephitis mephitis*, *Terrapene* sp., unidentified bird long bone., and freshwater mussel shell.

During preparation for writing this report, I examined the collections at the University of Denver in an attempt to recover additional information regarding the "evidence suggesting some sort of light shelter" that Withers discovered at Buick and communicated to W.R. Wood (1971a:80). Documentation of the 1949 excavations at the site is minimal (Withers 1949), and consists of a few slides of the site and a plan map of the excavations that does not have a scale. The light structure that Withers apparently discovered is designated "Feature 1" on the plan map, and based on the map and two slides of the structure taken during excavation, the structure is a subcircular basin, 6.5 by 6 map units (probably 0.5 meter) in size, and appears from the slide to be 30-45 cm in depth. The site map indicates that the structure does contain a central hearth, but no postholes or any other associated features are indicated.

W.R. Wood (1971a) considered the ceramic and lithic technologies in the Upper Republican components in both Smiley Shelter and Buick Camp to be virtually identical to other Upper Republican manifestations farther east on the Loess Plains of Kansas and Nebraska, as well as High Plains manifestations in Nebraska, Colorado, and Wyoming. Although there are examples of what W.R. Wood (1971a:74) called "Upper Republican trade sherds" in sites west and south of Cedar Point, he believed that the known distribution of Upper Republican sites in Colorado, including Agate Bluff; Happy Hollow; J. J. Wood's sites in Weld, Logan and Morgan counties; and the Cedar Point sites, represented the western and southern extent of actual Upper Republican exploitation in Colorado.

Hogbacks/Foothills

T-W Diamond Site (5LR200). This single-component open architectural site is situated on top of a ridge in the lower foothills east of the Laramie Range, approximately 5 km (3 mi) north of Livermore, in northeast Larimer County. The site contains 47 stone circles, 17 of which were excavated by the Colorado State University archaeological field school in 1971 (Flayharty and Morris 1974). Sediments at the site are 2.5-46 cm (1-18 inches) thick over bedrock, and cultural material was found between the surface and 15 cm (6 inches) below the surface. The 47 stone circles ranged between 4.3 and 5.8 m (14 and 19 ft) in diameter, with the majority between 4.9 and 5.5 m (16 and 18 ft). The stones used to construct the circles ranged between cobble sized and 4.5-13.5 kg (10-30 lb), and the vast majority were of the same limestone bedrock that underlies the site. Many of the circles had greater concentrations of stones on the northwest side, the direction of the prevailing wind. At least seven of the 17 excavated circles contained central, rock-filled

hearths. Of the 140 ceramic sherds recovered from the site, 139 were from excavations within the stone circle designated Feature 11. These small, brittle sherds represent a single, flat-bottomed vessel with a slightly restricted neck and a plain rim. The surface of the sherds exhibited "some sort of regular indentation" that had been subsequently nearly obliterated by smoothing or polishing prior to firing. The vessel was given a tentative Shoshonean affiliation.

Of the 30 projectile points and point fragments recovered, 14 were classifiable. Eight were small triangular, unnotched points with straight bases (n=7) and concave bases (n=1); four were small points with side notches and straight bases (n=3) and concave bases (n=1), one was a small triangular side- and basally notched point with a slightly concave base; and one was a small, side-notched point with an expanding stem. The number of chipped stone artifacts discussed in the text does not agree with the number presented in a table of artifacts and their provenience, so the numbers used here are those presented in the text. Other chipped stone artifacts included six bifacially flaked scrapers and one unifacially flaked scraper, one oval biface, one spokeshave, 28 utilized flakes, three cores, and 1,055 unmodified flakes. The only other artifact recovered was a fragment of a steatite pipe. All of the charcoal samples submitted for radiocarbon ages were small fragments from the floor fill of stone circles and apparently not associated with the central hearths, which adds to the difficulty of interpreting the results. Three radiocarbon ages were included in the published report, all of which were from samples recovered from 15 cm below the surface: 1550 ± 340 B.P., 2-sigma cal range 357 B.C.-A.D. 1197, is associated with Feature 11 (the feature that contained the ceramics), 930 ± 230 B.P., 2-sigma cal range A.D. 657-1438, from Feature 2, and 780 ± 220 B.P., 2-sigma cal range A.D. 789-1627, from Feature 10. The large sigmas of these ages may account for the disparity between the dates, but these ages may also represent several components. The site was thought by the investigators to have been occupied during the eleventh or twelfth centuries A.D.

Roberts Buffalo Jump (5LR100). This single-component open camp/kill site consists of a bison kill/butchering area, a meat processing area, and a habitation area all within a 25 m (80 ft) radius at the bottom of an 18 m (60 ft) vertical cliff. The site is next to the North Fork of the Cache la Poudre River, in northeast Larimer County (Witkind 1971). The bison apparently were driven from west to east into a draw that acted as a natural drive line that turns northeast and leads to the top of the cliff. At least 18 bison are represented in the faunal assemblage. Seventeen projectile points were recovered from the combined kill/butchering and meat processing areas, with unnotched, side-notched and side- and basally notched forms represented. Other artifacts from this are include five end scrapers, one backed knife, one biface, two shaft smoothers, and nine ceramic sherds from the meat processing area. Two of the sherds conjoin to form a circular object 6.1 cm in diameter, one sherd is from an elongated object, and the remaining sherds are fragments of vessels. All but one of the sherds are plain ware; the exception is fingernail impressed. Bone tools included a radial flesher, a possible scoop, two bone beads, and one bone awl. In addition to the remains of the 18 bison (*Bison bison*), faunal remains included two occurrences of dog or coyote (*Canis* sp, cf. *C. familiaris* or *C. latrans*), and three black bear canine teeth, one from the habitation area and two from the kill/butchering area. Artifacts from the habitation area included 31 sherds that belong to a partially reconstructed, flat-bottomed vessel. This vessel was manufactured from micaceous clay, had an undulating surface, a vertical neck and a slight, somewhat abrupt shoulder below a shallow groove, approximately one-quarter of the vessels height below the rim. This vessel is 26.1 cm high from base to rim. Sixty-six other sherds similar to those described above were also recovered from the habitation area. Eight of these sherds conjoined into a partial vessel rim, and eight fit into a partial vessel base. Either one or both of

these fragments could be part of the partially reconstructed vessel. The 50 remaining sherds do not fit together in a recognizable shape, and 26 of these are fingernail impressed, suggesting the presence of at least two vessels. Thirty-five complete and fragmentary projectile points were recovered from the habitation area. Fifteen were triangular unnotched points (nine with concave bases, five with straight bases, and one broken), four points were side-notched with concave bases, and 15 points were side-notched and basally notched. One small, corner-notched point was also recovered. Other artifacts from the habitation included seven scrapers, two side scrapers, two drills, nine utilized flakes, two river cobble "tanning stones," two bone awls, three metapodial fleshers, and at least six bone beads. Unfortunately, no absolute ages are associated with this site.

Echo Cave (5LR349). This single-component sheltered camp is situated in a small, southeast-facing rockshelter (2.5 m high, 3.5 m across, and 8 m deep) eroded into granite overlooking Sulzer Gulch just west of its confluence with the Big Thompson River, approximately 13 km (8 mi) west of Loveland. Three prehistoric cultural levels were identified as subcomponents (Ba, Bb, and Bc) representing successive occupations of the shelter by the same or closely related cultural traditions. The vertical distribution within the three subcomponents of the diagnostic projectile points and the uniformity of style between the three notched points supports this conclusion. Three of the points were small, triangular, side-notched points with concave bases, two of which have a small basal notch. The fourth point is a complete unnotched point with a concave base. Other chipped stone artifacts include drills, awls, scrapers, flake knives, biface tips, and more than 200 unmodified flakes. A granite flesher was manufactured from local granite, and other lithic materials included chert, jasper, quartzite and obsidian, all of which were thought to be available within a 100 km (60 mi) radius of the site. Previous work at Echo Cave resulted in the recovery of 20 plain ware sherds from a test pit (Yelm 1935, cited in Brunswig 1990b). These sherds were curated at the museum at Rocky Mountain National Park; however, a later search could not locate these artifacts. These sherds were dark red on the exterior surface, gray on the interior surface, and both surfaces were roughly scraped. Vessel shape was not indicated, but the lip was described as irregular, thin, and rounded. The temper was mica and angular gravel, and sherds were 9-12 mm thick. Faunal remains recovered represented mule deer, bison, rabbit, and unidentified bird. Macrobotanical remains included charred pigweed seeds recovered via flotation from Feature 1 hearth matrix, and prickly pear, wild plum, wax currant, and chokecherry recovered from the screen. The cultural material from Echo Cave was interpreted as representing a Middle Ceramic occupation by either Intermountain tradition or Upper Republican people. A radiocarbon age of 670 ± 80 B.P., 2-sigma cal range A.D. 1216-1427, was returned for Feature 3 (Brunswig personal communication 1999), after publication of the report (Brunswig 1990b).

Graeber Cave (5JF8). This single-component sheltered camp is situated in a small, south-facing rockshelter in the Idaho Springs Formation, overlooking North Turkey Creek, 1.6 km (1 mi) northwest of Tiny Town in west-central Jefferson County (Nelson and Graeber 1966). More than 100 sherds (21 rim sherds) from a flat bottomed, "flower pot" or truncated cone shaped vessel were recovered from excavations. This vessel was classified as Intermountain Ware, with a possible Shoshoni affiliation. The vessel was manufactured from micaceous clay containing particles of granite, using a patch construction technique, and both the inner and outer surfaces were scraped using a "broom-like brush" that left striations on the surfaces. The vessel is 13.3 cm (5.25 inches) high, 28.6 cm (11.25 inches) in diameter at the mouth, and 12.7 cm (5 inches) in diameter at the base. The base is joined to the walls with a prominent flange. Chipped stone artifacts from the site include a small, corner-notched projectile point with a straight stem and serrated blade edges, a small, triangular, unnotched projectile point, two projectile point

fragments, an end scraper, and two retouched flakes. Faunal remains included bird, rabbit, possible squirrel, a large mammal either elk or bison, and a *Canis* sp. mandible. A sample of charcoal from a slab-lined hearth believed to be associated with the same component that produced the pottery returned a radiocarbon age of 630 ± 75 B.P., 2-sigma cal range A.D. 1270-1436 (Benedict 1989; Nelson and Graeber 1984). A body sherd from the vessel returned a thermoluminescence date of less than 100 years. A possible explanation for this anomalously late date could be the heating of the shallowly buried sherd by the fires of people using the cave as a picnic spot. An alternative explanation is that the hearth and the sherds may belong to separate components (Benedict 1989).

Ken-Caryl Sites. The presence of Middle Ceramic components at the Ken-Caryl Ranch is based on the presence of small, side-notched projectile points at four sites and radiocarbon ages at one site. No ceramics attributed to Middle Ceramic types were recovered in the area. Side-notched projectile points were documented at Bradford Houses II (n=12) and III (n=1), and one side-notched point was recovered from the Anniversary site (5JF209). The Crescent site has three absolute ages that fall within the Middle Ceramic period (Adkins 1997; Stone and Mendoza 1994). Radiocarbon ages of 550 ± 70 B.P., 2-sigma cal range A.D. 1291-1476, for Grid D4, Level 4; and 690 ± 70 B.P., 2-sigma cal range A.D. 1216-1412, for Grid G7, Level 4, are presented in Adkins' (1997) summary of the CAS excavations at the site. This document does not mention the presence of a Middle Ceramic component, nor does it provide a summary of the material culture or an interpretation. Adkins (1997) does not provide any context for the radiocarbon ages beyond excavation grid and arbitrary level. A radiocarbon age of 480 ± 70 B.P., 2-sigma cal range A.D. 1326-1627 was returned for a hearth located within a cluster of hearths in Unit S2E4, but no additional information is provided (Stone and Mendoza 1994).

Dancing Pants Shelter (5DA29). No diagnostic cultural material was recovered from this component, but one Middle Ceramic radiocarbon age of 570 ± 90 B.P., 2-sigma cal range A.D. 1281-1478 was returned for a sample of charcoal from Feature 3. Floral remains recovered from this hearth include pigweed, grass, ball cactus, raspberry, dock, buffaloberry, and spiderwort, as well as pine and Douglas fir charcoal. No diagnostic artifacts were recovered from this component (Liestman and Kranzush 1987).

Mountains

Murray Site (5BL65). A radiocarbon age of 670 ± 150 B.P., 2-sigma cal range A.D. 1032-1611 and two small, triangular points with narrow, deep side notches and unknown base morphology were recovered from Pit 4 in this extensive alpine game drive system (Benedict 1975b). This is evidence that the system was reused by an unknown culture during the Middle Ceramic period. This site is described in greater detail in the Early Ceramic section above.

Old Man Mountain (5LR12). This site is situated on and around a conical granite knob west of Estes Park, in southwestern Larimer County (Benedict 1985b; Husted 1964). The uninterrupted views of the surrounding mountains and the broad valley of Estes Park below, the relative unsuitability of the location as a campsite, and the amount and nature of the material culture found on and around the mountain, as well as ethnographic comparisons and actual ethnohistorical information of this particular site has led to the mountain being interpreted as a ceremonial/vision quest site. The material culture and function of this site are discussed in detail in Chapter 7. In addition to the Protohistoric component at the site, artifacts associated with Early and Middle

Ceramic components are also present, although the provenience of most of the material is either somewhat general or unknown.

Several discrete artifact concentrations were identified around Old Man Mountain; however, the majority of the diagnostic ceramics that are still present in collections at the Rocky Mountain National Park Museum were collected by park employees both from the surface and from a single excavated pit in the early 1930s. Unfortunately, the exact provenience of this area is unknown. This area was designated Locality A in Benedict (1985b). Ceramics from Locality A included cord-marked Woodland types, possibly Fremont gray ware, fingernail- and fingertip-indented Ute wares and Intermountain tradition ceramics, as well as several types of plain ware that were not assigned a cultural affiliation. Fingertip-impressed and plain wares were also found at other localities on the mountain, as well as a rim sherd from a carved steatite vessel. Sherds from vessels manufactured in the Southwest were also present, with one sherd from an Anasazi Pueblo II/Pueblo III corrugated vessel (A.D. 950-1250), and one sherd of Pecos Polychrome (A.D. 1650-1725). Benedict's (1985b) Type H fingertip-impressed sherds were originally identified by Husted (1964) as Indented Blind Corrugated, which Kidder (1936, in Benedict 1985b) dates to A.D. 1475-1600. Benedict asserts that Type H sherds fall within the range of variation of Uncompagre Brown Ware, a ceramic type attributed to the Ute (Buckles 1971). Eight sherds from a steatite bowl were found in association with a grooved maul, a milling slab of Lyons sandstone and brown ware sherds in a surface scatter of artifacts at Beaver Point, 1.3 km south of Old Man Mountain. Other artifacts from the mountain include small, corner- and side-notched projectile points, obsidian flakes, both utilized and nonutilized, and ground stone, including a possible paint palette. Many of these artifacts, especially the pottery, were hypothesized to represent offerings or the containers for offerings left on the mountain, and the artifact concentrations are thought to represent prayer stations where individuals stopped to conduct ritual activities on their way to the summit of the mountain where they would fast in the hopes of obtaining visions or powers. Stream-rounded boulder- and cobble-sized manuports were found in several localities associated with artifact scatters. Some of these stones exhibit evidence of being burned, and could have served as stones used to heat sweat lodges. The larger stream rounded stones, some of which are located more than 170-180 vertical meters above the flood plain of Fall River, are hypothesized as being transported to the mountain as part of a vision quest ritual demonstrating dedication and seriousness of purpose. Based on ethnographic comparison, material culture, and different dating methods, Benedict (1985b) suggests that Old Man Mountain has been a sacred place for Native Americans of several different cultural traditions since at least 3000 B.P. Benedict (1985b:32) feels that the particulars of the site fit a composite model reconstructed from ethnographic accounts of the vision quest.

Middle Ceramic Burials

Plains

Peavy Rockshelter Burial (5LO1). Two burials are reported for this site (J. J. Wood 1967). Burial 1 is the primary flexed interment of an adult male, buried on his right side and back (original position was thought to have been on his right side), oriented east/west. The skull is in a vertical position and is facing east. Accompaniments included an unmodified sandstone slab on the left arm, and one small laterally notched projectile point. The skeleton was somewhat poorly preserved, making age and sex determinations ambiguous. Although there are no absolute ages associated directly with the burial, it is stratigraphically associated with the primary occupation of

the site, which contained obliterated cord-marked sherds from globular pots with constricted necks and flaring rims, side-notched and unnotched projectile points, and an associated radiocarbon age of 810 ± 125 B.P., 2-sigma cal range A.D. 996-1405. Burial 2 is the primary flexed interment of an adult female of advanced age, buried on her right side, oriented north-northeast/south-southwest. The skull is fragmented and scattered, but the position of the in situ parietal bone suggests that she was facing roughly west. The cranial and upper thoracic area of the body were covered with eight to 10 unmodified sandstone slabs. Accompaniments included a handstone and a biface. Based on the origin of the pit at the top of the Middle Ceramic occupation level, the interment of Burial 2 was thought to postdate the primary Middle Ceramic occupation, including Burial 1.

Chubbuck-Oman Burial (5CH3). This burial is actually within the Arkansas River drainage, within a few miles of the drainage divide with the South Platte River. This site is interesting and needs to be discussed here because of the paucity of burials that date to the Middle Ceramic period in the eastern half of the state. The burial is a primary, semiflexed interment of an adult female approximately 22 years of age, buried on her left side with her torso rotated chest down, oriented southeast/northwest (Tipton 1967). Although no culturally diagnostic artifacts were found with the burial, it is interesting that the recovered grave goods consisted of 42 *Olivella* shell beads and an *Unio* (cf. *Lampsilis*) shell pendant with bilateral drill holes similar to those found with burials given a Woodland cultural affiliation elsewhere in the state. Ten of the *Olivella* beads and the *Unio* (cf. *Lampsilis*) pendant were found in the oral cavity, also similar to the pattern observed in other Woodland burials. Two runs on the same sample of bone taken from the skeleton returned radiocarbon ages of 400 ± 95 B.P., 2-sigma cal range A.D. 1398-1953 and 420 ± 80 B.P., 2-sigma cal range A.D. 1400-1654. These ages were not statistically significant, and were averaged to 412 ± 63 B.P., 2-sigma cal range A.D. 1410-1646. This age places the burial in the late Middle Ceramic period.

Evidence of Middle Ceramic Horticulture

Plains

Agate Bluff Site I (5WL1478). One kernel of Dent corn was recovered from this site at a depth of 1.4 m (4.5 ft) below the surface (Irwin and Irwin 1957). When compared with the stratigraphic profiles of the excavations, this depth would almost certainly put this single kernel in stratigraphic Level 3, very close to bedrock. This occurrence of corn was associated with the Upper Republican component at this site by the authors, owing to the overwhelming majority of diagnostic cultural material associated with the Upper Republican component. The mixed association of both Upper Republican and Woodland components within the two cultural levels, and the depth at which the corn was recovered, would indicate a more problematic context than was suggested in the original report. This does not exclude the possibility that the corn could be associated with the Woodland component. The best that could be said is that the context for this single kernel is problematic.

Direct dating of macrobotanical remains is now possible using AMS radiocarbon dating. This could potentially be an important tool that would allow the determination of the age of corn in prehistoric contexts, because the macrobotanical remains of corn (corn kernels, cobs, or stalks) from sites in Colorado are not from well-dated contexts. Horticulture is discussed at greater length below in the Research Questions section.

Middle Ceramic Habitation Structures

Plains

Hilltop Site (5WL1849). This multicomponent open camp/architectural site situated (not surprisingly) on a hilltop consists of two structures, a circular, low stone wall 4 m in diameter with a shallow center depression (Feature 1) and a stone circle 2 m in diameter (Feature 2). The wall of Feature 1 ranges between 20 and 30 cm in height. A radiocarbon age of 700 ± 70 B.P., 2-sigma cal range A.D. 1213-1410, is associated with a stratigraphic unit that passes beneath the stones that make up Feature 1, indicating that the construction of Feature 1 postdates 700 B.P.

Buick Camp (5EL1). In addition to the information contained in the report on Buick Camp (W.R. Wood 1971a), I examined the collections at the University of Denver in an attempt to recover additional information regarding the "evidence suggesting some sort of light shelter" that Withers discovered at Buick and communicated to W.R. Wood (1971a:80). Documentation of the 1949 excavations at the site is minimal (Withers 1949), and consists of a few slides of the site and a plan map of the excavations that does not have a scale. The light structure to which Withers referred is designated "Feature 1" on the plan map, and based on the map and two slides of the structure taken during excavation, the structure is a subcircular basin, 6.5 by 6 map units (probably each 0.5 meter) in size, and appears from the slide to be 30-45 cm in depth. The structure does contain a central hearth as indicated on the site map, but no postholes or other associated features are indicated.

Hogbacks/Foothills

T-W Diamond (5LR200). The site contains 47 stone circles, 17 of which were excavated by the Colorado State University archaeological field school in 1971 (Flayharty and Morris 1974). Sediments at the site are 2.5-46 cm (1-18 inches) thick over bedrock, and cultural material was found between the surface and 15 cm (6 inches) below the surface. The 47 stone circles ranged between 4.3 and 5.8 m (14 and 19 ft) in diameter, with the majority between 4.9 and 5.5 m (16 and 18 ft). The stones used to construct the circles ranged between cobble sized and 4.5-13.5 kg (10-30 lb), and the vast majority were of the same limestone bedrock that underlies the site. Many of the circles had greater concentrations of stones on the northwest side, the direction of the prevailing wind. At least seven of the 17 excavated circles contained central, rock-filled hearths.

THEORETICAL CONSIDERATIONS

Research Topics

The following discussion incorporates the known information regarding Early and Middle Ceramic components into the theoretical topics of chronology, settlement, subsistence, technology, paleoenvironment, and paleodemography, some of which were presented in Chapter 3. A discussion of the information presented above in the Burials section is also presented. Following these sections is a consideration of the research questions that were presented in the earlier prehistoric contexts for the plains (Eighmy 1984) and the mountains (Guthrie et al. 1984). Unlike the more specific research questions presented for the Archaic stage in the previous prehistoric contexts, many of the questions presented for the Early and Middle Ceramic periods are relatively

general, and the information is contained in the discussions of the topics within the Theoretical Considerations section below. To avoid repetition, the reader is referred to the appropriate subsection if the subject has already been addressed.

Chronology

In the previous prehistoric context for the plains of northeastern Colorado (Eighmy 1984), the Early Ceramic period was defined temporally as spanning the first millennium of the Christian era, A.D. 1-1000, and was defined culturally and technologically by the presence of cord-marked ceramics and the appearance of small, corner-notched arrow points that eventually succeeded larger, corner-notched dart points. In the previous prehistoric context for the mountains (Guthrie et al. 1984), possible occupation in the mountains by people affiliated with Formative stage cultures (Woodland, Upper Republican, Anasazi, and Fremont) outside the mountains was discussed and proposed to have occurred between A.D. 500 and 1300. The Middle Ceramic period on the plains of northeastern Colorado dated from A.D. 1000-1550, and was defined by the presence of ceramics diagnostic of the Upper Republican phase or Intermountain tradition ceramics, and small, triangular unnotched and side-notched arrow points. The Late Prehistoric period in the mountains, ca. A.D. 1300-1600, was the first period of the Protohistoric/Historic stage and was defined as the "post Formative Archaic Stage" (Guthrie et al. 1984:45). This period was defined by the presence of small, side-notched and some corner-notched points that are indicative of the introduction of the bow and arrow. The Ute/Shoshone period, which extended from ca. A.D. 1600 into the 1800s, was the second period of the Protohistoric/Historic stage.

Cultural definitions of the Early and Middle Ceramic periods on the plains as presented in this document are not significantly different from those presented by Eighmy (1984). The timing of these periods has been slightly modified to reflect the integration of additional information. As pointed out in the chronology of the Archaic stage above, the transitions between cultural evolutionary stages or between smaller period divisions do not actually occur in the artificially serial manner presented by archaeologists; these temporal units are conventions that allow us to organize a disorderly sequence of events. The earliest radiocarbon ages that have been attributed to the Early Ceramic period are from burials: the Hutcheson site 1805 ± 105 B.P., 2-sigma cal range 16 B.C.-A.D. 530, the Michaud A site, 1800 ± 110 B.P., 2-sigma cal range 36 B.C.-A.D. 535, and the Kerbs-Klein site, 1780+130,-150, 2-sigma cal range 42 B.C.-A.D. 556. The Kerbs-Klein and Hutcheson sites were isolated burial sites given Woodland affiliations based on their similarity to the Woodland burial pattern observed elsewhere, and not on the presence of culturally diagnostic artifacts. The Michaud A burial was thought to be associated with a buried Woodland occupation level above the burial pit; however, the small, corner-notched arrow points and cord-marked ceramics and a lack of dart points suggest that the burial may predate the occupation level represented by these artifacts. Although possibly equivocal, these radiocarbon ages and material culture define the arrival in northeastern Colorado of the Early Ceramic period/Plains Woodland culture ca. 1800-1750 B.P., or a calibrated date in the mid-third century A.D., which is consistent with the conclusions of others (e.g. Butler 1986; Brunswig 1996). An undecorated brown ware sherd and the tip from a "Woodland-looking" projectile point from a component with an incongruously early associated radiocarbon age of 2140 ± 200 B.P., 2-sigma cal range 772 B.C.-A.D. 329 at the Indian Mountain site, 5BL876, may be one of the earliest dates associated with ceramics in the Central Plains (Cassells and Farrington 1986). This material was recovered from a very shallowly buried site that contained other features with radiocarbon ages that fell into the accepted temporal range of the Early Ceramic period. Even if this single sherd is associated with

this anomalously early date, there is no evidence that this component represents the arrival of ceramic technology that was integrated into the culture of the indigenous people of Colorado at this time, and so this occurrence should not be used to define the beginning of the Early Ceramic period.

The partitioning of the Early and Middle Ceramic periods on the High Plains of Colorado is based on the appearance of material culture related to the Central Plains tradition, which seems to replace Woodland material culture in the archaeological record. The earliest definitive Upper Republican components in Colorado with associated dates are from the Friehauf site in Morgan County. This site contains an Upper Republican component associated with a buried A horizon in a stabilized sand dune. Soil humates from this horizon returned a radiocarbon age of 860 B.P., 2-sigma cal range A.D. 1010-1298. Other early Upper Republican sites include Peavy Rockshelter, 810 B.P., 2-sigma cal range A.D. 996-1405, and Happy Hollow Rockshelter, 780 B.P., 2-sigma cal range A.D. 1036-1396. These radiocarbon ages cluster around 800 B.P., with calibrated dates clustering around a hundred years later, in the mid-thirteenth century A.D. The latest transitional Early Ceramic dates are from the Rock Creek site, 850 B.P., 2-sigma cal range A.D. 1025-1291, and the Bayou Gulch site, 850 B.P., 2-sigma cal range A.D. 1041-1245. These radiocarbon ages cluster around 850 B.P., and the calibrated dates cluster in the early to middle thirteenth century. These dates would seem to indicate a relatively rapid transition between the Early and Middle Ceramic periods. However, these dates only reflect those components that were designated as Early Ceramic, and do not reflect the later radiocarbon ages from multicomponent Early Ceramic sites in the Colorado Piedmont that were attributed to Upper Republican components based on the date alone, without corroborating material evidence. Other data not used to determine the Early/Middle Ceramic transition are components at Early Ceramic sites that contain late dates but were not assigned any cultural affiliation because they do not contain diagnostic artifacts, nor do the associated ages fall within the range of ages traditionally accepted for the Early Ceramic period. These somewhat problematic dates include two ages from hearths attributed to the Middle Ceramic period at Box Elder-Tate Hamlet: 760 B.P., 2-sigma cal range A.D. 1036-1405, from a feature that contained a corner-notched point, and 630 B.P., 2-sigma cal range A.D. 1238-1444, from a feature that contained both Early Ceramic and Middle Ceramic period sherds. Other late dates include 640 B.P., 2-sigma cal range A.D. 1279-1421 from Feature 21 at Bayou Gulch, a hearth that was not associated with any diagnostic artifacts; 620 B.P., A.D. 1285-1447 from a hearth at Kinney Creek without any associated diagnostic cultural material; and two stratigraphic ages of 650 ± 110 B.P., 2-sigma cal range A.D. 1191-1449 and 780 ± 90 B.P., 2-sigma cal range A.D. 1036-1396 from the Rock Creek site that were not assigned to any component. The context of some of these dates suggests that the basic "Woodland" culture pattern among the indigenous people of the Piedmont along the Front Range may persist even beyond A.D. 1150 as suggested above.

The Middle Ceramic period ends with the transition into the Protohistoric period, which for our purposes begins on the Central Plains with Coronado's entrada in 1540. Even though Coronado's expedition did not make it as far north as the Platte River Basin, his presence does demarcate the period of actual presence of Europeans on the plains.

There are fewer absolute ages from sites in the mountains of the Platte River Basin, which makes the determination of the beginning of this period difficult. Previous work uses a date of A.D. 500 for the beginning of the Early Ceramic period (Guthrie et al. 1984). Absolute ages dating to the beginning of this period and associated with diagnostic artifacts are few, but a

stratigraphic age of 1600 ± 60 B.P., 2-sigma cal range A.D. 339-607 was returned from a cultural horizon containing a small, corner-notched point and a cord-marked sherd from 5CC389, in northeast Clear Creek County (Hand and Pearce 1990). An ending date for the Archaic stage in the mountains of A.D. 150 has been adopted by Tate (Chapter 5, this volume), which is convenient in its correspondence to the chronology established on the plains. However, this date may be somewhat early for the mountains based on the information available at present. At the Coney Lake site, Benedict (1990) describes a feature with an associated radiocarbon age of 1585 ± 90 B.P., 2-sigma cal range A.D. 254-653, that contained two Late Archaic Coney Lake corner-notched dart points. This information suggests that Archaic technologies such as the atlatl may have persisted without the presence of the bow and arrow for a slightly longer period of time in the mountains than seems to be in evidence on the plains.

Settlement

As was discussed in Settlement in Chapter 5, there are many difficulties in determining settlement patterns owing to bias in the selection of areas to be surveyed based on both the goals and requirements of the Section 106 process, and the constraints of Cultural Resource Management. Because the vast majority of survey work in the Platte River Basin is the result of CRM projects, these surveys are based on project-specific impacts, the vagaries of land ownership, and the nonrandom or intuitive selection of survey areas based on predicted site locations. These constraints, as well as the inability to make temporal assignments for many sites due to lack of diagnostic artifacts, have created difficulties in determining settlement patterns. This is not to say that useful predictive models can not be derived from the information gathered by these methods, but because of the constraints inherent in project-specific CRM surveys, the models are limited. Because of the lack of temporal data for many of the more ephemeral, short-term occupations and limited activity loci within the settlement pattern, there is a bias in settlement studies toward the larger, more intensively occupied habitation sites. Early Ceramic settlement patterns in the Platte River Basin are similar to those observed for the Archaic stage; in fact, the majority of Archaic (particularly Late Archaic) habitation sites also contain Early Ceramic components. Because of this high degree of spatial correlation between Early Ceramic and Archaic components, much of the general comments in Chapter 5 regarding Archaic settlement patterns also apply to Early Ceramic components.

On the plains, as in the other subareas, the single most important environmental variable for the placement of longer term campsites is distance to water, with open camps located on terraces or on ridgetops and hilltops overlooking the valleys of permanent and intermittent streams. Sheltered camps on the plains often contain Early Ceramic components, although many of the well-documented sheltered camps on the plains seem to contain smaller Early Ceramic components than either those of the previous Archaic stage (e.g., Dipper Gap, Wilbur Thomas) or the subsequent Middle Ceramic period (e.g., Happy Hollow, Agate Bluff I-III sites, McEndaffer Rockshelter). Several of the Middle Ceramic sites on the edge of the High Plains Escarpment are apparently Upper Republican single-component sites or contain only trace evidence of earlier occupations (Peavy Rockshelter, Smiley Shelter, Buick Camp). This pattern is quite different to that seen in the Piedmont along the Front Range and in the hogbacks/foothills, where most campsites were most intensively occupied during the Early Ceramic period but may also contain substantial Archaic components. Although the number of sites in the Middle Ceramic period sample may still be too small to make absolute statements in support of these impressions, this apparent difference in settlement pattern trends between Upper Republican people on the edge of

the High Plains and Early Ceramic people closer to the mountains in the Piedmont and in the hogbacks/foothills deserves further analysis. Architectural sites are rare, with pit structures (Box Elder-Tate, possibly Bayou Gulch) and a lean-to (Three O'Clock Shelter) known from the plains.

As noted in Chapter 5, sheltered camps are much more common within the hogbacks/foothills subarea than on the plains, and the nature of Early Ceramic components are indicative of much more intensive occupations at sites in the hogbacks/foothills. These occupations are thought to represent winter base camps, due to the amount and types of cultural material, the presence of what are interpreted as habitation structures at several sites, and the orientation of most of the sheltered sites to the south. Scott (1973) presents a preliminary settlement pattern model for what he designated Colorado Plains Woodland sites in the northern part of the state. He used the presence of cord-marked ceramics that could be identified as Colorado Plains Woodland as his principal criterion. At that time, 42 sites fit this criterion. The majority of rockshelters (n=13) faced south or southwest (n=10), which reinforces the hypothesis that these sites represent winter occupations. The number and variety of habitation structures in the hogbacks/foothills is much greater than in the plains, and in the mountains there are no recorded examples of Late Prehistoric habitation structures.

Determining settlement patterns within the mountains subarea is made difficult by the small number of excavated sites and low number of dates from Late Prehistoric stage components. The sample of sites dating to this stage that have been excavated is biased due to research interests in a particular area (i.e., Benedict's work in the Indian Peaks and surrounding areas) or by the nature of CRM projects in this area and the ability of investigators to avoid significant sites. Based on his work in the Front Range, Benedict (1992) has proposed a grand circuit model for the settlement system of the Early Ceramic Hogback complex, a counter clockwise movement by populations who wintered along the eastern margin of the northern Front Range and moved north and west across the Medicine Bow Mountains, down through North and Middle Park during the summer, finally returning east in the fall to the crest of the Front Range for communal hunts utilizing the game drive systems, and then on to the winter camps in the hogback valleys. The distribution of lithic raw materials from various sources in North Park, Middle Park, and the Front Range supports this hypothesized movement of people. Recent work by Benedict (1999) supports the hypothesis that people were attracted to the crest of the Front Range by the presence of large game, and that fluctuations in human population density (as measured by the relative frequency of radiocarbon ages) closely parallels the lichen snow kill curve, with decreases in human occupation of the mountains occurring at periods of extended snow cover resulting in lichen kills, and increases during periods of lichen recolonization. The foraging ability of game animals such as bighorn, deer, and elk are directly affected by the depth, lateral extent and persistence of snow cover. During periods of increased snow cover, populations of game animals are stressed, which results in decreases in population due to starvation, low fertility, and low birth weights (Benedict 1999:8). The extended snow cover is thought to have been the result of an increase in springtime upslope snowstorms.

The relatively high frequency of lithic material at sites on the Ken-Caryl Ranch derived from the Trout Creek jasper quarry, close to the southwest margin of South Park, may indicate that a transhumant settlement system similar to that described above for the northern Front Range may have been used on the southern Front Range, with the prehistoric inhabitants of the hogback valleys southwest of Denver moving up the South Platte River into South Park as part of their seasonal round (Johnson et al. 1997). More sites of this hypothesized southern Front Range

pattern of transhumance will need to be documented to determine the existence of this hypothesized system.

Small, corner-notched projectile points are widespread in the Platte River Basin, and indeed throughout the West, in sites dating to the Late Prehistoric, and so their utility by themselves as a cultural marker of the "Plains Woodland Culture" or Woodland-identified people is limited as one moves farther from the Central Plains. Benedict (1975a, 1975b) disagrees with the equation of cord-marked ceramics with the presence of Plains Woodland people in the mountains, and trade of ceramics to aceramic, mountain-oriented groups is a realistic source for some of the plains ceramics found in the mountains. However, it is improbable that all of the plains ceramics found in the mountains represent trade ware. Utilization of the mountain parks by plains groups, or by mountain-oriented people with connections to the plains such as the Hogback complex, could also explain the presence of cord-marked ceramics, which have been found at several sites in the mountains and mountains parks. Cord-marked ceramics were found at two sites in North Park (Lischka et al. 1983) and cord-marked "Woodland" ceramics were collected from sites in South Park (Nelson 1969), at Old Man Mountain outside Estes Park (Benedict 1985b), and at 5CC389 (Hand and Pearce 1990). Cord-marked ceramics identified as Plains Woodland were found at the Caribou Lake site, on the Continental Divide just outside the Platte River Basin, as well as from six sites reported from within and around Rocky Mountain National Park (Benedict 1985a). The cord-marked sherds from the Caribou Lake site are tempered with materials from a source somewhere in the Precambrian core of the Rocky Mountains (Benedict 1985a:138-139), although this would not rule out secondary sources of this material outside the mountains. Plains Woodland cord-marked ceramics are rare west of the Continental Divide; one known exception is site 5GA1 in the vicinity of the Table Mountain jasper quarry in Middle Park (Benedict 1985a:144).

Settlement patterns among Middle Ceramic occupations in the Platte River Basin are difficult to ascertain due to the relative paucity of components; however, the coincidence of Middle Ceramic period components with Early Ceramic components (and in many cases with Archaic components) indicates an overall similarity in site selection criteria through time, which in turn indicates continuity in economy, especially in the western Colorado Piedmont. Another problem with determining settlement patterns of Middle Ceramic peoples is that based on the little information available at present, projectile point styles are more numerous and even less culturally and temporally diagnostic than during the previous Early Ceramic period. Although it may be indicative of mixed components, the archaeological record suggests that the use of side-notched points of various styles, unnotched points, and corner-notched points overlapped significantly both temporally and spatially around the transition between the Early and Middle Ceramic, and may have been used contemporaneously by the same groups. Side-notched points are also known to occur in Protohistoric components (e.g., Kehoe 1966). A corner-notched point was recovered from a feature with an associated age of 760 B.P. at Box Elder-Tate Hamlet (Tucker et al. 1992), and an age of 810 B.P. was associated with the Upper Republican component at Peavy Rockshelter (Wood 1967). Side-notched points conforming to several different styles were recovered from the T-W Diamond site, which also had radiocarbon ages ranging between 1550 and 780 B.P. Based on the few dated examples of side-notched points from the eastern part of the state (Benedict 1975a; Brunswig 1990a; Flayharty and Morris 1974; Gilmore 1991b; Steege 1967; Wood 1967), variation in style within the collection of side-notched points within components is relatively great, and distinguishing between unnotched points as a finished artifact and projectile point preforms is difficult at best and probably impossible when dealing with broken artifacts. Because of the above

reasons, in the absence of indisputable Middle Ceramic pottery and/or absolute dates, distinguishing Middle Ceramic components from those of the late Early Ceramic period or Protohistoric period based on projectile point styles alone cannot be done with complete confidence.

As indicated above, the only typically Upper Republican components in the Platte River Basin are clustered close to the boundary between the Colorado Piedmont and the High Plains. Counter to early theories regarding the function of these sites as temporary camps (J. J. Wood 1967; W.R. Wood 1971), these components probably represent actual movement of Upper Republican people who occupied the area more or less permanently (Roper 1990; W.R. Wood 1990). This hypothesis is based on the number and types of artifacts represented and the thickness of cultural deposits at these sites, which compares to the more intensively occupied Early Ceramic sites along the foot of the Front Range. This conclusion is supported by the evidence suggesting a local origin for much if not all of the ceramics at Smiley Shelter, where 40 percent of the sampled sherds contained crushed Pikes Peak granite or Boulder granodiorite as temper, available in primary sources in the Front Range or in secondary deposits on the plains (Ellwood and Parker 1995).

The small size and low number of Middle Ceramic components, relative to the number of larger, intensively occupied Early Ceramic sites in the hogbacks/foothills or Colorado Piedmont, suggests not only a smaller overall population (see Paleodemography, below), but also may indicate a more mobile, less logistically based population with a subsistence and settlement system closer to the forager end of the forager-collector continuum (Binford 1980). Brunswig (1996:433) suggests that this is in fact the case; and although he concedes that there is insufficient information regarding Late Archaic and Middle Ceramic sites to make definitive inferences, the nature of the artifact assemblages and the ephemeral nature of the sites are broadly consistent with an emphasis on foraging strategies during these periods. This pattern is more consistent with sites in the hogbacks/foothills and Colorado Piedmont, and some of the Upper Republican sites on the High Plains escarpment suggest function as residential bases in a collector strategy, given the amount of cultural material and variety of artifact classes found at some of these sites (see Roper 1990), and the presence of what is apparently an excavated habitation structure at Buick Camp (W.R. Wood 1971a; Withers 1949). This adaptation may have been in response to less reliable and sparser resources available during periods of climatic deterioration (see Paleoenvironment, below). Evidence for Early Ceramic peoples' utilization of a strategy closer to the collector end of the continuum is represented by the amount and nature of cultural debris at many sites, the variety of features, including several forms of habitation structures, greater reliance of a expedient core/flake tool technology (see Technology, below). Testing this model regarding differences between Late Archaic, Early Ceramic and Middle economic strategies will require the collection of additional data.

Subsistence

A wide range of plants and animals was utilized during the Early and Middle Ceramic periods. Although awareness of the importance of subsistence data has increased over the past 20 years, problems of preservation affect recovery of faunal and floral remains, and lack of understanding of available flotation methods for the recovery of macrobotanical remains resulted in a lack of much evidence of plant use in sites that were excavated prior to the late 1970s. Even where appropriate methods are used, problems in preservation can result in a lack of subsistence

data at some sites. As pointed out in Chapter 5, subsistence data from all prehistoric sites is relatively sparse, but more widespread use of established techniques such as washing ground stone for pollen, and the use of more recently developed techniques such as protein residue analysis of flaked and ground stone artifacts and sediments is resulting in greater understanding of how these tools were used and what materials were being processed.

No documented Early Ceramic kill sites representing multiple animals or game drive systems are known on the plains or in the hogbacks/foothills. The only kill site from the Middle Ceramic period is Roberts Buffalo Jump, located in the northern hogbacks/foothills. Intermountain ceramics found at this otherwise undated site suggests that the hunters were Shoshonean. This site seems to be the only documented Late Prehistoric communal bison kill on the plains of eastern Colorado, but several bison kill sites dating to this period have been documented in Wyoming (Frison 1991a), although the animals that were most often hunted by Shoshonean people were species other than bison. Benedict (1975b, 1975c, 1992, 1996) has documented many game drive systems above timberline that have been used, modified, and reused from the Early Archaic through the Early and Middle Ceramic periods. Several of these sites may have required the participation of up to 60-70 individuals to fill all of the associated blinds. However, it is unlikely that all of the blinds would need to be occupied for a successful hunt to take place. Based on the configuration of the drive systems and known behavior of herd animals, as well as a few faunal remains, the drive systems on rocky ridges near steep, rocky slopes were probably used to procure bighorn, and drive systems close to the forest margin may have been used for deer and elk (Benedict 1992:7).

Information regarding faunal assemblages have been reported for more Late Prehistoric sites than have botanical remains, due to the more specialized recovery methods necessary for reliable recovery of botanical remains, and because many sites were excavated at a time when these specialized methods were not widely known. In faunal assemblages from Early Ceramic components on the plains, bison was reported as the dominant species at four sites, and was reported at nine sites, making it the most common species. Pronghorn was reported as codominant with bison at two sites, and was reported at seven sites. Other medium to large species were (in order of frequency of occurrence) deer, coyote/canid, elk, bighorn, bear, and mountain lion. The most common small animals were prairie dog and rabbit, which occurred at seven sites, with jack rabbit, reptile, birds, fox, racoon, badger, marmot, weasel, and a variety of small rodents (most thought to be intrusive) also present. Prairie dog was described as probably representing an intrusive species at some of the earlier excavations, but the presence of burned prairie dog bone at the Senac site (O'Neil et al. 1988) suggests that these animals were cooked and eaten there, and by extension at other sites as well. Objectively, prairie dogs as a food source would seem to be a desirable resource, offering several advantages. They are social rodents that live in large colonies at a location that is predictable from year to year, and are relatively easy to trap, snare, or hunt. Although burned bone is one of the criteria cited as representing evidence of an animal being cooked and eaten, other cooking methods such as boiling may not have an observable effect on bone unless the bone was subsequently discarded in a hearth. The presence of unburned bone, especially that of small animals, may not necessarily represent postdepositional intrusion. One of the striking characteristics of Early Ceramic faunal assemblages is the highly fragmented nature of most if not all of the bone recovered. The amount of highly fragmented bone at most sites has been interpreted as representing marrow extraction and bone grease production.

Faunal assemblages from Early Ceramic sites in the hogbacks/foothills subarea differ somewhat from those on the plains. Bison is still common, reported from six sites and dominant at one of those, but deer are also reported from six sites, and was the dominant species at four of them. Other patterns are what one might expect, with elk and bighorn more common than at sites on the plains, and pronghorn less common. Canid/wolf occurred at four sites, and prairie dog and rabbit are still the most common small animals. With the addition of skunk, bobcat, beaver, and amphibian, the list of species represented is similar to that of the plains sites.

The relative number of species of animals utilized during the Middle Ceramic period is similar to those of the Early Ceramic period. Because of the overall fewer number of Middle Ceramic components, and the difficulty of separating Early and Middle Ceramic cultural materials at multicomponent sites, the following information is derived from sites with relatively large Middle Ceramic components on the plains. As in the previous period, bison was the most common species, recognized in eight components.

Preservation of faunal remains in sites in the mountains is usually poor; long exposure on the surface, shallow burial, acidic soils, greater moisture, and longer and more extreme freeze/thaw cycles all promote relatively rapid deterioration of bone. These factors, coupled with the relatively few excavated sites in the mountains, mean that little direct evidence is available of the animals utilized as food. Bighorn bone was recovered from the Early Ceramic stratum at 5CC389 (Hand and Pearce 1990). Bone from an unidentified artiodactyl was found at Bode's Draw, 5LR1370 (Benedict 1993), and bone tools manufactured from deer and bison bone were also recovered, although these tools could have been manufactured elsewhere and brought to the site.

Remains of plants used for food are varied in Early Ceramic sites, although as discussed above, fewer sites are known where floral remains were recovered. Burned seeds and other plant parts are usually taken as indications of utilization by prehistoric people, as charring is thought to be indicative of processing, and uncharred seeds in open sites under most circumstances decompose long before they could be recovered by archaeologists. Remains of corn are discussed in the Research Questions below.

On the plains, goosefoot seeds are the most common macrobotanical remains in Early Ceramic components. These are followed by sunflower, grasses, purslane, wax currant, wild grape, yucca seeds, milkvetch, prickly pear cactus, bulrush, dropseed, cocklebur, amaranth, saltbush, ricegrass, evening primrose, smartweed, and ponderosa pine seeds.

Early Ceramic sites in the hogbacks/foothills are dominated by chokecherry, acorns, and wild plum, which have variously been accepted as representing utilization or rejected as intrusive. Other macrobotanicals remains include currant, netleaf hackberry, sunflower, juniper berries, dropseed, bedstraw, lambs quarter, pinyon pine, tansy mustard, fungus fruiting body, and fruity processed edible tissue (PET).

Macrobotanical remains from Middle Ceramic components derive mainly from sites on the plains, with a Middle Ceramic hearth from Dancing Pants Rockshelter representing the only component from the hogbacks/foothills. Macrobotanical remains have not yet been recovered from Middle Ceramic sites in the mountains As with Early Ceramic sites, *Chenopodium* and Cheno-Am were the most frequently reported seeds, with grass, saltbush, wild rose, flat sedge, nut

grass, prickly pear, purslane, ball cactus, raspberry, dock, buffaloberry, spiderwort, and edible starch also reported.

As Gleichman et al. (1995) point out, human utilization of plant resources is a continuum of various levels of plant-human interaction. On one end of the continuum are wild plants, with no human intervention in the growth cycle of the plants or modification of the plants' environments. At the other end of the continuum are cultivated domesticated plants. Cultivation can involve a wide range of activities, from the encouragement of certain plants through selective weeding, watering, or transplanting, to agriculture, which involves the planting and caring for domesticated crops in prepared fields (Gleichman et al. 1995:117-118). On the continuum between wild and domesticated plants are anthropogenic plant communities, which are those that are initiated and maintained unconsciously by human activities. Plants in these communities are adapted to disturbed habitats, including those disturbed by human activities, and are often weedy annuals. From prehistoric contexts where macrofloral remains have been recovered by flotation, the almost universal presence of burned *Chenopodium* seeds, in many cases to the exclusion of other floral remains, indicates the importance of this resource. The seeds of various grasses (Gramineae family) were also an important resource. Because *Chenopodium* sp. (goosefoot, lambs quarter) and *Amaranthus* sp. (pigweed) are weedy annuals, favoring disturbed areas such as long-term campsites, their wide-spread presence in Early Ceramic site contexts suggests that site locations were probably reused in part to take advantage of the concentration of this resource, and that the growth of these plants was either unconsciously encouraged by site inhabitants (Gleichman et al. 1995:117), or possibly consciously encouraged. Ethnographic and ethnohistoric examples of Native Americans burning large areas for a variety of beneficial environmental modifications, including creating an environment selection for food plants that are primary successors in areas that have been burned, are available if not well known (Stewart 1953, 1955a, 1955b). Purposeful burning of plant cover on a campsite at the end of a seasonal occupation could have improved the environment for economic grasses and weedy pioneers that would be available for collection when the group returned to the site. This periodic (or annual) burning may have contributed to the formation of the dark charcoal and ash stains that often accompany occupational debris in cultural strata at prehistoric campsites.

Evidence of horticulture in the Early Ceramic period is limited to the presence of *Zea mays* macrobotanical remains and pollen from a few sites in the Colorado Piedmont and hogbacks/foothills south of Denver, and two kernels of corn from Three O'Clock Shelter in the Pawnee National Grassland. Evidence of corn from the Middle Ceramic period is limited to one kernel of Dent corn from Agate Bluff I in Weld County, although there is reason to question the association of this corn with the Upper Republican component. Horticulture is discussed in greater detail below in Research Questions.

Technology

The discussion of the technological aspects of any particular period of time or individual site has been based for the most part on the examination of lithic artifacts, both chipped stone and ground stone, simply because this material constitutes the majority of all artifact assemblages in prehistoric sites in the Platte River Basin. The technology of Early and Middle Ceramic people in the Platte River Basin has not been discussed at length within the context of comparative studies of artifact techno-complexes associated with certain styles of diagnostic projectile points, the way Paleoindian and Archaic artifact assemblages have. Examination of technology within the Early

and Middle Ceramic artifact assemblages from the sites described above has focused on the procurement of raw materials from lithic sources and the subsequent uses of these materials within the manufacturing continuum between informal flake tools on one end and formal tools on the other, and the use of prepared cores to produce more standardized flakes versus less intensive, random core technology. These topics relate to questions regarding settlement and subsistence strategies, and obviously examination of projectile point styles is important to questions of cultural relationships. Other aspects of technology important to the interpretation of prehistoric behavior are ceramics (which is examined below in Research Questions), ground stone tools, bone tools, hearths and other features used to process food resources or other materials, habitation structures (also addressed in Research Questions) and the production of decorative items, many of which have been recovered from human burials.

One of the more interesting questions that has been at least partially addressed through in-depth examination of large, chipped stone assemblages is site function within the framework of the collector/forager continuum outlined by Binford (1980). Researchers from Centennial Archaeology, Inc. have recently addressed this question at several Early Ceramic sites within the Platte River Basin (Kalasz and Shields 1997; Kalasz et al. 1996, 1992). They found that technologies at the Magic Mountain site were representative of a residential base within a forager or collector subsistence-settlement system (Kalasz and Shields 1997), and assemblages from the Cass site and 5AH416 represented more limited-activity, task-specific field camps or locations primarily relating to midstage reduction of locally available lithic materials (Kalasz et al. 1993, 1996). At the Magic Mountain site and 5AH416, both biface and flake tool technologies are in evidence, with late-stage formal tool production also represented at Magic Mountain. Brunswig (1996) has also used lithic assemblages in conjunction with other aspects of archaeological components such as feature complexity and presence/absence of architecture and structure types to reconstruct collector/forager subsistence patterns, and believes that this approach shows promise as a technique for deriving meaningful information regarding cultural-environmental interactions.

Parry and Kelly (1987) discuss the correlation between increased sedentism and a shift from production of and primary reliance on formal tools to an expedient core, flake tool technology. Parry and Kelly (1987:303) qualify this statement by saying that mobile populations may also utilize an expedient core technology if lithic raw material is ubiquitous and abundant. Kalasz and Shields (1997) point out that even though the Early Ceramic components in eastern Colorado do not represent sedentary horticulturalists, these populations did rely heavily on an expedient flake tool technology, although not to the exclusion of biface manufacture. Kalasz and Shields (1997:327) also note that chipped stone assemblages from some Archaic sites also were dominated by flake tool technologies. This pattern was also observed at the Bayou Gulch site, where the Archaic strata were characterized by a statistically significant higher relative frequency of flake tools and lower relative frequency of formal tools compared to the Early Ceramic stratum (Gilmore 1991b).

Over the course of time, investigators have used various methods in the examination of chipped stone assemblages, and these have run the gamut between the subjective and descriptive to the ostensibly objective and quantitative in the search for insight into prehistoric behavior. Although far from standardized, the approach toward the description of different chipped stone tool categories has become somewhat more uniform over time, with relatively subjective functional/morphological categories giving way to more objective morphological/technological descriptions augmented by metric data. This shift has allowed for much greater comparability

between the tool assemblages from different sites investigated by different people. However, this is not the case when it comes to the many variations on the theme of debitage analysis. Many early reports present a simple count of the unmodified flakes without further subdivision or examination of reduction behaviors; later site reports use the familiar lithic trinity of primary, secondary, and tertiary flakes, often without stating the criteria used to define any of the categories. Even later investigators apply variations of Sullivan and Rozen's (1985) ostensibly objective and reproducible method, yet other analyses are performed using size grades of flakes (which are sometimes determined by which size screens were available at the time) coupled with a presence/absence classification of cortex. Although this listing of the various methods suggests an evolutionary trend, all of these methods are still in use at present, and any one of these methods could be found in use now on a survey, testing, or data recovery project somewhere in the state. Understanding the questions asked of the data, and the methods offering the best choice for recovering this information, coupled with the unavoidable need to derive the most amount of information possible for the least amount of time and money expended, are the conflicting goals of debitage analysis. Perhaps an overview of current analytical methods and their relative strengths, weaknesses, and theoretical basis with an eye toward the efficient and meaningful analysis of debitage should be researched and made available to investigators through the Office of Archaeology and Historical Preservation. It may be impossible to reach a consensus on this topic within the archaeological community, but greater uniformity of methods would allow for greater comparability of results between sites.

Variation within the small, corner-notched projectile point styles dating to the Early Ceramic period has been noted by investigators for over 40 years. However, the cultural relevance of this variation has yet to be proven unequivocally. The primary debate concerning technological/stylistic differences within small, corner-notched projectile points concerns the place of serration of point blade edges as a defining trait of the Hogback phase (Nelson 1971; Benedict 1975b, 1975c). The problem is found in trying to define the importance of this trait on the basis not of presence/absence in collections, but of its relative frequency of occurrence in projectile point assemblages in the hogbacks/foothills or mountains versus the plains. Eighmy (1994:229) states that 20 to 25 percent of projectile points from sites on the Colorado Piedmont have serrated blade edges, and this percentage rises to 40 to 50 percent in the hogbacks/foothills subarea. This pattern probably does reflect actual differences in prehistoric cultural behavior, but it is difficult to ascertain exactly what it does represent and how meaningful it is in isolation from other aspects of the culture. Defining a cultural entity based on an arbitrary break point in the frequency of projectile point blade serration lacks substance and meaning. Serration on the blade edges of projectile points is not temporally limited to the Early Ceramic period and is not limited to the hogbacks/foothills and mountains. Serration never does completely disappear from point assemblages the farther one travels east from the mountains, and in fact serration of projectile point blade edges is given as a trait that is diagnostic of the Plains Woodland Keith focus in Kansas and Nebraska (Wedel and Kivett 1956). The trait of serration on projectile points is perhaps more meaningful when considered within particular contexts, and as a single aspect of a cultural manifestation and not as a culturally diagnostic trait in and of itself.

Some investigators have distinguished separate types of small, corner-notched Early Ceramic period points based on criteria other than serration. Both Butler (1986) and Gilmore (1991b) distinguish two types or subtypes of small, corner-notched points at the Bayou Gulch site, and there seems to be concurrence between the two studies. Butler's Type 2, Magic Mountain Corner-notched and Gilmore's Type 8a points are described as small to medium points, often

serrated, with deep corner notches and narrow hafting widths. Butler's Type 1, Bayou Gulch Corner-notched and Gilmore's Type 8b points are described as small, thin points with shallow corner notches resulting in a wider haft width. Hogback Corner-notched points are similar if not identical to Butler's (1986) Type 2, Magic Mountain Corner-notched (Gilmore's 8a). There is a great deal of temporal and spatial overlap between these two point types, even occurring in the same components, which brings into question the cultural- historical validity of these types. To determine if Bayou Gulch and Magic Mountain Corner-notched points are different types, tests to determine the significance of the difference in haft width and thickness were performed using Students *t* test (Siegel 1956), with the point assemblage from the Bayou Gulch site providing the samples of Bayou Gulch Corner-notched (n=31) and Magic Mountain Corner-notched (n=25) points. The differences between the sample means of these two measurements were highly significant, with the associated probability of less than .001 in a one tailed test that these samples were from the same population. What cultural significance, if any, these tests indicate is unknown, but the difference in haft width and thickness between these two point types indicates a difference in technology that may have some cultural significance.

According to Butler (1986), the range of accepted ages associated with components in which Magic Mountain Corner-notched points were found is between 2170 and 545 B.P., which limits the usefulness of this point type as a temporal marker of the Early Ceramic period if these associations are correct and the contexts are undisturbed. Bayou Gulch Corner-notched points were found in components dated between 1500 B.P. and 510 B.P., which makes this type only slightly more useful as a temporal indicator. Butler presents the information as given by the original investigators.

As discussed in Settlement, above, several types of small, side-notched and unnotched points are associated with Middle Ceramic components in all three of the subareas. The amount of morphological variation within the class of side-notched points, including the amount of variation often observed within the same component, suggests that the people manufacturing these points did not strive for the same uniformity of style and standardization as Early Ceramic people apparently did. Perhaps this perceived increase in variation or number of point styles is related to a greater diversity of ethnic groups in the region manufacturing their own variation of projectile point. Whatever the source of this variation is, the understanding of it is insufficient at this point for these artifacts to have more than a general utility as temporally or culturally diagnostic artifacts.

The presence of what appear to be Avonlea projectile points at Early and/or Middle Ceramic sites (Bayou Gulch Type 9, Three O'Clock Shelter, Willowbrook Type IIIA) should be investigated further to determine if these points represent the actual presence of people from the Northern Plains in Colorado, or simply represent the range of variation in corner- and side-notched points manufactured by the indigenous prehistoric inhabitants of Colorado. Several points classified as Avonlea (Type 9, and perhaps some Type 10 points) at Bayou Gulch (Gilmore 1991b) were manufactured from local materials, which would eliminate trade as a source of these artifacts. Some investigators have hypothesized that the Avonlea culture of the Northern Plains and prairies may possibly represent ancestral Athapaskans (Wilcox 1988), and determining the cultural-historical validity of Avonlea points in eastern Colorado could provide information pertaining to the timing and route of Athapaskan migrations into the Southwest or onto the plains.

Ceramic technology is addressed in greater detail below in Research Questions. Ceramic technology during the Early Ceramic period does seem to be remarkably stable; at the Senac site, sherds from components dating between 1620 B.P. and 1070 B.P. exhibited nearly identical technology (O'Neil et al. 1988). At the Rock Creek site, the manufacturing technology and the use of Front Range sources of micaceous clay and tempering materials were similar between ceramics of the Early and Middle Ceramic periods at the site, and were also similar to ceramics of the Early and Middle Ceramic periods from other sites in the Colorado Piedmont (Ellwood and Parker 1995). The ceramics at Rock Creek were thought to "fit clearly into a ceramic tradition that is indigenous to the region" (Gleichman et al. 1995:12). Forty percent of the ceramic samples from Smiley Shelter contained Front Range tempering materials (Pikes Peak granite and Boulder granodiorite); the remaining samples contained quartz and quartzite alluvial sand tempering materials, which are available on the plains.

Because of the functional nature of ground stone, it has been assumed that ground stone has limited use as a temporally diagnostic artifact class. However, in their analysis of ground stone from the Magic Mountain site, Irwin-Williams and Irwin (1966) observed morphological change in manos through time. Ground stone from Magic Mountain was classified based on somewhat subjective morphological criteria (e.g., shape and characteristics of grinding surface, purposeful shaping of the artifact). The stratigraphic distributions of the resulting types suggested that manos were temporally diagnostic and could be used to differentiate between Archaic and Late Prehistoric occupations. This pattern has been tested at other sites, with mixed results. At the Bayou Gulch site, based on the Magic Mountain classificatory system, there was a statistically significant difference in the occurrence of Magic Mountain Type 2 manos (Magic Mountain Type II) between the Archaic strata and the Late Prehistoric strata, with the majority of Type 2 manos (the most common type at the site) occurring in the post-Archaic strata (Gilmore 1991b). Although the collection of manos from the Archaic strata was also dominated by Type 2 manos, overall there was a much greater diversity of mano types associated with the Archaic strata. The Magic Mountain typology was also applied to the collections of manos from Bradford House II and Bradford House III, with mixed results. Although the frequency of occurrence of some mano types did differ between the Woodland and Archaic components at these sites, the distribution of some types was contrary to the patterns observed at Magic Mountain. The results of this analysis were inconclusive, because although some types did occur in greater frequency in one context or the other, these temporal associations were thought less than useful at providing temporally diagnostic artifacts unless the temporally sensitive types were exclusively associated with either Archaic or Woodland components, and this was not the result (Johnson et al. 1997:149-151). However, even if they are not useful in providing temporal indicators, these differences between Early Ceramic and Archaic components may reflect technological differences in the processing of materials through time. At Bayou Gulch, the greater diversity in mano types was interpreted as possibly representing a greater number of activities or materials processed during the Archaic versus the Late Prehistoric, or more specialized processing (Gilmore 1991b:159). Conversely, the less diverse collection of manos within the Late Prehistoric strata may also indicate more generalized processing techniques or greater amounts of fewer types of materials processed. One interpretation of this pattern is that it could represent a greater reliance on the products of horticulture. These conclusions are preliminary and need independent confirmation; they may simply reflect error in applying a subjective classificatory scheme. Both analyses suggest that ground stone assemblages may contain more information than has been investigated previously.

Paleoenvironment

Paleoenvironment for the Late Prehistoric stage is expounded in Chapter 2. The following is meant to explore how paleoenvironments would have influenced cultural processes during this period.

The initial portion of the Early Ceramic period corresponds to the latter part of the Sub-Atlantic episode, evidenced by eolian activity that continued until ca. 1600-1500 B.P. Late Archaic/Early Ceramic populations were expanding at this time, possibly in response to the amelioration of climate.

The Scandic climatic episode, dated 1680-1280 B.P. (Bryson and Wendland 1974; Wendland 1978) and 1500-1200 B.P. (Wendland 1995) is characterized by a warming trend that culminates in the subsequent Neo-Atlantic episode (Wendland 1978:281). According to Brunswig (1996) and Wedel (1986), the Scandic is warmer and probably slightly drier than conditions during the late Sub-Atlantic, but still cooler and moister than present. Greater plant and animal resource density would allow for the utilization of a subsistence and settlement system closer to the collector end of the forager-collector end of the continuum, leading to greater residential stability (Brunswig 1996).

During the Neo-Atlantic climatic episode, dated 1260 B.P. - 850 B.P. (Bryson and Wendland 1974; Wendland 1978), the plains were characterized as somewhat more moist than later in time (Wendland 1978). Brunswig (1996) and Wedel (1986) characterize this episode as continued warmth, with increased moisture, resulting in increased summer precipitation. This warming and increased summer precipitation may have resulted in environments in the hogbacks southwest of Denver and the northern Palmer Divide crossing the critical threshold of summer precipitation that allowed for more reliable corn horticulture in the area, which could explain the cluster of sites in this area with evidence of corn. Most of the components that contain corn are undated, or in the case of the LoDaisKa site, are associated with bracket ages that encompass almost all of the Early Ceramic period. However, evidence of corn from Franktown Cave and Bayou Gulch is dated between 1000 and 840 B.P. (cal A.D. 1020 and 1280).

The beginning of the Pacific climatic episode, dated 850-400 B.P. (Bryson and Wendland 1974; Wendland 1978) correlates well with the beginning of the Middle Ceramic period, ca. 800 B.P. The Pacific episode is characterized by increased westerly, or Pacific, air flow, resulting in increasing desiccation east of the Rocky Mountains (Wendland 1978). In the Platte River Basin multiple lines of information indicate xeric conditions during this period. This decrease in effective moisture on the plains would have resulted in decreased density of plant and animal resources, which could have influenced economic strategies on the plains and Colorado Piedmont. Middle Ceramic components in the Colorado Piedmont are more ephemeral and less complex than Early Ceramic components, suggesting greater residential mobility and an economic system closer to the forager end of the forager-collector continuum (see Brunswig 1996). The deterioration of environment that characterized the Pacific episode in eastern Colorado and points east may have adversely affected horticultural production in the Upper Republican core area, necessitating a return to a greater reliance on gathered resources. The reduced carrying capacity due to lower resource density may have made dispersal of formerly clustered populations necessary to survival, and this dispersal may partly explain the appearance of typically Upper Republican components on the High Plains of Colorado during this time.

Paleodemography

It is impossible to determine the actual size of prehistoric populations, especially when the populations are transhumant hunter-gatherers. However, it is reasonable to assume that relative population trends are reflected in the overall number of sites that can be assigned to certain time periods on the basis of temporally diagnostic artifacts, and especially if those sites can be dated using absolute dates. Figure 1-2 shows the uncalibrated radiocarbon ages in the Platte River Basin, both as frequency per century and as a 300-year running average. According to the latter, the number of dated occupations begins to increase just after 4000 B.P., and reaches a stable level that maintains until just after 2200 B.P., near the end of the Late Archaic period. At this point, radiocarbon ages increase at an almost exponential rate, compared to the slope of the curve for the previous 7,000 years. The number of radiocarbon ages steadily increases for the next 800 years, and reaches a plateau that lasts for perhaps two hundred years, between 1400 B.P. and 1200 B.P. The number then begins to decrease at a rate that is approximately the same as the rate it increased, finally reaching the approximate pre-2200 B.P. level between 500 and 400 B.P., at the end of the Middle Ceramic period. Although this method cannot be considered exact in showing population trends (it does not take into account multiple ages from the same component at some sites, for example), it should reflect the gross trends in population. The trends described above are likely to confirm what most investigators in the area have thought for years, that the increase in Early Ceramic sites compared to the Late Archaic period probably reflects an actual increase in population. Answering the question of why this occurred is another much more complicated matter.

The hypothesized population trends observed in the radiocarbon age frequency curve are reflected in the number of human burials assigned to the Early and Middle Ceramic periods in the Platte River Basin, as compared to the previous Archaic stage and subsequent Protohistoric period. The vast majority of well-documented burials in the northeast part of the state are assigned to the Early Ceramic period (n=50), and more than 60 other burials that are not as well documented possibly date to the Early Ceramic or the Middle Ceramic period. Only three relatively well documented burials discussed above are attributed to the Middle Ceramic, and one of these (Chubbock-Oman) is actually located in the Arkansas River Basin.

Burials

Early Ceramic Burials. In the 15 years since the last prehistoric contexts were written (Eighmy 1984; Guthrie et al. 1984), only nine additional burials dating to the Early Ceramic period have been reported in the Platte River Basin, and two of these are represented by a single mandible from the Baumgardner site and the two teeth that represent Individual 2 from the most recent excavations at Magic Mountain (Kalasz and Shields 1997). However, inclusion of new information from these sites in addition to the descriptions of several sites that have not been previously described in the literature, adds significantly to the database. Although the information for some of the sites described previously is minimal, and some of this information comes secondhand from nonarchaeologists, examining the group as a whole reinforces the patterns that have been noted in previous overviews (Breternitz and Wood 1965; Scott and Birkedal 1972; Butler et al. 1986).

Although not stated directly, the most obvious general characteristic of Early Ceramic burials is the increase in elaboration when compared with Archaic burials. However, there is as

much variation between the most elaborate and the least elaborate of the Early Ceramic burials, and this range can include burials within the same site (e.g., Hazeltine Heights). One obvious factor to consider is the difference in sample size between the Archaic and Early Ceramic (see Chapter 5).

Notable similarities are apparent between some of the burials attributed to the Early Ceramic period excavated in northeastern Colorado and those of Plains Woodland sites to the north and east, and the similarities are meaningful. The primary similarity is the inclusion of shell ornaments manufactured from both freshwater and marine species, specifically shell disk beads and clamshell pendants, some drilled with two suspension holes similar to a gorget. Accompaniments from the Gahagan-Lipe site include a triangular *Unio* (cf.. *Lampsilis*) pendant similar to triangular shell pendants at Plains Woodland burial sites such as Woodruff ossuary (14PH4), Robb Ossuary (25WT4), and Guide Rock Ossuary (25WT4) (Kivett 1953:Plates 25 and 26).

Based on collections from several ossuary sites in the Republican River valley, Kivett (1953:135) considered material culture traits that are diagnostic of the Keith focus (among other artifact types) to be abundant use of freshwater and marine shell ornaments as burial accompaniments, including shell disk bead blanks and unfinished beads; triangular shell pendants; crescent shell pendants; incised tubular bone beads, small to large, stemmed and barbed projectile points; perforated canine teeth; unperforated rodent teeth; and Harlan Cord-roughened pottery (Kivett 1953:135). Both Kivett (1953:118) and Butler et al. (1986:23) observed that ornaments, including shell beads, bone beads, and shell pendants, are found more frequently with subadults than with adults. A second less pronounced but recognizable trend was for more female burials to contained shell accompaniments than the burials of males. Chipped stone tools, atlatl weights, and unmodified flakes were the burial accompaniments usually associated with males, and ground stone and decorations were associated with females (Butler et al. 1986:Table 6). There are exceptions to every rule, and some recent discoveries run counter to this pattern. A male buried with both shell disk beads and *Olivella* beads was found at the Beacon Hill site north of Pueblo (Black et al. 1991) and the above described Lena Gulch and Lightning Hill burials are both adult males buried with decorative shell ornaments and beads. The male burial at Lena Gulch also contained a bifacial mano.

Butler et al. (1986) consider the accompaniments and their association with females at the Young site to be different enough from the patterns observed in burials in Colorado to hypothesize that they may represent a different Early Ceramic group of people than those found in northeastern Colorado. The turtle shells, unmodified mussel shells and tubular bone beads, and apparent absence of shell disk beads in all of the 16 or more burials reported from 5MR3 is similar to the pattern observed at the Young site, and gives added support for the association of these sites with a different cultural group. However, neither the Young site nor 5MR3 has associated absolute ages or temporally diagnostic artifacts that could be cross-dated, so the apparent cultural difference in burial accompaniments and, by inference, burial ritual between these sites and Plains Woodland burials in the Central Plains may be due to a temporal difference in addition to the apparent cultural differences.

Several other burials described above for Colorado and surrounding states may also be a part of this pattern. The Hutcheson, Bisterfeldt, and possibly the poorly documented Howard Rollin site are all sites with burials that contain relatively large numbers of tubular bone beads, may or may not contain locally available freshwater clam shell ornaments, lack exotic shell disk

beads, and contain very few or no *Olivella* shell beads. The Beacon Hill burial is believed to be the only burial in eastern Colorado that contained shell disk beads without any tubular bone beads. Of the sites that contain bone beads but few or no shell beads, two have at least a tentative date associated with them: 1805 B.P., 2-sigma cal range A.D. 1-443 for Hutcheson, and an estimated age of pre-A.D. 500 for Bisterfeldt. Whether this pattern is significant remains to be seen. It could represent a cultural difference as suggested by Butler et al. (1986), or it could represent a temporal difference, with shell disk beads entering burial contexts at a later time (e.g., Roberts Ranch, with an associated age of 1520 B.P., 2-sigma cal range A.D. 260-690), or it could represent a simple lack of availability of an exotic material at the time of interment. The shell disk beads recovered from the Woodruff Ossuary and other ossuary sites of the Keith phase are thought to be manufactured from fresh water species (Kivett 1953:112; Wedel 1986:89). If true, the exclusion of shell disk beads in favor of tubular bone beads may in fact reflect a culturally defined preference and not just lack of availability, as freshwater shellfish are much more readily available than marine genera such as *Olivella*. Of course, the observed pattern could simply be the result of small sample size and have no cultural or temporal meaning at all. The excavation of additional, well-dated burials is necessary to answer this question. Shell of any sort is rare in Early Ceramic habitation site contexts, and complete shell beads or evidence of manufacture represented by bead blanks are unknown outside burial contexts in Colorado. This absence suggests that this artifact class may have been manufactured specifically for use as burial accompaniments as they were needed, or perhaps were obtained through trade from farther east. Freshwater shellfish are available in eastern Colorado (Wu 1989), although it is unknown whether these species produce shells thick enough for the manufacture of disk beads, as do species to the east in Kansas and Nebraska. At present, there is no evidence of stockpiling of either raw materials for future manufacturing needs or finished product. This suggests a very specific context in which shell was utilized within Early Ceramic society.

Previous overviews of Plains Woodland burial practices have observed that ceramics are notably absent from Early Ceramic/Plains Woodland burials in Colorado (Butler et al. 1986:23). Two sites provide exceptions to this observation. At the Lena Gulch site, the upper individual, a male, was buried with a possibly complete conoidal, cord-marked vessel (Dan Jepson, personal communication 1999). The poorly reported burial excavated from 5EL66 contained a fragmentary, cord-marked vessel. From outside Colorado, the primary extended burial of an adult male in Sioux County, northwest Nebraska, contained a large, complete cord-marked conoidal Woodland ceramic vessel, as well as a mano (Gill and Lewis 1977). Cord-marked sherds were present in the general pit fill at Woodruff Ossuary, but in low frequencies that suggest that their inclusion in the fill of burials was an inadvertent consequence of the burial process and not as accompaniments (Kivett 1953).

Although often cited in overviews of Early Ceramic period/Colorado Woodland burial practices as examples of secondary bundle burials, the authors of both the Bisterfeldt site and Woodruff Ossuary make the observation that the secondary remains are scattered and do not seem to represent bundle burials (Mattes 1965; Breternitz and Wood 1965; Kivett 1953). According to Breternitz and Wood (1965), secondary burials may represent a later burial pattern than primary interment. They interpreted that at the Bisterfeldt site the flesh burials in pits were disturbed by excavation of the ossuary pits, although one of the primary burial pits appears to have been excavated into the fill of one of the ossuary pits, and the pit of the other flexed primary burial appears to have been excavated overlapping the edge of another ossuary pit, and not intruded on by the excavation of the larger pit. The pattern of secondary burial superseding primary burial is not

supported by the available absolute dates associated with secondary burials in Colorado. Secondary burials in Colorado and the western Central Plains generally have early associated ages, such as Ehrlich at 2095 B.P., and 1740 B.P. (Brunswig and Wanner 1993); Kerbs-Klein at 1780 B.P. (Scott 1979); the age associated with the possible secondary burial at Aurora, 1570 B.P. (Guthrie 1982); and the cross date of pre-A.D. 500 for the Bisterfeldt site, based on the presence of atlatl weights and dart points and absence of arrow points. The single exception to this rule may be the Ancell burial from northwest of Rocky Ford in the Arkansas River valley (Black et al. 1991), which has a radiocarbon age of 1000 ± 70 B.P. Ancell may represent another example of secondary articulated burials similar to those described at the Ehrlich site (Kevin Black, personal communication 1999). The Ancell burial was described as a primary flexed burial; however, the right scapula and right side of the ribcage are missing, and no disturbance of the adjoining elements is evident, suggesting that those elements were removed before burial or shortly after burial when the soft tissues had partly decayed. The Beacon Hill burial (found north of Pueblo) is also a secondary burial (Black et al. 1991), in that the head was apparently removed and buried in a pit adjacent to the pit containing the post cranial skeleton. The postcranial skeleton was in a very tightly flexed anatomical position, suggesting primary burial, or possibly a secondary articulated burial. Secondary articulated burials may represent an extended burial ritual involving one or more reopenings of graves for rites involving body manipulation (Kevin Black, personal communication 1999). Secondary burials may be earlier, and primary burials may be a phenomenon of the Late Woodland/Plains Woodland period (A.D. 500-1150), or may represent a increasingly tenuous connection with the east and a reversion to an older pattern. Absolute ages associated with primary burials overlap with those associated with secondary burials, but the ages of primary burials with Plains Woodland associations extend later into the Early Ceramic period, and possibly into the Middle Ceramic period (see Chubbuck-Oman burial below).

The lack of well-documented large ossuaries in the Platte River Basin is possibly due in part to differences in social structure and settlement pattern between Early Ceramic groups in eastern Colorado and contemporaneous groups farther east. These differences in social structure and settlement pattern could be linked to the different adaptations imposed by environmental differences between the two areas. In the dry, horticulturally marginal plains of Colorado, there was a lower population density and no clustering of population based on the generally higher density of economic resources and possibly marginal horticulture enjoyed by the inhabitants of small villages farther east (Breternitz and Scott 1965). People who lived on the western periphery of the Plains Woodland culture did not live in groups large enough to produce large ossuaries such as seen to the east, but the cultural identification with Plains Woodland peoples is indicated in the burial patterns and the rituals inferred from these burial patterns. These cultural connections and a sense of cultural identity are better reflected in evidence of shared rituals than can be inferred by any similarities in more purely technologically and economically related aspects of material culture, such as projectile point types and ceramics.

Unfortunately, some of the sites that may have provided the best evidence of a cultural relationship between people of the Plains Woodland Culture and the Early Ceramic on the western fringe of the Central Plains are the most poorly documented. Based on the minimal information on the cultural material associated with the remains of at least 27 people, the Garcia site was probably an ossuary with a Plains Woodland association. Descriptions of the possible burial mounds at the Sadar site and the Paul Whitman Ranch are ambiguous, but the concept is intriguing. If the mound at the Sadar site was a prehistoric cultural feature as is implied on the site form, it may be unique within this region and would be the first Woodland burial mound reported in Colorado. The size

of the linear ridge that was thought to be a possible burial mound described for the Paul Whitman Ranch (5.5 x 183 m [18 x 600 ft], no height given) may preclude any realistic possibility that it was a prehistorically constructed feature. Even assuming a modest 36 cm in height, this mound would contain a greater volume of earth than any other Woodland burial mound on the Great Plains (Krause 1995). The nearest examples of Woodland burial mounds are found in the Republican River valley south of the Nebraska-Kansas state line, which Wedel (1986:81) states "are at or very near the westernmost limits of the aboriginal burial mounds in the central plains." The Republican River mounds ranged between just under 3 m^3 and 334 m^3 in volume, and contained both extended and flexed primary burials as well as secondary bundle burials. Some mounds contained pockets and clusters of burned and broken bones, and others contained bones grouped by skeletal element (Krause 1995:132). Common accompaniments included shell disk beads, and tubular beads of bird or small mammal bone that were often incised in spiral or annular patterns (Wedel 1986:82). Material recovered from these mounds related to a western Hopewellian tradition centered in the Kansas City area between the first and sixth centuries A.D. (Wedel 1986:81).

The Lena Gulch burials are interesting for several reasons. The form of the stone beads associated with the burials and the materials from which they were manufactured are unique for the Colorado Front Range and Eastern Plains in an Early Ceramic context. Given the unique nature of these artifacts and their association with both burials, it seems reasonable to suggest a familial relationship between these two people in addition to the obvious cultural and temporal relationship already postulated. The presence of an unusual and specific wear pattern on the first mandibular molars of both individuals suggests a shared learned behavior, which supports this hypothesized relationship. Barring DNA testing of human bone, the Lena Gulch burials may provide the best evidence presented to date in Colorado for a familial relationship between two individuals in prehistory. The occurrence as burial accompaniments of those items traditionally identified as tools and decorations most often associated with females (ground stone, ceramics, and ornaments) with an individual identified as a male, and a flintknapping kit with an individual identified as female, is counter to what has been perceived as the prevailing pattern of mutually exclusive grave accompaniments by sex (e.g., Butler et al. 1986; Butler 1994). Although the determination of the sex of the two individuals is considered equivocal, alternative explanations that challenge the normative constructs of gender with regard to the archaeological record that are still prevalent in the field today are necessary in order to explain unexpected associations such as those in the Lena Gulch burials and the above described Sioux County, Nebraska burial (e.g., Gero 1991; Wright 1991).

The presence of what are possibly gilsonite beads with the Lena Gulch burials is also interesting. Artifacts manufactured of Kremmling chert were associated with the Lena Gulch burials, and so Middle Park was an important source of raw materials for these people, and a source for gilsonite in Middle Park could have provided the gilsonite used to manufacture the beads. The use of gilsonite for beads has not been previously documented in prehistoric contexts in eastern Colorado. Gilsonite beads, however, are known from Fremont sites in the Uinta Basin, an area that contains a major source of gilsonite. It would be ironic if after the 40 years since Irwin and Irwin (1959) became the first (and perhaps last) investigators to posit a Fremont occupation in the hogbacks/foothills, there was evidence to suggest a Fremont connection to eastern Colorado. Another piece of evidence that has been considered suggestive of a Fremont connection to the Front Range is a flicker feather headdress from Dinosaur National Monument in the northwestern corner of the state that may be of Uinta Fremont or possibly Ute origin. This

artifact was found in Mantle's Cave (5MF1) and was manufactured with feathers from a species whose range is currently restricted to the Colorado Front Range (Truesdale 1993). An average of the radiocarbon ages returned for samples of buckskin and ermine fur taken from the headdress is 949 ± 39 B.P., with a 2-sigma cal range of A.D. 996-1190, which spans the transition between the Early Ceramic and Middle Ceramic periods in eastern Colorado. The prehistoric range of this species of flicker is unknown, but a prehistoric range much larger than present could provide an alternative explanation to a cultural connection.

Although the majority of documented primary burials reported for the western margin of the Central Plains are flexed and placed on their sides, there are several examples of burials placed in sitting or kneeling positions. These include two of the three primary burials at the Bisterfeldt site, the Red Creek burial which is in the Arkansas River basin (Butler et al. 1986), 14TO301 in west-central Kansas (Finnegan and Witty 1977), two examples from Magic Mountain (Irwin-Williams and Irwin 1966; Kalasz and Shields 1997), and possibly the secondary articulated Burial 2 at the Ehrlich site (Brunswig and Wanner 1993).

Middle Ceramic Burials. The relative paucity of accompaniments with the burials from Peavy Shelter make any sort of cultural interpretation difficult. These burials do not differ significantly from the less elaborate burials dating to the Early Ceramic period, and perhaps this similarity could be used to support a continuity, even though tenuous, between Early and Middle Ceramic period burial ritual. However, a lack of difference does not necessarily equate similarity, and many of the similarities between burials, especially in the flexed position in which most individuals are buried, is probably as much a factor of economy of excavation of the burial pit as in culturally dictated standards.

Counter to the situation described above, the similarity between the Chubbuck-Oman burial and Plains Woodland burials from elsewhere in eastern Colorado, some with radiocarbon ages from the first few centuries of the Early Ceramic period, would seem to indicate a long period of cultural continuity in burial ritual that extends from ca. A.D. 500 into the Middle Ceramic period. The exotic and locally available shell accompaniments with this burial and their ritual placement within the oral cavity would seem to have more of a cultural relationship to the previous Early Ceramic period of Colorado than to the burial patterns of the Upper Republican or other cultures of the Central Plains tradition to the east, or the Apishapa to the south.

This consistency of burial pattern may indicate that the indigenous populations living on the western margin of the Central plains maintained a cultural identity more closely related to the peripheral Plains Woodland culture long after that cultural manifestation had evolved into the village cultures of the Central Plains tradition farther to the east. The persistence of the Early Ceramic cultural pattern into what was conventionally thought to be the Middle Ceramic period is supported by both Early Ceramic components with late dates such as Bayou Gulch, Senac, and Rock Creek in the South Platte portion of the Colorado Piedmont, and by the Sioux County, Nebraska burial, which contained a whole ceramic vessel that was assigned a Woodland affiliation (Gill and Lewis 1977). This burial had an associated radiocarbon age of 750 ± 90 B.P., 2-sigma cal range A.D. 1065-1407. Even taking into consideration of the above information, the recent age for the Chubbock-Oman burial suggests that caution should be used before accepting this information as representing cultural continuity over 1,000 years.

Research Problems

Early Ceramic Period

The following are Research Problems for the Early Ceramic period, as suggested by Colorado archaeologists in Eighmy (1984).

- Examination of taxa.

The taxonomic framework used for this document was not devised after thoughtful consideration of all of the competing systems that have been presented previously. By default, we have structured this document in a way that follows the taxonomic structure with some modification of the previous prehistoric context of Eighmy (1984), the post-Archaic structure of which was in turn based on the system of Wood (1967). The taxonomic framework of Guthrie et al. (1984) was not used because the place of horticulture in the subsistence of people during the time period was apparently quite small compared to hunting and gathering. In addition, the social structures and population aggregations considered part of the Formative stage as defined by Willey and Phillips (1958) do not really apply to the cultures of the plains and hogbacks/foothills of the Platte River Basin, let alone in the mountains, as Guthrie et al. (1984:38) point out.

In using this familiar if not completely satisfactory taxonomy already known to archaeologists working in this area, we an attempt is made here to avoid the pitfall of potentially adding to the confusion and becoming part of the problem. This sort of document, which by its nature is meant to be an objective presentation of a descriptive summary, may not be the proper venue to propose new taxonomy. This is especially true when larger and more theoretically oriented documents devoted completely or in large part to the topic of prehistoric taxonomy in eastern Colorado, have proposed taxonomies that have not been met with immediate and universal approval from the archaeological community (e.g., Butler 1986; Wood 1967). The following is an abbreviated review of taxonomies that have been applied to the Early Ceramic period in the Platte River Basin of eastern Colorado.

Gleichman et al. (1995:125) agree with the Gunnerson's (1987:44) assertion that calling sites on the Front Range "Woodland" is to "expand the taxon to an absurd limit." Butler (1988:452) points out that very little evidence supports a direct cultural relationship to cultures in the Woodlands in the eastern U.S., but the terminology is so entrenched in the literature of the region that to discard it would risk "being convicted of heresy." Even without considering the substantial inertia the term has in the archaeological literature at this point, it is difficult to deny the connections with the Plains Woodland cultures of western Kansas and Nebraska, even if the artifact assemblages associated with Plains Woodland components in Colorado seem much more abbreviated and generalized. This would seem to be especially true after examining the apparent similarities in burial ritual (see above), which is the single factor that best demonstrates a shared cultural identity more than any technological element. The Woodland pattern is a widespread cultural phenomenon, and Plains Woodland or "Woodland-like" components and phases reported from the western periphery of this pattern are found from the Northeastern Plains of the Dakotas, southeast through eastern Wyoming and Colorado, down through northeastern New Mexico and into the Texas and Oklahoma panhandles (see Schlesier 1994). Although a direct cultural connection between Early Ceramic groups in eastern Colorado cannot be confirmed by the presence of technological similarities with the Central Plains, these spatially widespread and

temporally persistent similarities in technology are unusual in the archaeological record after the Paleoindian stage, which could indicate a cultural phenomenon beyond a simple diffusion of useful technology. What this hypothetical cultural phenomenon may include is unclear.

The proliferation of cultural taxa within the Early Ceramic period in eastern Colorado and the validity of these units has been examined in detail by Butler (1986, 1988), who has proposed the South Platte phase and the Arkansas phase under the Colorado Plains Woodland Regional Variant. The difficulty of adopting a new taxonomy is manifested in the nature of taxonomy itself. In a detailed critique of the cultural taxonomies used in eastern Colorado (see also Eighmy 1984), Butler (1986, 1988) points out the shortcomings of the various mix-and-match taxonomies that have been applied to the prehistory of eastern Colorado in general, and to the Early Ceramic period/Woodland period in particular. He demonstrates the generality of the characteristics that have been used to define cultural taxa within the Early Ceramic period. The taxa that Butler considered are the Parker and Graneros foci of Withers (1954) and the Hogback phase of Nelson (1971). The criteria defined for these different taxa are for the most part based on subjective interpretations or the frequency of occurrence of certain subtle characteristics or traits within artifact assemblages that are difficult to quantify, and the actual meaning or cultural relevance of which are unknown. These lists of defining traits usually include at least one discriminating criterion applied to material culture that is difficult to quantify within a variable assemblage, such as incurving or straight rims on cord-marked conoidal ceramic vessels instead of straight to outcurving rims (Withers 1954), or "a high incidence of serration" on the blade edges of small, corner-notched projectile points (Nelson 1971). Other criteria may be more process oriented but just as difficult to pin down, such as recognizing the slight differences between the generalized artifact assemblages of groups that have mountain-oriented or mountain-based subsistence and settlement systems and the similar assemblages of plains-oriented groups during the same temporal period. Few of the generalized Early Ceramic/Woodland components in the Platte River Basin could be excluded from any one taxon based on material culture alone.

Butler's (1988) simplification of Early Ceramic taxonomy does have merit because of the paucity of information available at present. However, this is not to say that discarding of any of the proposed taxa out of hand is warranted. Several of the cultural taxa proposed in the past represent real cultural phenomena that have been recognized by many investigators, but archaeologists still lack the information necessary to adequately define them, at least in a way that is based primarily on objective criteria. To paraphrase Supreme Court Justice Potter Stewart's famous observation about pornography, I may not be able to define the Franktown focus, but I recognize it when I see it. It is because so many investigators have recognized these patterns that lends validity to the existence of distinct cultural units within what has been known by variations of the Plains Woodland or what has been called simply the "Woodland" tradition, pattern or culture in the Platte River Basin. No doubt many of these units will eventually be defined in a way that is both culturally and therefore taxonomically valid.

The cultural taxonomy defined for the post-Archaic occupations of the mountains uses a mixture of elements and concepts from various sources (Guthrie et al. 1984), which has resulted in problems of consistency in the application of these taxa. This is undoubtedly a result of the untenable situation created by the size of the original mountains study region and the resulting number of unrelated cultures included within this region on both sides of the Continental Divide. The Formative stage (A.D. 500-1300) designates the possible use of the mountains by horticultural people living at lower elevations on both sides of the mountains, including Woodland and Upper

Republican people of eastern Colorado. The following Protohistoric/Historic stage is subdivided into two periods, the Late Prehistoric period (A.D. 1300-1600) and the Ute/Shoshoni period (A.D. 1600-1800). Use of the concept of the Formative stage (Willey and Phillips 1958) as a cultural taxon in the mountains is unfounded in the upper Platte River Basin, because the criteria outlined in the definition of this taxon are not even met east of the mountains on the Colorado Piedmont and plains of northeastern Colorado, where there actually is some evidence of the basic hunting and gathering subsistence base being supplemented by limited horticulture. Significant use of the mountains by people whose subsistence mode could be classified as Formative stage was probably limited to the western slope Fremont in the upper Colorado River Basin and the Anasazi in the lower Colorado River Basin.

The use by Guthrie et al. (1984) of the taxon "Late Prehistoric period" (Frison 1978, 1991a) as a subdivision within the Protohistoric/Historic stage is also problematic. As originally defined, Frison's Late Prehistoric period was taken from Mulloy's (1958) cultural-historical outline for the Northwestern Plains, and covered the post-Archaic period between approximately A.D. 500 and 1800. The Late Prehistoric period incorporates the introduction of the new technologies of the bow and ceramics as defining characteristics. In light of this definition and temporal span, Guthrie et al.'s (1984) use of Late Prehistoric period as a taxon defining the period between A.D. 1300 and 1600 within the Protohistoric/Historic stage is inappropriate temporally, hierarchically, and taxonomically. It is inconsistent to define a cultural evolutionary stage designated as the Protohistoric/Historic as beginning at A.D. 1300 (Guthrie et al. 1984:46), long before the arrival of European influences in the area, and even more so to extend the beginning of this stage to A.D. 500 (Guthrie et al. 1984:7). The majority of investigators working in the mountains have used the concept of the Late Prehistoric period with a temporal range similar to that used by Frison to classify post-Archaic cultures (Benedict 1975b; 1975c; 1990; 1993; 1996; Lischka et al. 1983). Others have used the descriptive term "Post Archaic" to designate what is essentially the same temporal period (Windmiller and Eddy 1975) . This term also has limited utility in designating this period of time because of the persistence of essentially Archaic lifeways and economies into the Historic period in the mountains.

- Investigation of horticulture.

According to Adair (1988), cultigens derived from tropical plants known for the Central Plains east of the present study area include corn (*Zea mays*), squash (*Cucurbita pepo*), bottle gourd (*Lanenaria siceraria*), and beans (*Phaseolus vulgaris*). In addition, native plants such as marshelder (*Iva annua* var. *macrocarpa*) and sunflower (*Helianthus anuus* var. *macrocarpus*) also were cultivated. Although it cannot be demonstrated in archaeological contexts in the Central Plains, other native plants, including species of *Chenopodium,* have been recovered in archaeological contexts in the eastern woodlands suggesting these plants were not just collected, but cultivated (Adair 1988:47). The farther west one moves on the plains, the more meager the evidence for horticulture becomes. Most of the evidence of the above species is ambiguous or from poor contexts from the study area. Uncharred squash seeds were recovered from several levels at Bradford House III, and thought to be the result of recent rodent activity. Macrobotanical sunflower remains were recovered from the Cass site, recent excavations at Magic Mountain, Box Elder-Tate Hamlet, and Agate Bluff IV, although there is no evidence to suggest that these seeds represent a cultivated variety. This conclusion also applies (almost without saying) to the *Chenopodium* macrobotanical remains recovered from multiple components in the Platte River Basin. At present, there is no documented evidence of domesticated beans in archaeological

contexts in the Platte River Basin. One uncharred *Iva* sp. seed was recovered from recent excavations at Magic Mountain. This single seed is thought to represent the only documented occurrence of this species in an archaeological context in the Platte River Basin, and because it is uncharred, its relationship to the prehistoric occupation of the site is in question.

The only cultigen that has been recovered from apparently undisturbed archaeological contexts in the Platte River Basin is corn, and this evidence has resulted in various interpretations and has generated more questions than it has answered. In the 15 years since the previous prehistoric contexts were written, few additional data in support of horticulture have been recovered, and much of this additional information is as ambiguous as what was previously known. Most of the evidence of corn that has been recovered from Early Ceramic contexts is from the hogbacks/foothills and areas directly adjacent to the hogbacks/foothills in the area south and west of Denver. These sites are LoDaisKa, Willow Springs, and Big Morrison I, 5DA90 at Chatfield Reservoir, Franktown Cave, and Bayou Gulch. The association of the corn with the subsurface prehistoric component at site 5DA90 was apparently valid, although the lack of an absolute age and diagnostic artifacts from the subsurface component makes interpretation of this site problematic.

The unpublished excavations of two undated rockshelters referred to by Irwin-Williams and Irwin (1966) are an intriguing but cryptic addition to our knowledge of corn in Woodland contexts. A "preponderance" of small serrated points were found with Dent corn at Willow Springs, and "principally" unserrated points, coarse, deeply cord-marked pottery, and one kernel of Dent corn were recovered from Big Morrison I (Irwin and Irwin n.d., cited in Irwin-Williams and Irwin 1966:210). Some of this information does suggest that corn was grown in the Platte River Basin, and was not simply a trade item originating elsewhere. *Zea mays* pollen was found in soil samples and on ground stone artifacts from Stratum 2b at Bayou Gulch, with bracket dates of A.D. 1020-1220. Evidence indicative of local horticulture is a bison scapula with modifications and use wear suggestive of use as a hafted digging tool or hoe, found in Feature 19 at Bayou Gulch. Feature 19 has associated bracket dates of A.D. 1040-1220. Bison scapula hoes are often associated with Middle Ceramic Central Plains tradition sites where they are interpreted as horticultural tools. These tools are not limited to Middle Ceramic contexts, and a bison scapula digging tool was recovered from the Doyle site (25RW28), a Keith variant Plains Woodland site in southwestern Nebraska, with associated radiocarbon ages of 1370 B.P. and 1430 B.P. Although no evidence of cultigens was recovered from this site, this artifact indicates the importance of plants, and possibly cultivation, to western Plains populations (Grange 1980, cited in Adair 1988:34).

The presence of what passes for a huge quantity of corn in a prehistoric context in eastern Colorado comes from Franktown Cave, where, cornstalks, kernels (n=24) and cobs (n=5) were recovered. The presence of cornstalks argues for a local origin for the corn. A radiocarbon age of 890 B.P., 2-sigma cal range of A.D. 1020-1280 was thought to be associated with the late component at Franktown Cave. A fragment of a small, 16-row cob with cupules suggesting very small kernels was found associated with Complex B at LoDaisKa, with bracket dates of cal A.D. 540-1300. One kernel of dent corn was found associated with Complex A, which is thought to postdate 970 ± 150 B.P., 2-sigma cal range A.D. 727-1300. Unfortunately, the large sigma associated with the LoDaisKa ages coupled with the possible stratigraphic problems discussed above make interpretation of these data problematic and diminish the value of the information for defining the temporal and cultural associations of the corn. However, these data are not inconsistent with the information from sites with more reliable information. Corn was also found

at LoDaisKa in Complex D, an Archaic context with associated bracket dates of 4220-830 B.C. Given what is known regarding the antiquity of corn in archaeological contexts north of Mesoamerica, it seems highly unlikely that the corn is actually this old, and an alternative explanation such as postdepositional disturbance, misinterpretation of the stratigraphic context, or some other problem has likely resulted in this association.

The single site from which there is evidence of corn from a reliable context that does not fit the above geographic and temporal pattern is Three O'Clock Shelter in Weld County. Two fragmented kernels of Chapalote maize were recovered from Feature 6, a small, ovoid trash midden located within the hypothesized lean-to structure contained in stratigraphic Unit 7. Two features associated with Unit 7 provide 2-sigma cal stratigraphic bracket dates of A.D. 410-695. This site also has two later occupations, represented in Unit 5 and Unit 6. Unit 5 has an anomalously early radiocarbon age of 1150 B.P., 2-sigma cal range A.D. 730-1010, and Unit 6 has associated 2-sigma bracket dates of cal A.D. 880-1260.

The two other occurrences of corn from the plains of northeastern Colorado, both undated, are from Agate Bluff I and Lehman Cave. As discussed above, the single kernel of Dent corn from Agate Bluff I was attributed to the Upper Republican component at the site, although the depth from which it was recovered and the mixed association of the Upper Republican and Woodland components suggest that it could also be associated with the small Woodland component. The context of this corn should be considered problematic. The small corncob from Lehman Cave in Elbert County was excavated by collectors, and its association is unknown. The site contains Archaic, Early Ceramic/Woodland, and Late Ceramic Great Bend and Dismal River diagnostic artifacts.

The following is summarized from the discussion of *Zea mays* in Adair (1988:70-78). The lack of evidence for domesticates other than corn in northeastern Colorado sites reflects the pattern seen farther east on the Central Plains. Corn is the most common domesticate found in sites on the Central Plains, and has been recovered from nearly four times the number of sites than the next most common domesticate, sunflower (Adair 1988:Tables 3.5 and 3.6). Corn was introduced into the Southwest approximately 500-750 B.C., and all of the early examples belong to the Chapalote series, which is a small cob popcorn. There is more debate over the time of arrival of corn into the eastern woodlands, and estimates range from 500 B.C. to A.D. 400. Theories of how corn arrived in the Midwest are speculative, but the most accepted theory suggests that it came from the Southwest by way of the Southern or Central Plains. In general, evolution of corn varieties begins with those that possess higher row numbers (12-16) and are not well adapted to northern latitudes, and subsequently are not as reliable as a source of food. These varieties are supplemented (but not completely supplanted) by the introduction of eight-row Maiz de Ocho, a variety with larger kernels than older varieties that is adapted to the highlands of Central America. Maiz de Ocho was introduced into the Southwest approximately A.D. 200-700. Elements of Maiz de Ocho do not enter the gene pool of eastern varieties until late in the first millennium A.D. with the emergence of Northern Flint corn, which became the dominant variety in the Northeast, and the Upper Missouri and Mississippi River valleys. Some investigators suggest that eight-row corn could have developed in place from varieties with greater numbers of rows without necessitating the introduction of new varieties from the Southwest (Adair 1988:72-73).

The earliest dated occurrence of corn in the Central Plains is from the Trowbridge site, a Kansas City Hopewell site near the confluence of the Kansas and Missouri rivers, where a variety

of Chapalote corn found in a refuse pit was dated by ceramic seriation to A.D. 250-400. In the period that postdates the Kansas City Hopewell, ca. A.D. 500, Adair (1988) could find only five Early Ceramic (Late Woodland/Plains Woodland) sites on the Central Plains that contained the remains of corn; two of these sites have problematic dates and one is undated. All of these sites are from eastern and south-central Kansas, northwestern Missouri, and east-central Nebraska. The corn found in Woodland contexts at these sites is of a type that exhibits differences from the earlier Chapalote varieties, and suggests that the influence of eight-row corn had developed or been introduced into the Central Plains by A.D. 800-1000. Because of the paucity of evidence for use of corn during the Early Ceramic period, Adair (1988:74) suggests that the use of corn by late Early Ceramic people seems conjectural. Obviously, even if one accepts the presence of corn in these components, horticulture was a minor part of the subsistence system ancillary to hunting and gathering. By the initial Middle Ceramic period in the Central Plains, ca. A.D. 1000, corn becomes a more important part of subsistence, as demonstrated by both the number of sites from which corn was recovered and by the amount of corn recovered from individual sites dating to this period. By this time, the influx of eight-row corn into the gene pool of varieties with more numerous rows has resulted in an improved, more robust, and reliably productive variety with an intermediate row count. It is this variety of corn that becomes a more important a food source, and subsequently becomes a much greater proportion of the subsistence in cultures of the Central Plains tradition than during the previous Woodland period (Adair 1988:73-74).

Good temporal correlation exists between the components that contain corn at Bayou Gulch (cal A.D. 1020-1220) and Franktown Cave (cal A.D. 1020-1280). As was related above, the large sigmas associated with the LoDaisKa radiocarbon ages results in a large range within the bracket dates (2-sigma cal range A.D. 540-1300), and this result is not really useful for pinning down the age of the Early Ceramic corn at the site. However, these dates do not contradict the dates from Bayou Gulch and Franktown Cave, which are contemporary with Middle Ceramic cultures farther east on the Central Plains. The evidence of corn from Bayou Gulch is pollen, and the macrobotanical remains of corn from Franktown Cave have not been described in detail, so the variety of corn from these sites is unknown. The corn from Complex B at LoDaisKa has 16-rows, which suggests that it is an earlier variety. The dates associated with corn at Bayou Gulch and Franktown Cave, as well as some aspects of material culture associated with these components (bison scapula digging tool, side-notched points, obliterated cord-marked ceramics) suggest contacts with contemporaneous Middle Ceramic period populations to the east on the Central Plains, where corn horticulture at this time was relatively common compared to that of the Plains Woodland sites of the previous period. At Three O'Clock Shelter, the bracket dates of A.D. 410-700 associated with the Plains Woodland component are consistent with the presence of an older Chapalote variety of corn. However, dated evidence of corn is almost unknown during this period of time on the Central Plains. These bracket dates fall into a period that is between the few dated examples of corn associated with Kansas City Hopewell sites and the dated occurrences of corn in late Plains Woodland sites. The nearest examples of corn in Plains Woodland components are from eastern Nebraska and south-central Kansas, hundreds of miles to the east. If the context of the corn at Three O'Clock Shelter is accurately associated with the radiocarbon ages from Unit 7, and not from later components, it represents one of the earliest associations of corn with Plains Woodland people. Considering the lack of corn in much more intensively occupied Plains Woodland sites farther east where the environment and moisture regime is more conducive to horticulture, the presence of an earlier form of corn with an age that is consistent could represent a connection with the Southwest as a source instead of with more closely related cultures to the east.

Most of the documented macrobotanical remains of corn from sites in northeastern Colorado are from rockshelters, some of which are known for excellent preservation of perishable materials, and at the same time are often notorious for the problems of contexts that are compromised due to postdepositional disturbances, complicated (or unidentifiable) stratigraphy, and in some of the older excavations, methodological or interpretive problems. With the refinement of accelerator applications to radiocarbon dating that has occurred recently, the amount of material needed for an accurate radiocarbon age has become minuscule. Some of the problems associated with determining the chronology of corn horticulture with regard to chronology could be solved by direct dating of the remains themselves, especially from a site like Franktown Cave that contains relatively abundant remains. Direct dating of an annual plant such as corn would provide the most accurate age for when it was grown, as opposed to the potential problems associated with stratigraphic dates, bracket dates from features, or old wood problems. Direct dating of corn in Colorado sites could potentially place these remains from undated sites such as Agate Bluff I, Lehman Cave, and 5DA90 into the proper cultural-historical context, and the somewhat problematic contexts of corn from components with associated radiocarbon ages, such as Franktown Cave and LoDaisKa, could be clarified by direct dating.

Although the clustering of sites that contain corn south and southwest of Denver may be related in some way to the geology of the area, which has resulted in an increased number of rockshelters which in turn has resulted in an increased number of excavated sites with preservation of perishable macrobotanical materials, it may also be due to the climate of the area. Information in both Tate (1997) and Hansen et al. (1978) suggests that this area compared to the surrounding areas is subject to a mild climate. This area has a relatively high mean annual temperature without suffering extremes of cold in the winter or heat in the summer. Mean annual precipitation and mean precipitation from April to September is relatively high due to proximity to the Front Range and Palmer Divide, but the growing season (based roughly here on mean dates of last frost in the spring and first frost in the fall, and latest occurrence of frost in the spring and earliest occurrence of frost in the fall), which is also somewhat dependant on proximity to the Front Range and Palmer Divide, is relatively long compared to surrounding areas of higher elevation. Mean annual precipitation and summer precipitation in this area are still below the means cited by Wedel (1986:114) as the minimum amount of summer precipitation (20 cm [8 inches] in June, July and August) necessary to support corn. However, precipitation levels are close enough to these thresholds that corn horticulture would have been possible in years of above-average rainfall, or during periods of increased effective moisture such as that hypothesized during the Neo-Atlantic climatic episode (1260 B.P.-850 B.P.), when the climate on the plains was characterized as somewhat more moist than later in time (Wendland 1978). Brunswig (1996) and Wedel (1986) characterize this episode as continued warm, with increased moisture, resulting in increased summer precipitation. This increase in summer precipitation could have made the difference for corn horticulture, and the timing of this hypothesized increase in precipitation coincides with dates for the relatively well dated corn from Bayou Gulch and Franktown Cave, ca. 1000-840 B.P., 2-sigma cal range A.D. 1020-1280, and is not inconsistent with the bracket dates for the Late Prehistoric corn at LoDaisKa, 1260-970 B.P., 2-sigma cal range A.D. 540-1300.

- Examination of temporal and cultural variation in ceramics.

Some investigators, including Ellwood (1987) and Farmer et al. (1982) contend that Woodland ceramics can be separated based primarily on surface treatment into types that may have cultural validity. These types have even been seen as evidence of possible relationships with

Valley focus and Keith focus groups to the north and east (Ellwood 1987:135). Butler (1988) maintains that different "styles" similar to those described by Ellwood at Bayou Gulch can be found on different sherds from the same components, and in fact can sometimes be found on different portions of the same reconstructed vessels, rendering any recognition of ceramic types within the generalized category "Woodland" impossible until more detailed analysis of large, well documented and dated ceramic assemblages is published.

Stability of ceramic technology and styles in the Early Ceramic period both temporally and spatially seems to be the norm in the Platte River Basin. One of the best examples of temporal stability is found at the Senac site (O'Neil et al. 1988). Ceramics that exhibit similar manufacturing techniques, the same materials, and surface treatment were recovered from both Zones A and C, the former clustered within an activity area centered around Feature 9, with an associated age of 1070 ± 100 B.P., 2-sigma cal range A.D. 727-1201, and the latter, clustered around Feature 13, with an associated age of 1560 ± 80 B.P., 2-sigma cal range A.D. 339-654. Sherds are found throughout the cultural strata into the basal Zone F. Although sherds were not found in close association with dated features in Zone D, the age of Feature 7 provides an age for the stratum of 1620 ± 60 B.P., 2-sigma cal range A.D. 263-597. Although there is some inversion of dates at Senac, the continuity in ceramic technology was recognized, and ceramics are associated with assemblages in strata containing both arrow points and dart points.

The technological and stylistic differences between the ceramic artifacts of the Early and Middle Ceramic periods as found in the heart of the Colorado Piedmont are not as obvious as the differences between the components of these periods in sites on the margins of the Colorado Piedmont and out onto the High Plains. Several examples are available. At the Rock Creek site (Gleichman et al. 1995), the distinction between Plains Woodland and Upper Republican ceramics was primarily made based on surface treatment, and not on technology, vessel form, or the presence of collared or braced rims. Differences between Woodland and Upper Republican ceramics at Box Elder-Tate Hamlet were determined based on technological criteria, many that were not made explicit, and on debatable morphological characteristics. The form of the Upper Republican vessel was defined based on traits that were either only suggested or not present in the limited collection of sherds, but were "expected to be present" on the vessel by the analyst (Johnson and Parker 1992:327). These elements, such as the rim, neck, shoulder and base were incomplete or actually missing (Johnson and Parker 1992:327-328). Stylistic and technological changes, such as the presence of "Upper Republican paste," could in actuality represent a continuum of variation through time and the incorporation of new manufacturing techniques acquired through diffusion within an established technology used by indigenous people, as opposed to representing actual population movement and culture change. The descriptions in many reports of tempering materials, clay and paste, and how they change over time are sometimes too subtle for the nonceramicist to discern the difference. Without significant morphological/stylistic or technological changes, determination of cultural affiliations based on subtle changes in vessel size, minor technological changes or changes in surface treatment alone seems unjustified. Technologies are adopted cross-culturally, but stylistic elements represent a cultural identity above and beyond technology. Use of the designation "Upper Republican" when describing these late Early Ceramic/early Middle Ceramic components in the western Colorado Piedmont seems inappropriate or at least premature. Although many have pointed out that the use of the term "Woodland" in relation to the Early Ceramic people in the Colorado Piedmont is itself inappropriate, the Plains Woodland and other Woodland manifestations in the Central Plains are demonstrably part of a cultural pattern that seems to have both greater temporal depth and spatial

magnitude than does the Upper Republican pattern, which is usually designated as a phase or another taxon with similar limited spatial and temporal range.

None of the Colorado Piedmont components along the Front Range described as "Upper Republican" seem to contain the classic collared or even flared rim, ceramics associated with the undisputed Upper Republican components. Vessel morphology seems to fall within the range of variation of Plains Woodland types, with mostly direct rims, vertical or diagonal cord marks, and perhaps the development of slight shoulders. The presence of globular vessels is based on relatively meager evidence, such as the presence of one rounded basal sherd at the Moffit site (Tucker 1994). The differences between pre-A.D. 1000 ceramics and later ceramics in sites on the Colorado Piedmont are technological innovations such as thinner vessel walls and a higher incidence of obliteration of cord marks. Although no comprehensive work has been done on the location of clay sources in the Colorado Piedmont, the evidence does suggest that the ceramics from these transitional Early/Middle Ceramic sites are manufactured using local clays (Ellwood and Parker 1995). The only evidence of classic Upper Republican ceramics in the Piedmont is one collared rim sherd at Franktown Cave and one "possibly intrusive" collared rim sherd at Cliff Swallow Cave. The only documented components with "classic" Upper Republican ceramics are sites situated at the Colorado Piedmont/High Plains margin, such as J. J. Wood's (1967) sites in Weld and Logan counties, the Agate Bluff sites, Happy Hollow Rockshelter, Smiley Shelter, and Buick Camp, which are all situated at or near the High Plains Escarpment.

- Documentation of demographic trends and variation.

As discussed above in Paleodemography, there is an increase in radiocarbon ages that begins in the third century B.C. and peaks between the sixth and eighth centuries A.D. It declines until reaching a plateau of similar amplitude in the fifteenth century as that observed before the almost exponential increase during the latter part of the Late Archaic period and the beginning of the Early Ceramic period.

- Documentation of cultural boundaries.

This question is difficult to answer in light of the arguments of Butler (1988) for the qualified rejection of all cultural taxa previously proposed as subdivisions of the Early Ceramic period until sufficient data are collected to define these subdivisions in a meaningful and mutually exclusive way. This situation makes the recognition of both diachronic and synchronic cultural/geographic boundaries somewhat speculative.

In recent work, the term "Hog Back Phase" as defined by Nelson (1971) and further refined by Benedict (1975b, 1975c) has for the most part fallen out of use as a phase concept. One could assume that this is due to the above-described difficulty of defining a phase separate from the generalized Early Ceramic cultural pattern in the Platte River Basin, based on the temporal and cultural criteria outlined by Willey and Phillips (1958). Recently, Benedict (1992, 1993) has used the term "Hog Back Complex," a more generalized term than the more rigorously defined "phase," and this concept has been used by others working in the area (i.e., Gleichman et al 1995). In more recent work, Benedict (1996) avoids the use of the term "complex" and refers to this groups as "Hogback people," or the groups that used Hogback Corner-notched projectile points, without attribution to a complex. In his earlier work Benedict (1975b, 1975c) had suggested that instead of representing a mountain-oriented variant of the Plains Woodland culture, the Hogback phase could

be interpreted as representing mountain-adapted Shoshonean groups that acquired Woodland pottery through trade. More recently, Benedict (1990:64) acknowledged that because of the wide spread occurrence of Hogback Corner-notched points both within and on either side of the Rocky Mountains, they cannot be considered culturally diagnostic. However, the validity of the Hogback complex as a concept used to guide further investigation of this cultural phenomenon is not in question. It has been demonstrated that a group of Early Ceramic people participated in a rotary transhumant subsistence-settlement system based within the hogbacks/foothills transition zone and mountains, and that these people utilized communal game drives on the crest of the Front Range, and that they possessed a material culture assemblage, including small, often serrated, corner-notched projectile points and cord-marked pottery, similar to those in use farther east by nonmountain-oriented Early Ceramic groups. The cultural or ethnic relationship between the Hogback complex and other Early Ceramic groups requires further definition based on additional research. The geographical boundary of this complex is close to the hogbacks/foothills transition zone, and may extend east from the hogback several miles. The Early Ceramic component at the Rock Creek site in southeastern Boulder County is thought to represent the Hogback complex, and it is located approximately 16 km (10 mi) east of the hogbacks/foothills (Gleichman et al. 1995).

The Franktown phase, if it could be considered tentatively as a useful cultural taxon, seems to be centered in the northern Palmer Divide and hogbacks southwest of Denver in the drainage basins of Cherry Creek and Plum Creek. Additional data, including but not limited to information on culturally diagnostic artifacts such as projectile points and ceramics, subsistence differences and the importance of horticulture, and additional absolute dates must be collected and analyzed if this cultural taxon is to be defined.

The single relatively obvious cultural boundary based on current information is between the transitional Early Ceramic and Middle Ceramic groups in the Colorado Piedmont that seem to overlap in time with Upper Republican occupation of the High Plains escarpment (see Middle Ceramic research questions below). As was pointed out above in the discussion of the research question dealing with variation of ceramics over time, the well-documented components whose artifact assemblages reflect a cultural relationship with the Upper Republican sites in Kansas and Nebraska seem to be limited to the margins of the High Plains, with many of these components situated in rockshelters eroded from the scarps of the early Tertiary sedimentary rocks that define the boundary of the Colorado Piedmont and the High Plains. The distribution of these documented sites could be due to a number of factors. The edge of the High Plains could have been a prehistorically recognized geographic/cultural boundary, or the distribution could simply be a factor of the formation of rockshelters in areas where the geology favors this process, such as at the edge of the High Plains under the caprock. Other possibilities include the relative desirability of rockshelters as campsites by prehistoric people versus other locations, or the desirability of rockshelters as excavation projects by archaeologists. Obtaining radiocarbon ages from undated Upper Republican sites in this area such as Smiley Shelter and Buick Camp could provide information important to the investigation of this question.

- Examination of external relationships.

Information pertaining to this question is presented below in the research problem section General Late Prehistoric Stage, Influences from the Northwest and Central Plains.

Middle Ceramic Period

The following section incorporates the Research Problems for the Middle Ceramic period, as suggested by Colorado archaeologists (Eighmy 1984)

- Establishing the taxa and locations of prehistoric cultural groups.

As the number of excavated large Early Ceramic campsites increases, it has become obvious that previous concepts of the temporal extent of this period are in need of revision. Previous cultural overviews such as those of Butler (1986) and Brunswig (1996), as well as the present study, suggest the need to recognize that the Early Ceramic period in the northeastern Colorado Piedmont, especially along the foot of the Front Range, should be extended to ca. A.D. 1150. This yet unnamed "transitional" or "terminal" Woodland or Early Ceramic cultural unit may qualify as a phase or subphase that is transitional between the Early and Middle Ceramic periods, and apparently represents an in situ cultural development within indigenous groups of people that is partially defined by a persistence of the Early Ceramic cultural pattern that begins to incorporate aspects of Middle Ceramic technology. The latter include the introduction of side-notched point types and ceramics that seem to reflect improvements in technology and changes in exterior treatment but not in vessel shape. Changes and improvements include thinner, harder wares with "Upper Republican" paste, partially to completely obliterated cord marks, introduction of slipped vessels and possibly an increase in decoration. This late Early Ceramic period cultural unit is represented at sites such as Rock Creek, Box Elder-Tate Hamlet, Bayou Gulch, Franktown Cave, Jarre Creek and Cliff Swallow Cave, and in other sites that have previously been assigned to the "Franktown focus"or its variations. Components in the northern Palmer Divide that have previously been characterized as "Franktown focus"may belong to this transitional period, although a cursory examination of collections at the University of Denver from excavated but unreported sites suggests that continued investigations may eventually result in the definition of a separate subphase congruent with the Franktown focus. This would validate Withers (1954) tentative definition of a cultural taxon that was based on his unpublished investigations of several components in and around the Palmer Divide. The evidence suggests that these late Early Ceramic/Plains Woodland people living on the Colorado Piedmont, and the Upper Republican people of the High Plains were occupying adjacent areas contemporaneously, or at least during an overlap of approximately 150 years. This late Early Ceramic manifestation may eventually require a new taxon in order to deal with the potentially confusing situation of having two cultures (Plains Woodland and Upper Republican) that by definition are assigned to successive temporal units (Early and Middle Ceramic periods) apparently existing contemporaneously in adjacent areas (Colorado Piedmont and High Plains).

The sites that were once classified by J. J. Wood (1967:636) as "site unit intrusions" by groups of Upper Republican people from the Central Plains on the High Plains are now thought to represent year-round occupation of the area by these people (Roper 1990; W. R. Wood 1990). The Upper Republican frontier on the High Plains of Colorado is characterized by sites such as Happy Hollow Rockshelter, the Agate Bluff sites, several Renaud sites, Peavy Rockshelter, Biggs site, Buick Camp, Smiley Rockshelter and the Friehauf site. The only "classic" Upper Republican material culture found in quantity is almost exclusively limited to sites close to or actually on the High Plains. Although both Franktown Cave and Cliff Swallow Cave apparently contained one rim sherd from collared, flared-rim vessels, caution should be used in defining the presence of a

component based on a single artifact as opposed to explaining the occurrence of these artifacts as a result of trade with contemporaneous groups to the east.

The presence of plain ware ceramics, most attributed to Intermountain ware, has been used to suggest the presence of Numic speakers in the Front Range area, both in the hogbacks/foothills and on the plains. Dated components with plain ware, punctate, or fingernail-impressed ceramics attributed even tentatively to Intermountain ware include Graber Cave, with an associated age of cal A.D. 1270-1436 (Nelson and Graeber 1984); 5AH417, with a thermoluminescence date of A.D. 1520 (Joyner 1989); T-W Diamond, with associated dates of 357 cal B.C.-cal A.D. 1627 (Flayharty and Morris 1974); 5AH15, with an associated date of cal A.D. 1321-1631 (Gilmore 1991a); LoDaisKa Complex A, with an associated date of cal A.D. 727-1300 (Irwin and Irwin 1959); Van Bibber Creek Zone A, with an associated date of cal A.D. 541-1408, and an obsidian hydration date of A.D. 1150 (Nelson 1969); and Echo Cave, with an associated date of cal A.D. 1216-1427 (Brunswig 1990b). Undated components include 5AH474 (Gilmore 1991a), 5WL41 (Wood 1967); Cherokee Mountain Rockshelter (Nelson and Stewart 1973), Magic Mountain (Irwin-Williams and Irwin 1966); Bayou Gulch (Gilmore 1991b); and Roberts Buffalo Jump (Witkind 1971). In the mountains, plain and punctate/plain ceramics were recovered from possibly from the same component at the Caribou Lake site, just over the divide in Grand County in the Upper Colorado River basin, provided an AMS date of soot from one of the punctations of 655 ± 80 B.P., 2-sigma cal range A.D. 1218-1429 (Benedict 1985a, 1989). Both Intermountain tradition ceramics and finger tip- and fingernail-impressed wares were found at the ceremonial site of Old Man Mountain, 5LR12 (Benedict 1985b). One site in North Park (5JA262) contained 59 plain, gray ware body sherds and one rim sherd thought to be Intermountain ware. The rim sherd has a slightly rounded exterior lip and a flat, smoothed rim; the temper of the sherds was very coarse sand. No description of vessel shape was hypothesized due to the small size of sherds and small percentage of the vessel represented (Lischka et al. 1983:184-185). "Shoshonean" sherds were also collected in South Park; some of these were plain ware, and some were fingernail-impressed (Nelson 1969)

Determining settlement patterns and cultural affiliations from such a small sample is difficult. The usefulness of a general cultural assignment to a Numic group that is based only on the presence of plain ware ceramics (and only a handful of sherds or less at most of the above sites) is problematic, if not unfounded. Only a few of the above sites contain enough material to determine vessel morphology or manufacturing techniques, both of which are as valuable (if not more so) as diagnostic traits as a lack of surface decoration.

- Establishing the relationship between archaeological and presumed cultural units.

There is still too little information available to answer this question. In the Early Ceramic period, several hypothesized subcultures that have yet to be adequately defined to distinguish them from a general Early Ceramic affiliation, although as was stated above, an increasing amount of information is available regarding the Hogback complex. Support is lacking, however, that this cultural manifestation represents Shoshonean people who have adopted the ceramic technology of Plains Woodland groups or have acquired these ceramics through trade as was first hypothesized by Nelson (1971) and Benedict (1975b). This theory is in opposition with the majority of opinion regarding the hypothesized timing of the Numic spread from their ancestral homeland through the Great Basin and Colorado Plateau into the Rocky Mountains. Although there is no consensus of when the Numic Expansion began, most of the theories are consistent with an arrival in the

Colorado Plateau between A.D. 800 and 1000 (Madsen and Rhode 1994). The appearance about A.D. 1000 on the western slope of the Rocky Mountains of material culture of what are likely Numic people is represented in the post-Formative period in eastern Utah and western Colorado by the presence of an artifact assemblage containing brown ware ceramics, diagnostic projectile points (Desert Side-notched and Cottonwood Triangular types) and shouldered bifaces with round bases and straight to concave blade edges known as "Shoshonean knives" (Reed 1994). Components with diagnostic, flat-bottomed Intermountain ware ceramic vessels or plain ware sherds thought to be Intermountain ware at a few sites in the northern Colorado mountains and hogbacks/foothills may indicate the presence of Shoshonean people in the area. It is unknown what the duration of these occupations was or whether these sites indicate ongoing habitation or the adoption of Intermountain ware by other groups, such as the linguistically related Ute. However, these technologies are distinct from the technologies associated with Hogback complex components, which most resemble the generalized Plains Woodland sites throughout the eastern part of the state. If the Hogback complex did in fact represent the pre-A.D. 1000 to 1200 Shoshonean occupation of the Front Range, it would be logical to expect that their material culture would reflect similarities with groups to the west instead of having a remarkable similarity to the material culture of an ethnically distinct people whose affiliation lies with plains groups to the east. It seems equally unlikely that after A.D. 1000-1200, these people would adopt a significantly different material culture that is associated with Numic populations to the west, or disappear only to be replaced by linguistically related people with different technologies and subsistence and settlement patterns. It is more reasonable to suggest that the people participating in the settlement and subsistence pattern that archaeologists have called the Hogback phase or complex may be indigenous mountain-oriented groups who represent an ethnic division within the indigenous, prehistoric populations of eastern Colorado who adopted Plains Woodland technologies as well as other cultural attributes such as burial ritual.

- Studying settlement-subsistence patterns.

Information pertaining to this research problem can be found above in the Settlement and Subsistence subsections under Theoretical Considerations.

General Late Prehistoric Stage

The following general Late Prehistoric stage research problems were suggested by the compilation of the Plains Prehistoric Context (Eighmy 1984).

- Independent dating for finer chronological control.

It goes without saying (but invariably is said anyway) in any large overview that more data are needed to fully address research problems, and one of the most often-cited domains is the need for more and better dates to strengthen conclusions or to test hypotheses. Even though more radiocarbon ages fall within the Late Prehistoric stage than in any other period of time, more and better dates from good contexts are needed in addition to continued analysis to define the subdivisions within the Early and Middle Ceramic periods.

- Influences from the Northwest and Central Plains.

As mentioned above, there must have been something powerful and compelling about the Hopewellian culture and it's western Plains Woodland variants-what other cultural manifestation was so widely disseminated other than the fluted point Paleoindian cultures? The ideas (most now lost except for technological innovations and burial practices) must have been powerful to be adopted by indigenous populations. The assumption is that the changes represented by the Plains Woodland culture, especially in Colorado, are apparently the result of an influx of ideas and not of people. Wedel (1986:81) described the differences between the upper and lower Republican River valley as the "somewhat more limited material culture inventory" of the Woodland sites farther west. If the Woodland manifestation in eastern Colorado represented actual migration of people from the east, one would expect a greater diversity of artifact types and greater similarity between assemblages from Colorado and the east, especially to particular groups or phases. The problem with attribution of influence of Woodland material culture from Colorado to any one phase is that the Colorado material does not relate to any particular pattern; it is just a highly simplified and generalized Woodland pattern. What makes detachment of the Colorado Plains Woodland-like culture from its eastern relatives so difficult is that no disjuncture of cultural attributes is apparent, but simply a gradient of decreasing complexity in artifact assemblages from east to west.

In Colorado, versus the pattern observed on the Central Plains and farther east, no significant changes occur between the Late Archaic and Early Ceramic periods in settlement pattern or overall technology other than the addition of a few artifact types (e.g., cord-marked ceramics, small corner-notched arrow points and possibly expanded base or flanged drills). There is an increase in number of components, which is a phenomenon also observed in the Plains Woodland heartland (Wedel 1986:81), and most likely does reflect an increase in population. However, as was said above, if not for the similarities in burial patterns, the few similarities with eastern groups could possibly be dismissed as the acquisition of a few new and useful technologies by indigenous people. But the similarity in burial pattern between Colorado and the Woodland Keith focus of the Republican River valley does suggest that the Woodland people of Colorado did more than just borrow the idea of ceramics; it suggests that they had a cultural identity with people to the east. The western margin of Woodland and Woodland-like cultures extends from Montana south through Wyoming, Colorado, northeastern New Mexico and into the Texas panhandle. Gunnerson (1987) asserts that calling sites on the Front Range "Woodland" is to expand the taxon to an absurd limit. This is perhaps true. However, with a relatively low gradient of trait loss between here and the area occupied by the unequivocal Woodland cultures in the Central Plains, where would anyone propose to draw the line?

Although the bow seemed to arrive almost coincidently (on an archaeological time scale) with ceramic technology, it may be a mistake to assume that this technology was diffused from the east along with ceramics. This may be the case, but other sources such as the Northwest Plains or Great Basin should be investigated. The persistence of dart points to the exclusion of arrow points seems to be represented in some components in the mountains (Benedict 1990), which suggests that the source of this technology may be to the north and not over the mountains.

As discussed above, influences from Central plains are reflected in the ceramic and lithic technologies found in Middle Ceramic components in eastern Colorado. Side-notched points, and thin sherds from smaller vessels with "Upper Republican paste" have been recovered from components dating to the Middle Ceramic period. A small number of projectile points similar to Avonlea points recovered from Early and Middle Ceramic components may indicate contact with groups or influences originating from Northwest plains. Most of these points are manufactured

from lithic materials available on the plains and hogbacks/foothills. However, there is currently insufficient data regarding these artifacts to determine whether they represent contact with the Northwest plains or represent variation within the point styles of groups indigenous to Colorado.

- Subsistence-settlement differences between the Early and Middle Ceramic Periods.

As was stated above, little difference is noted in settlement and subsistence between Early and Middle Ceramic periods, especially in the Colorado Piedmont. Differences in settlement patterns are best exemplified by the distribution of rockshelters and a few open sites at the edge of the High Plains that contain extensive Middle Ceramic occupations with comparatively less evidence of Early Ceramic occupation. Although the artifact assemblages associated with these Upper Republican occupations are considered to be abbreviated versions of the assemblages found in villages in Nebraska and Kansas (Irwin and Irwin 1959; W.R. Wood 1971a), the cultural material is comparable to that found in those villages. Many of the assemblages in Colorado represent repeated use of the location or several extended occupations. As people who were part of a semisedentary horticultural group that now found themselves relying completely on a hunter-gatherer economy, one could reasonably assume that their subsistence and settlement system would be closer to the collector end of the collector/forager continuum, as food production obviously goes hand in hand with storage capability. In contrast, the relatively less extensive occupational debris associated with Early Ceramic components in the area may represent field camps or residential base camps within a less logistically organized forager subsistence and settlement system, similar to that thought to be represented at the Cass site (Kalasz et al. 1992). Of course, these perceived differences could also be a result of the small sample size of well-documented Late Prehistoric sites on the High Plains in northeastern Colorado.

Based on several lines of evidence and contrary to previous characterizations of these sites as representing site intrusions by hunting parties from villages to the east (J. J. Wood 1967; W.R. Wood 1971a), Upper Republican sites on the edge of the High Plains are more accurately characterized as representing resident Upper Republican groups whose subsistence and settlement system was probably based on a hunter-gatherer economy utilizing diverse resources instead of food production (Roper 1990; Wood 1990). It is unknown why these people did not seem to penetrate farther into the Colorado Piedmont, but occupation of the Piedmont by hostile groups or utilization of local resources particular to the High Plains are possible explanations (Wood 1990). Further investigation of this question is warranted.

- Relationship between the Late Prehistoric Stage and the Archaic Stage on the one hand and the Protohistoric on the other.

The transition between the Late Archaic and the Early Ceramic periods would have been relatively smooth, as might be expected with the introduction of new technologies and other ideas to an indigenous population. Other than the introduction of ceramics and the bow, there is no major disjuncture of technology or subsistence or settlement patterns, which might be expected if there was an actual influx of population. The radiocarbon curve (see Figure 1-2) indicates that the number of ages, possibly reflecting population trends, begins to increase 300-400 years before the beginning of the Early Ceramic period. This may indicate that the increase in population hypothesized for the Early Ceramic period actually began prior to the arrival of ceramics and the bow, suggesting that these innovations were not the catalyst to population increase.

Small, thin projectile points with narrow haft widths suggesting use as arrow points in contexts with seemingly reliable early radiocarbon ages have been recovered from Box Elder-Tate Hamlet (Tucker et al. 1992), with an associated age of 1610 ± 90 B.P., 2-sigma cal range A.D. 240-640. At the Senac site (O'Neil et al. 1988), small, corner-notched points and corner- and side-notched dart points co-occurred in artifact concentrations associated with Feature 13, 1560 ± 60 B.P., 2-sigma cal range A.D. 339-654 in Zone C, and associated with Feature 7, 1620 ± 60 B.P., 2-sigma cal range A.D. 263-597 in Zone D. Cord-marked sherds also were associated with these points in all of these levels, as well as in Level 19 in Zone F, with an anomalously young associated radiocarbon age of 1330 ± 70 B.P., 2-sigma cal range A.D. 608-881. If the burial dated 1800 ± 110 B.P., 2-sigma cal range 2 B.C.-A.D. 532 at the Michaud A site and is really associated with the overlying occupation level, then this date represents the earliest occurrence of small, corner-notched arrow points and cord-marked ceramics in eastern Colorado. However, the occupation level may incorporate multiple components, and no points or ceramics were in direct association with the burial, so this association and the conclusions derived from it should be viewed with caution.

An undecorated brown ware sherd and the tip from a "Woodland-looking" projectile point from a component with an incongruously early associated radiocarbon age of 2140 ± 200 B.P., 2-sigma cal range 772 B.C.-A.D. 329 at the Indian Mountain site (5BL876), may be one of the earliest dates associated with ceramics in the Central Plains (Cassells and Farrington 1986). At the time they were writing, the closest site with a ceramic component dating this early was a Valley Phase Woodland site on the Missouri River in Kansas. Cassells and Farrington (1986) present several plausible trade or diffusion scenarios to explain the early context of these artifacts. However, some caution should be exercised before this context of the date with the artifacts is accepted. The association of the radiocarbon age with the stone ring from which the sample was derived is probably valid, but the artifacts are not necessarily associated with the feature. Additional data from less ambivalent contexts are necessary to support this interpretation. Evidence of the presence of the bow and ceramics in Colorado from components with early ages in well-stratified sites or more deeply buried, single-component sites is needed before accepting this interpretation of a shallow, multicomponent site, especially one that also contains a component with uncontestable Early Ceramic radiocarbon ages from features within 50 m (160 ft) of the artifacts in question. The 2-sigma range for the calibrated date also brings the upper part of the range well into the Early Ceramic period, so the explanation may be as simple as the actual date of the component occurring in the tail of the probability distribution for the calibrated date.

- Projectile point typology including a consideration of the taxonomic position of serrated points.

Butler's (1986) Type 2, Magic Mountain Corner-notched points (a.k.a. Hogback Corner-notched and Gilmore's [1991b] Type 8a) have been recovered from contexts with relatively high confidence that the artifacts are associated with the dates. Although no Magic Mountain Corner-notched points are directly associated with radiocarbon ages at Bayou Gulch, similar points found at sites along the Front Range and into the mountains have associated ages of 1260 ± 95 B.P., 2-sigma cal range A.D. 626-990, at the Scratching Deer site (Benedict 1975c); 970 ± 100 B.P., 2-sigma cal range A.D. 885-1279, at the Murray site (Benedict 1975b); 1050 ± 250 B.P., 2-sigma cal range A.D. 541-1408, for Zone A at Van Bibber Creek (Nelson 1969); 1260 ± 150 B.P., 2-sigma cal range A.D. 538-1037, and 1150 ± 150 B.P., 2-sigma cal range A.D. 627-1218, for Type aa points at LoDaisKa (Irwin and Irwin 1959); 1220 ± 60 B.P., 2-sigma cal range A.D. 670-974,

for points at Dutch Creek (Gilmore 1989b); 1290 ± 100 B.P., 2-sigma cal range A.D. 599-979, for Type II points at Willowbrook (Leach 1966); and bracket ages of 3095 and 1315 B.P. for Types 19, 15 and 13 at Spring Gulch (Kainer 1976).

Butler's Type 1, Bayou Gulch Corner-notched (Gilmore's [1991b] Type 8b) points have also been recovered from contexts where there is a relatively high confidence that the artifacts are associated with the dates. At Bayou Gulch (Gilmore 1991b), Bayou Gulch Corner-notched points were found in direct association with features from which radiocarbon ages were recovered. Two Type 8b points were found in Feature 19, with an associated averaged age of 895 ± 36 B.P., 2-sigma cal range A.D. 1032-1245, and one Type 8b point was found in direct association with Feature 3, with an associated radiocarbon age of 1050 ± 60 B.P., 2-sigma cal range A.D. 989-1226, or an averaged age of 2-sigma cal range A.D. 979-1159 for the component represented by Features 1 and 3. A similar point was found at the single-component Jarre Creek site (this report), with an associated radiocarbon age of 900 ± 250 B.P., 2-sigma cal range A.D. 654-1473 (Scott 1963). These dates suggest that Magic Mountain Corner-notched points may have occurred earlier in the archaeological record than did Bayou Gulch Corner-notched points, but there is a still a large temporal overlap between the two types. Bayou Gulch Corner-notched points may be a transitional form associated with the terminal Early Ceramic Franktown focus-like components along the base of the Front Range and in the northern Palmer Divide. Benedict (1990) suggests that Hogback Corner-notched points have been recovered from components in the mountains dating from 1430 to 765 B.P., and at Rock Creek, Hogback Corner-notched points are associated with ages from features as late as 850 ± 70 B.P., and were the "dominant and preferred type" until ca. A.D. 1200 to 1300 (Gleichman et al. 1995:124). Butler (1986) lists dated components for both Type 1 (Bayou Gulch Corner-notched) and Type 2 (Magic Mountain Corner-notched) points, and these two types appear to share a extensive temporal overlap.

The Hogback phase (Nelson 1971), and the almost identically defined Parker focus (Withers 1954) or Parker phase (Wood 1967), does represent a recognizable pattern. There is no question that the redefined Hogback complex has been proven to be a valid cultural taxon (Benedict 1992; 1993; Gleichman et al. 1995). However, the other cultural patterns recognized by archaeologists in the past have so far defied meaningful definition. At this time insufficient evidence precludes the use of cultural taxa that cannot be defined with unique characteristics indicative of a specific adaptation reflected in settlement pattern, site structure, and material culture. Butler (1988) and Eighmy (1984:91) were right in stating at the time that there was insufficient objective criteria to formulate a compelling argument for the recognition of phases or subphases in the Early Ceramic period in the Platte River Basin.

Although Gleichman et al. (1995) agree with Butler's (1986) assertion that the Hogback phase as defined by Nelson (1971) is not taxonomically distinct from other Woodland manifestations, they believe that Nelson is correct in his perception of a cultural phenomenon. Data recovered since Nelson first defined the Hogback phase seem to confirm this conclusion. Recent work in the mountains and at the foot of the Front Range indicates the existence of an archaeological complex of sites representing a group of people with mountain/hogbacks/foothills-oriented subsistence and settlement patterns distinct from contemporaneous groups with a plains-oriented economy. The cultural connection of these contemporaneous plains- and mountain-oriented groups is one of the interesting questions in need of an answer.

Determining the significance of the increase in the relative frequency of serration in Early Ceramic projectile point assemblages as one approaches the mountains has been a concern of archaeologists for in eastern Colorado for some time. This attribute was thought to be culturally diagnostic and has been used as a defining trait of several cultural taxa. In his original definition of the Hogback phase, Nelson (1971) states that 50 percent of the point assemblage at the Lindsay Ranch site exhibits serrated blade edges. Eighmy (1994) points out that the frequency of serrated points in late Woodland components increases with proximity to the hogbacks/foothills-plains boundary. Between 20 and 25 percent of the small, corner-notched projectile points in Early Ceramic components in the Colorado Piedmont have serrated blade edges, where in hogbacks/foothills components 40-50 percent of the total have serrated edges (Eighmy 1994:229). Does this variation indicate a cultural difference between contemporaneous groups of people inhabiting different geographic areas with different environments? Is it a difference in technology related to function between tool types used in different environments by the same group of people? Is it an indication of a symbolic difference between the mountains and plains that is manifested in a difference in technology? Warburton and Duke (1995) provide examples from the ethnographic record of the Blackfeet of the symbolic importance that arrows (and by extension arrow points), contained within both the day to day actions of the natural world and ritual and myth of the supernatural world. Instead of being evidence of a functional/cultural difference, the observed difference in the frequency of projectile point serration in this context could be symbolic in nature, reflecting where the points were manufactured, with the application of serration to points manufactured in the hogbacks/foothills and mountains, and the lack of serration in points that were manufactured east of the mountain front. Perhaps serration could even be iconic in nature, representing the mountain origin of the artifact versus the unserrated blade edges of the projectile point manufactured on the plains. These examples are not necessarily meant to be taken as serious interpretations of the symbolic content of serration, but are instead meant to point out the possibility that some of the assumptions made by archaeologists regarding what appear to be technological differences may have other meanings not related to technology, and that these meanings may not be knowable within a traditional scientific outlook.

Because of the similarities between Hogback complex material culture and the material culture of other Early Ceramic period sites, it is difficult to determine the difference based on material culture alone, and this is especially difficult considering the possible overlap in ranges between the Hogback complex groups and other Early Ceramic period groups not participating in the same subsistence-settlement pattern. These problems make determining the cultural or ethnic relationship between Hogback complex and other contemporaneous groups inhabiting eastern Colorado problematic.

- Pottery typology particularly in the Early Ceramic period. Questions regarding differences between the ceramics of the Foothills and the South Platte areas, change through time, production by indigenous peoples, and affiliation of fingernail impressed pottery will need to be asked.

Early Ceramic pottery, and indeed, Middle Ceramic pottery in the Colorado Piedmont represent a ceramic tradition with relatively great areal breadth and temporal depth. Two few data are available to answer questions of variation in ceramics of the Early Ceramic period in the Platte River Basin. Obliteration of cord marks and slight changes in vessel morphology are the only indicators of late Early Ceramic period/transitional Early Ceramic-Middle Ceramic period ceramics, but otherwise the same clay sources, the same tempering materials and the same

manufacturing techniques are in use from the Early Ceramic into the Middle Ceramic period (Ellwood and Parker 1995). Ceramics are discussed in greater detail above in Research Questions.

Fingernail-impressed pottery is usually assigned to Uncompahgre brown ware (Buckles 1971), and no dated examples of this type are known in the Platte River Basin. However, two dated examples are known of a variation of fingernail-impressed pottery, where a stick or tool is used to form punctations on the vessels surface. A partial vessel with a punctate surface treatment was found at site 5AH417 in Arapahoe County, in the plains subarea (Joyner 1989). A thermoluminescence date of A.D. 1520 was associated with this vessel. A vessel with a punctate surface treatment was recovered from excavations at the Caribou Lake site (Benedict 1985a), which is actually several hundred meters outside the Platte River Basin across the Continental Divide in the Colorado River Basin. A sample of soot taken from one of the punctations returned an AMS radiocarbon age of 655 ± 80 B.P., 2-sigma cal range A.D. 1218-1429 (Benedict 1989). The cultural affiliation of plain ware ceramics and Numic occupation of the Platte River Basin is discussed in greater detail above in Research Questions.

- Paleoenvironment and variation in climatic conditions.

Paleoenvironment is discussed both in Chapter 2 and in the Paleoenvironment section under Theoretical Concerns above.

- Position of stone ring structures in the cultural taxa of the Middle Ceramic period.

Two Middle Ceramic period stone circle sites with dates directly associated with the circles are presently known for the Platte River Basin. Radiocarbon ages and diagnostic artifacts from the T-W Diamond site suggest that Early and Middle Ceramic components may both be present. The Hilltop site contains a stone circle (Feature 1) that may postdate 700 B.P. Stone circles at the Indian Mountain site have associated Early Ceramic and Late Archaic ages. A stone circle at the Valley View site postdates 1840 B.P. The difficulty of obtaining reliable dates from stone circles, which are usually shallowly buried on multicomponent sites makes interpretation difficult. This is compounded by the paucity of temporally or culturally diagnostic artifacts on many of these sites in eastern Colorado. At present there is insufficient data to determine any specific temporal or cultural associations with stone circle sites, let alone how these features relate to Middle Ceramic taxonomy. Based on the small amount of information available, stone circle sites date between the Late Archaic and Middle Ceramic periods, and additional data will no doubt expand this range.

- Types of structures in use.

Brunswig (1996) divides Early Ceramic habitation structures in the Platte River Basin into four subclasses: stone rings; rockshelter lean-to walls; sub-rectangular stone wall structures; and shallow pit structures. These types of structures are apparently unassociated with any particular subarea, and are likely related to the availability of construction material. Although there are many more examples of Early Ceramic architecture than when Eighmy (1984) first discussed this topic, too few examples of prehistoric architecture are documented to begin to discuss trends in the data. Little is known of habitation structures outside Colorado, although Grange (1980, cited in Adair 1988) describes several round, basin-like pithouses at the Doyle site (25RW28), a Keith variant Woodland site with associated radiocarbon ages of 1430 B.P. and 1370 B.P. These houses

were approximately 4.0 to 5.5 m in diameter and contained interior hearths and concentrations of burned rock; and some contained subfloor burials. There was no evidence for posts or superstructures.

Benedict (1975b, 1996) has reported on numerous game drive structures that were used during the Early Ceramic period. Many of these structures were in use from the Early Archaic through Middle Ceramic periods.

- Formation processes of Late Prehistoric sites, the rate of site destruction, and nature of site transformation. These last questions seem particularly important from the management point of view.

Open sites and some rockshelters dating to the Late Prehistoric in the hogback valleys and plains are found in buried contexts most often within deposits of late Holocene alluvium in the valleys of smaller perennial and intermittent streams. This alluvium is often classified as post-Piney Creek alluvium (Scott 1963). The visibility of sites in alluvial contexts is highly dependent on geomorphology and paleoenvironmental conditions influencing aggradation and erosion within individual drainage basins. No doubt many sites are buried in alluvium (or other sediments) and have no surface expression and are not exposed in cross section in terrace scarps or by other natural or human-caused disturbance. It is highly unlikely that sites in these contexts could be discovered through traditional pedestrian surveys. These sites are potentially vulnerable to destruction during construction unless archaeological monitors or observant and sympathetic construction personnel are present when they are uncovered during construction, as was the case with the discovery of the Massey Draw site (Anderson et al. 1994). Alternately, a proactive approach using remote sensing or other site prospecting techniques such as coring or trenching can be used in areas with high probability of the presence of sites, as was the case in the discovery of the Dutch Creek site (Gilmore 1989b), which was discovered through coring after the accidental discovery of the Massey Draw. These sites are both located between 150 and 200 m downstream from where their respective drainages cut through the Dakota hogback in areas that are buried in alluvium deposited as the stream channels experienced concomitant decreases in gradient and in the competence of the stream to transport sediment as they exited their relatively straight, higher-gradient channel through the resistant bedrock of the hogback. Late Prehistoric sites are also found buried within thin sheets of late Holocene eolian sand that have been periodically active during the past 2,000 years. Some rockshelters are isolated from fluvial processes, and are instead buried within colluvium deposited by low-energy processes such as sheet wash and granular mass wasting of the sandstone in which the shelter is situated. Of course, in some of these shelters mass wasting has also resulted in the deposition of boulders weighing thousands of kilograms, resulting in destruction of parts of these sites. Obviously, consultation by a geomorphologist is important in these situations. A basic understanding of geomorphology by archaeologists is useful and can be crucial.

Sites within the mountains are found in contexts similar to those described above, and in addition, high-altitude sites are often buried in thin deposits of loess and colluvium. These sites are subjected to destructive processes related to high moisture and extreme conditions within the high altitude environment, such as solifluction and frost sorting.

Many sites buried in alluvium or colluvium close to smaller stream channels have been adversely impacted by historical erosion and stream channel incision related to lowering of the

water table and increased runoff during historic times due to overgrazing. Many sites have been impacted by agricultural practices, and sites located in the large areas of stabilized sand dunes in eastern Colorado are prone to eolian blow outs related to loss of ground cover due to both overgrazing and cultivation.

One of the major impacts to the larger, more visible sites is human impact through collection or development. Rockshelters are high-profile locations that attract people for a variety of reasons, and are obvious as potential sources of prehistoric artifacts to even inexperienced collectors. This is especially true along the foot of the Front Range where increasing population and development are bringing more people into contact with these resources every year. The vast majority of the eastern part of the state is in private ownership, and collection by landowners over the past 100 years has had, and will continue to have a profound impact to the most visible sites in this region.

Late Prehistoric Stage-Mountains

The following are research problems proposed by Guthrie et al. (1984:45) with regards to the Late Prehistoric ("Formative") stage.

- Whether or not Formative groups actually utilized the Mountains area or whether the artifacts determined to represent Formative groups are a result of trade or other factors (e.g. projectile point typology problems).

Benedict (1990, 1992) has addressed the use of the mountains by people with aspects of material culture that appear similar to those used by plains groups, although Benedict believes and supports his contention with good evidence that these groups (Hogback complex) represent mountain- and hogbacks/foothills oriented people, and not "Formative" people that are using the area seasonally. This question is addressed in greater detail above in Research Concerns.

- Whether the Indians who occupied the Mountains area represent diffusion from outside regions or whether there were indigenous "mountain-oriented" cultures, or both.

Please see the answer to the previous question.

- If there were occupation of the Mountains area by Formative Stage groups, what were the causal variables related to the continuation of an Archaic lifestyle?

As discussed above in several sections, an Archaic economy and lifeway dominates the Late Prehistoric stage in all of the subareas of the Platte River Basin, and in fact an argument can be made that a hunting-gathering "Archaic" lifeway dominated in the Platte River Basin from the Paleoindian stage through the Protohistoric. Evidence indicates that late Early Ceramic people were experimenting with corn horticulture at the foot of the Front Range south of Denver, and possibly out onto the plains, but it is yet to be demonstrated that horticulture provided more than a small and intermittent addition to the subsistence of these people. As far as the causal variables related to the continuation of an Archaic lifestyle in the mountains aside from the reasons given above, the shorter length of growing season in the mountains would not allow for the production of

domesticates by ostensibly "Formative" groups; a generalized hunting-gathering economy is the only choice by anyone utilizing the mountains during part of their seasonal round.

Additional Research Problems

Tate points out in Chapter 5 that the research questions posed by Eighmy (1984) and Guthrie et al. (1984) for the Archaic Stage continue to be relevant. This statement also applies to the Late Prehistoric stage. Much progress has been made in answering these questions, but as with the Archaic stage, these questions are being addressed with limited information, and in what has become one of the classic truisms often stated at the end of reports and monographs, more data are needed to continue to address the questions presented, and as more data are gathered, more questions are generated. Unfortunately, most of eastern Colorado is in private ownership, and the information required to address many of these questions regarding the archaeology of this area may be a long time coming if researchers rely only on the occasional and fortuitous cultural resource management project. Funding for projects necessary to collect this information will probably come from alternative sources.

Many of the more general research questions found at the end of Chapter 5 (Archaic stage) are relevant to the Late Prehistoric stage as well, and some are restated below to fit the Late Prehistoric stage. All of the data needs stated in that chapter are also valid to the Late Prehistoric, and are restated below for added emphasis. The following list is meant to serve as a guide to some of the many Late Prehistoric research topics, and should be considered as a point of departure for further research, and not as a comprehensive list.

- Continuing investigation into the Hogback complex as a cultural entity and the geographic boundaries of the complex. What is the cultural relationship between mountain and hogbacks/foothills-oriented Hogback complex people and contemporaneous groups immediately to the east that possessed similar technologies?

- Examination of the cultural historical validity and therefore the diagnostic value of the different projectile point styles or types that have been proposed for the Early and Middle Ceramic periods should continue to be examined critically. Among many other potential questions are the following:

    1. Are Bayou Gulch Corner-notched projectile points distinct from Magic Mountain/Hogback Corner-notched points? If so, what is the cultural/temporal relevance of this difference?

    2. What is the cultural relevance of the increase in the relative frequency of serration in Early Ceramic projectile point assemblages from the plains to the hogback/foothills, if any?

    3. Are Desert Side-notched points or their eastern slope equivalents indicative of the presence of Numic groups east of the Continental Divide? If so, what is the temporal/spatial range of these archaeological groups in eastern Colorado?

- Based on the presence of lithic material from the Trout Creek quarry at several sites at the Ken-Caryl Ranch, Johnson et al. (1997) proposed an up/down "piston engine" (Benedict 1992) system of seasonal transhumance in use by groups living in and at the base of the southern Front Range, using the valley of the South Platte River as the travel corridor. This hypothesis merits testing, and additional information should be examined. Do South Park and the upper Arkansas River Basin, with lithic sources such as the Trout Creek quarry, serve as analogs to North and Middle parks and the Kremmling chert and Table Mountain jasper source areas, or was a system without a northern Front Range analog in use? Is the lack of evidence for high-altitude communal game drive systems in areas other than the Indian Peaks/Rocky Mountain National Park area a result of an actual absence of these systems as Benedict (1992:4) suggests, or is this perceived absence a result of sampling error?

- Investigation of the cultural relationship and interaction between the Upper Republican people of the High Plains and the more generalized Middle Ceramic groups of the Colorado Piedmont. Are these distinct cultural groups?

- Analysis of assemblages, features and architecture can yield information relevant to where components fall in the forager-collector continuum (Binford 1980). Brunswig (1996) proposes a model of prehistoric hunter-gatherer subsistence strategies in which Early Ceramic groups in the Platte River Basin participated in a subsistence-settlement pattern closer to the collector end of the continuum, and that systems closer to the forager end of the continuum are more prevalent during the Late Archaic and Middle Ceramic periods; the differences in systems being influenced by changes in resource density and availability due to change in the environment. This model merits further testing as a useful tool in determining change in the adaptive strategies of people through time.

- Continued investigation of the presence and importance of corn horticulture, and attention to the question of why sites with evidence of corn seem to be clustered in the hogbacks and northern Palmer Divide. Is this a prehistoric cultural phenomenon, or a result of bias due to differential preservation in sheltered sites?

- Additional investigation into the validity of the so-called Franktown focus (Withers 1953). Additional information from excavation may be difficult to attain because of the high percentage of the northern Palmer Divide in private ownership, and also because of site destruction through collection. Analysis of previously unanalyzed collections from sites excavated by Withers that are stored at the University of Denver could provide some additional insight into this question.

- Continued research on Early Ceramic mortuary ritual. Can differences in material culture accompaniments and treatment of the body prior to final interment be resolved into identifiable separate patterns, and if so, do these different patterns represent temporal differences and/or the presence of several different cultural or ethnic groups within eastern Colorado during the Early Ceramic period?

The following questions are taken from the additional research questions presented at the end of Chapter 5, with some slight modifications.

- What is the seasonality of site occupations and kill/butchering events?
- What is the nature and prevalence of residential architecture and storage features?
- What are the sources of tool stone and other materials found at sites? What is the evidence for long distance travel or exchange from adjoining regions?

Data Needs

As Tate states at the end of Chapter 5, the data needs are numerous. The following list is adapted from the previous chapter, and includes some of the most important sources of data.

- More survey, particularly block survey, especially on the plains and in the mountain parks.
- Excavation of more single component sites.
- Excavation of more multicomponent sites with stratigraphic separation between components.
- Sites with the potential to yield absolute dates for Late Prehistoric components, particularly Middle Ceramic period sites.
- Late Prehistoric sites with residential architecture.
- Stone circle sites with associated absolute dates.
- Standardized artifact descriptions and metric data, and high-quality illustrations of important artifacts. Many site reports, especially the older reports, document important artifacts with drawings that are generalized representations of artifacts or with poor quality photographs. Sometimes artifacts are not depicted at all. These techniques sometimes make the comparison of artifacts from different sites difficult if not impossible, as was discovered during the writing of this context. Expense and time are important considerations, but in the long run there is no substitute for high-quality, scaled drawings of all diagnostic artifacts.
- Comprehensive analysis and descriptions of faunal and floral collections from sites.
- Continued emphasis on geomorphological studies at sites.

Sites with Further Data Potential

The following list of sites (in no way intended to be all-inclusive) represents those with the potential to provide additional information that would aid in the interpretation of the sites

themselves, and add significantly to our understanding of how these sites fit into the current models of the post-Archaic prehistory in the Platte River Basin in particular, and in the Central Plains in general. Included with the sites are suggestions of what analyses would provide the greatest impact per unit of effort. Some sites may require additional data recovery. Many of these sites have been cited over and over again in the cultural overviews of cultural resource management reports, and this information is used uncritically to support outdated theories, even if these sites lack absolute chronological controls (e.g., Buick Camp, Smiley Shelter). Other sites have never been adequately reported, or reported at all (e.g., Jarre Creek, Rainbow Creek), or the huge amount of material culture recovered from excavations has inhibited adequate detailed analysis of many aspects of the collection (e.g., Bayou Gulch, Franktown Cave), not to mention methodological problems during the initial data recovery. There are also a few rare and important sites for which the data are so cryptic that archaeologists have only equivocal interpretation of what they represent, or how they fit into the established cultural historical framework developed for eastern Colorado (e.g., Cedar Point Village [see Chapter 7]). Many sites not on this list would benefit from a reexamination of the collections or perhaps additional excavations with a specific goal in mind, such as the collection of charcoal samples for radiocarbon ages.

- Franktown Cave (site report, and direct date on corn, corncobs and/or stalks); collection curated at DU Museum.
- Agate Bluff (artifact photodocumentation and radiocarbon age, charcoal may still be curated); collection possibly curated at DMNH.
- Helmer Ranch (site report); collection curated at DU Museum.
- Jarre Creek (site report and better date, charcoal is in collection); collection curated at DU Museum.
- Rainbow Creek (site report); collection curated at DU Museum.
- Bayou Gulch (continued analysis of large collection); collection curated at CU Museum.
- Cliff Swallow Cave (artifact photographs and radiocarbon age); location of the collection is unknown and presumed to be in private hands.
- Cherokee Mountain Rockshelter (radiocarbon age, or possibly thermoluminescence analysis on sherds); location of the collection is unknown and presumed to be in private hands.
- Buick Camp (radiocarbon age, and site report of DU collection); collections curated at CU Museum and DU Museum.
- Smiley Shelter (radiocarbon age); collection curated at CU Museum.
- Cedar Point Village (see Chapter 7) (radiocarbon age, or thermoluminescence analysis of sherds); collection curated at CU Museum.

- Friehauf site, 5MR472 (descriptive site report, possible radiocarbon ages from features, photo documentation of artifacts); collection curated at CU Museum.

- Crescent Site (site report that integrates all phases of work and includes greater synthesis and interpretation of data and photo documentation of artifacts); location of collections unknown.

- Roberts Buffalo Jump (possibility of thermoluminescence date on sherds), location of collection unknown, presumed to be in private hands.

Chapter 7

THE PROTOHISTORIC PERIOD

Bonnie Clark

INTRODUCTION

The Middle Ceramic period is followed by what is sometimes been referred to as the Late Ceramic period, which here is called the Protohistoric period (AD 1540-1860). This follows the conventions of most research in the area. However, we are in agreement with those who use the term Late Ceramic rather than Protohistoric (Nelson et al. 1997; Stone 1997) because of concerns that the period not be defined by what is about to occur. Until permanent settlement by Euroamericans, the material culture evident in the region was affected by but not superceded by European expansion. Rather, a continuation of indigenous cultures is seen with both a long continuity with the past and often ingenious use of new resources.

The Protohistoric period begins with European contact and ends with the period of permanent settlement by literate peoples, or the beginning of the Historic period. The initial contact does not actually need to be in person, but can manifest itself as goods that are traded beyond their original possessors. Although Coronado never traveled through the Platte River Basin, his entry into the region in 1540 provided both goods to the aboriginal inhabitants, and the written record of them. For the next three hundred years, travelers and traders were in contact with the Native Americans of the region, occasionally documenting their journeys. For example, this area was crisscrossed by New Mexican groups known as Ciboleros and Comancheros, who traveled to the Plains to hunt bison and trade with Plains groups (Kenner 1969). In 1822, Mexico declared independence from Spain and opened her borders for trade. Trapping in the area began in earnest once the Taos market (in present-day New Mexico) was easily available. Although this date could be chosen as the end date for the Protohistoric period in this region, the written record is still spotty. In addition, the region's aboriginal inhabitants are firmly in control. The first significant, sustained written record accompanies permanent settlement by literate peoples. In the Platte River Basin, this follows the discovery of gold at the confluence of the Platte and Cherry Creek in 1858. Thus, the Protohistoric period spans the years 1540 to 1860.

It was not just cultural changes that affected the Protohistoric population. This period began with an environmental change. As outlined by Gunnerson (1987:97), in about 1500, the climate on the High Plains returned to a more normal climatic regime. For several hundred years, the Plains experienced severe droughts, a condition that some have theorized led to a depopulation of the area (Gunnerson 1987). As the climate reached a condition much like the current one, use of the Plains escalated.

In the Platte River Basin, the Protohistoric period was a period of cultural dynamism. A combination of archaeological, ethnohistoric, and linguistic data provides an outline of the cultural history at this time. The general outline is fairly well known. For the most part, Utes controlled

the western half of what would later become Colorado to the eastern foothills of the Rocky Mountains. The Utes were not the only group utilizing the mountains of the Platte Basin, especially the mountain parks of North Park, Estes Park, and South Park. As both travel corridors and ideal big game refuges, the mountain parks drew in Shoshonis and Comanches, as well as predominantly plains-oriented groups.

The High Plains were home to an ever-shifting population during the Protohistoric period. Dating to the beginning of the Protohistoric period is a complex known as the Dismal River (Brunswig 1995). Dismal River sites are now widely accepted as a manifestation of Apache culture. The Apache engaged in a varied economic strategy and ranged from sedentary horticulturalists to mobile hunter-gatherers. The Apache were in the Platte Basin only until the 1700s. Comanches, occupying an area just north of the Utes' territory, were supplied with horses by Utes. Together with the Ute, the Comanche drove out the Apache. By 1750, the Apache people had moved south of the Colorado border (Cassells 1983).

Almost as quickly as the Comanche tribe had moved from the mountains to the Plains, they were joined by other groups. Galvanized by the introduction of guns and especially horses, the Plains groups experienced a rapid cultural and territorial change. The two most represented groups were the Arapaho and Cheyenne. A mixed camp of Arapahos, Comanches, Kiowas, Kiowa-Apaches, and Cheyennes was reported by Major Long during his 1819-1820 expedition to the Rocky Mountains (Fuller and Hafen 1973). About this time, most of the Comanches moved farther south into New Mexico and Texas. The Treaty of Fort Laramie, signed in 1851, recognized the aboriginal possession of the area between the North Platte and the Arkansas rivers by the Cheyenne and Arapaho tribes.

Protohistoric sites provide archaeologists with unique opportunities to tie prehistoric sites to ethnohistory, ethnography, and oral history. Located in the netherworld between prehistoric and historic sites, they are a ladder between the two. For example, the association of Apaches with the Dismal River Aspect is based primarily upon such research. A 1727 map produced during Ulibarri's Spanish expedition to El Quartelejo identified the location of an Apache camp. That same camp was then excavated and identified as a Dismal River site (Cassells 1983). Similar conjunctions are perhaps possible for Arapaho, Comanche, Cheyenne, Kiowa, and other groups.

Using a combination of the OAHP database and site records, we have identified over 130 sites with a component that dates to the Protohistoric period (Figure 7-1). Primarily, Protohistoric sites are open camps or open lithic scatters. Other sites include open architectural (usually including stone circles), sheltered camps, sheltered lithic scatters, rock art, battlefields, trails, and peeled trees. Cultural and temporal designations are based primarily upon diagnostic artifacts, specific types of features (e.g., peeled trees, wickiups, tipi rings), and ethnographic analogy or ethnohistory. Identified cultures are primarily Dismal River (Apache) and Ute, but others include Shoshone, Ute-Numic speakers, Kiowa-Apache, and Cheyenne/Arapaho. The final two are represented, however, by only a few sites.

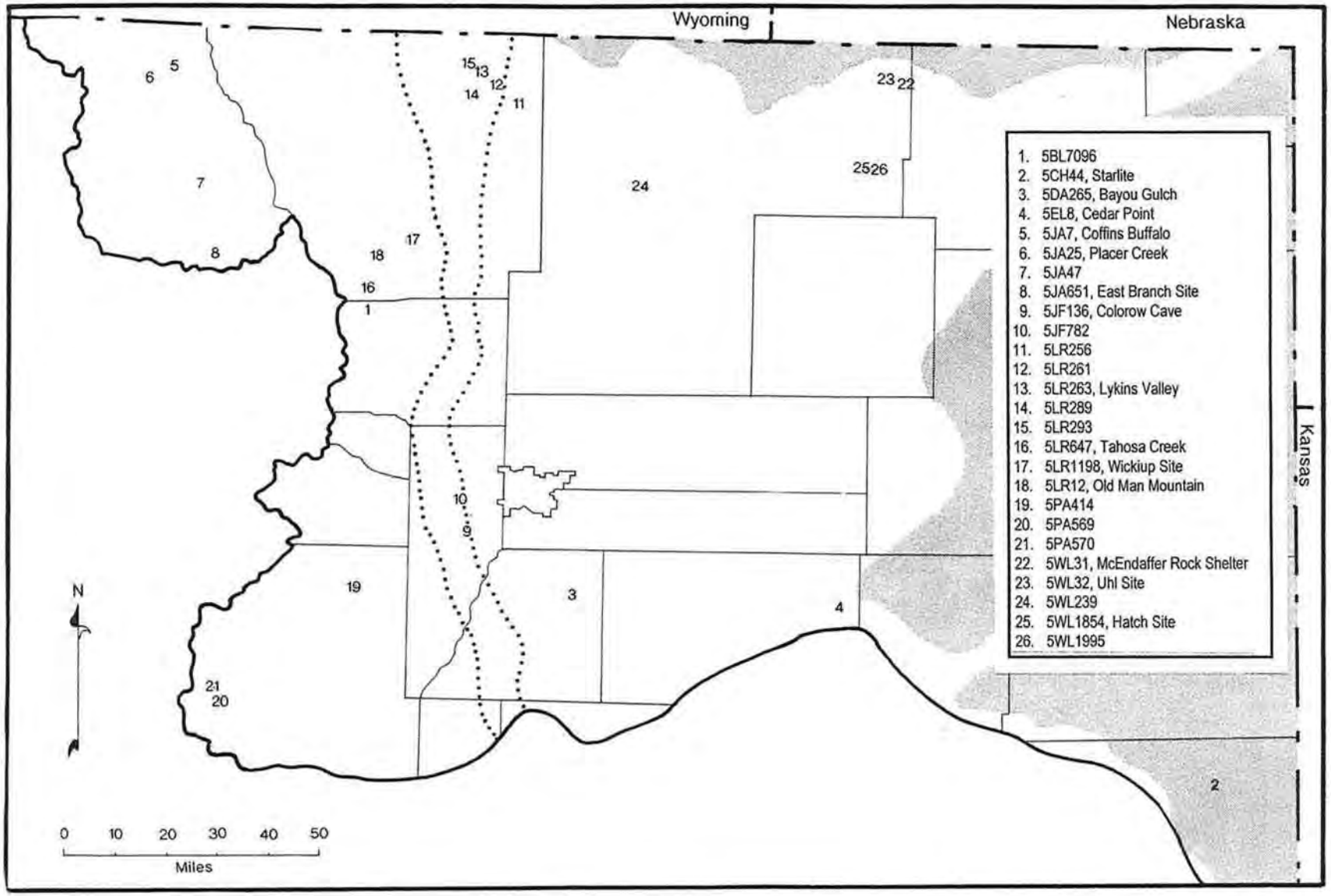

Figure 7-1. Protohistoric Sites in the Platte Basin.

PLAINS

Culture History

The combination of archaeological, ethnographic, and ethnohistoric research possible for Protohistoric sites is exemplified by the work performed on the Dismal River complex, a Plains Apachean culture. Apaches were an Athapaskan-speaking group who migrated south from their homeland in the vicinity of the present-day Northwest Territories in Canada. Brunswig (1995) compiled the data in the region to claim that the Dismal River people were present in Colorado from AD 1525 to 1725, with a ceramic-using phase from about AD 1625 to 1725. He does allow for an earlier entry into Colorado, based upon the hypotheses that the Apachean groups were responsible for the production of Avonlea points and the Carrizo Ranch stone rings. An Apachean affiliation has also been suggested for the few three-rooted molar specimens identified in Upper Purgatoire burials (Brunswig 1995:175). These data, which Brunswig (1995:175) call, "very limited and largely circumstantial" dated from about AD 1300 to 1550.

It appears from the archaeological and ethnohistoric record that the Dismal River Plains Apache ranged from sedentary to mobile, depending on circumstance and location. Because early work on the Dismal River Aspect focused on the settled villages in southwest Nebraska (Gunnerson 1960), the evidence of the Dismal River Aspect in the Platte River Basin has seemed incomplete by comparison. However, more recent research on the Plains of Colorado, particularly that performed by Brunswig (1995), leads one to believe that Dismal River groups practiced an array of subsistence and occupational strategies. Most of the Platte River Basin is part of what Brunswig identifies as western Dismal River. Here, groups on the northern and central High Plains were nomadic hunter-gatherer bands with little evidence of either sedentism or agriculture. The southern populations practiced a mixed strategy of horticulture and hunting and gathering with evidence of some sedentary traits. If Cedar Point Village, 5EL8, located on the far southern edge of the Platte Basin is in fact Dismal River, it bears more resemblance to the southern manifestation of Dismal River than the western one.

Dismal River sites in the Platte River Basin are identified first and foremost by the presence of diagnostic ceramics. Overwhelmingly, these sites contain Lovitt Plain ceramics with occasional Lovitt Simple-stamped, both of which fall under the category of Dismal River Gray Ware. These types of vessels were formed by lump modeling or coiling, followed by the used of a grooved or thong-wrapped paddle and anvil. This is followed by surface scraping and smoothing, which tends to obliterate paddle marks. The vessel form is usually a jar with a partially rounded base and straight to flaring neck. If the vessel is decorated, it is stamped just below the rim on the vessel neck and just below the neck on the vessel body. Temper is often a fine sand or grit, although some sherds include some mica particles in the paste. However, if the mica is overwhelming used as temper, the sherd might be considered Ocate Micaceous, which in the Platte River Basin would possibly be a trade ware in the Protohistoric period. Locally produced micaceous wares have been identified in the Platte River Basin that date to earlier in the prehistoric (Gleichman, Gleichman and Karhu 1995); and there is a possibility that locally produced micaceous wares found in the Platte region may be dated to the Protohistoric by future archaeologists. However, the fact remains that trade wares were most likely brought into the area by Dismal River groups, since being more far-ranging than their Ute neighbors, they were interacting with northern New Mexico Pueblos by the 1600s. Occasionally Puebloan sherds are

recovered from western Dismal River sites. Brunswig (1995) identifies the Puebloan sherds at Old Man Mountain as probably having been transported there by Dismal River people.

The more sedentary Dismal River villages are marked by shallow, four- or five-post pithouses. These are often complemented with bell-shaped roasting pits. Besides ceramics, other material culture considered diagnostic of Dismal River include bison scapula hoes and snub-nosed end scrapers, which are essentially unworked except on the scraping edge itself. Gunnerson (1968) identifies end scrapers with carefully chipped graver points as diagnostic. Small, finely flaked side-notched and unnotched triangular projectile points have also been interpreted as diagnostics; however, as Brunswig (1995:178) writes, they "are essentially similar to those of earlier Plains Village and other contemporary regional cultures and appear to lack a distinctive, diagnostic potential for identifying Dismal River sites."

It is generally agreed that except for occasional hunting expeditions on the High Plains by Utes, Apaches dominated the plains of Colorado from the 1500s until early 1700s. There is no good archaeological evidence to the contrary. It should be noted, however, that in a reanalysis of the E.B. Renaud collections, Barbara Downing (1981: Figure b4) identified a number of Great Bend Aspect sherds, one each from 5WL329 and 5YM9. Taken in combination with the Great Bend sherd found at Lehman Cave, 5EL12, the evidence seems to indicate a closer relationship of the Apache to the Wichita culture than previously acknowledged. This would most likely have taken the form of trade relations, and may have been solidified by occasional forays of Wichitas into Colorado.

Starting in the early 1700s, the Apache were beginning to feel pressure from the newly mounted Comanches. Aided by Utes, Comanches pushed the Apaches south into New Mexico in or around 1730 (Gunnerson 1960). During the early 1700s, a group of Apaches was separated from their main group and sought refuge with the Kiowas. Identified from that time on as Kiowa-Apaches, they maintained their linguistic identity, but lived as Kiowas.

Beginning with the Comanches and the mid-1700s, the archaeology of the Platte River Basin is essentially a clean slate. It is known from ethnohistoric records and oral history that the Platte River Basin was occupied first by Comanches, then by Arapahos and quickly followed by the Cheyennes. Other groups were known to join with these purveyors of the so-called horse-gun-buffalo culture. It was a Great Plains phenomenon that fluoresced quickly and was essentially exterminated by the late 1800s.

One example of the Plains tribes is the Cheyenne, a once semi-sedentary group living in the 1600s in the vicinity of Lake Superior. Sometime in the middle to late 1700s, the horse was introduced to Cheyenne territory, and, like that of many of their neighbors, the Cheyennes' way of life was revolutionized. Hunting bison was much easier and safer on horseback, and Cheyennes began to focus a greater share of their time and energy on hunting. As they followed the herds onto the plains, the Cheyennes' territory changed. Although they formerly lived near the Black Hills, by the early 1800s, Cheyennes had begun to winter in the plains along two different rivers, the South Platte and the Arkansas (Hoig 1989).

Bison provided the backbone of Cheyenne subsistence. The meat was eaten fresh or dried for later use, often in pemmican. The bones were used for tools, the internal organs for carrying

bags. In fact, the Cheyenne word for water container is related to their word for heart, which was the organ used for that purpose (Grinnell 1962). Buffalo robes were used both as blankets and to cushion furniture. Finally, processed buffalo hides were used to make clothing, footwear, bags and--most important--tipis. This portable dwelling made of tanned buffalo hide drawn over poles, was universal to the Plains cultures. As Grinnell (1962) points out, during the summer little protection from the elements was needed. During the rest of the year, the tipi, with its fire burning in the center, served as a warm shelter from the wind and snow.

During the Protohistoric period, Cheyennes were organized into bands or camps. Each camp was made up of one or more kindreds. A Cheyenne kindred consisted of the family head, his daughters and their husbands, and other relatives (Hoebel 1960). Within the family itself there were differentiations. Like most traditional societies, Cheyennes divided labor based on gender. Men were the hunters, women the gatherers. In addition, men took care of the horses, conducted raids, and defended the village. Women were also tailors, architects, and cooks.

When the Cheyennes were still sedentary, they made pottery. Other cooking and eating dishes included bowls made from turtle shells or the knots of boxelder trees and spoons made from the horns of mountain sheep or buffalo (Grinnell 1962). As the tribe became more nomadic and trade increased on the Missouri, pottery production slowed to a halt (Berthrong 1963). Metal kettles and tin cups were popular trade items. They were lighter than traditional items and much less prone to break than pottery. Metal arrow points and knives were also popular trade items. They did not, however, completely supplant stone tool technology. Excavations at Cheyenne and Pawnee sites in other states indicate that stone tools continued to be used until the 1900s, although they may have been taking on more of a magico-religious meaning and less of a functional use as time passed (Hudson 1993; Wood 1971a).

Arapahos had a very similar suite of material culture. Like Cheyennes, they utilized the buffalo as their subsistence base, and their lodges faced with the openings to the east (Toll 1962). A general concern for orientation to the four directions is an important aspect to most Plains tribes and should be expected at such sites.

The lack of sites that date to this temporal period or are capable of being identified as specific to a certain group is pervasive in this region. In his comments on a research design for eastern Colorado, Butler (1980:4) asks, "What happens in Colorado from about AD 1300 to AD 1800? Where in the archaeological record are the Cheyenne, Arapaho, Ute and Comanche?" The lack of sites is even more frustrating given the wealth of written data; there is no question that the Colorado plains were in use. Two related problems are outlined here. First, why are there so few documented Protohistoric sites on the plains that date to the 1700-1800s? Part of this problem is that stone circle sites are so visible, and thus prone to collection. It is exactly those elements that would give us a clearer view--iron projectiles and other trade goods--that are the first things to be collected. Without those items stone circle sites are, at least on the surface, undatable. Second, actual tribal affiliation of sites is extremely difficult because of several factors. The material culture of different groups was so similar. Additionally, there was so much group mobility that it cannot be said with confidence that a site dating to a particular time, for example 1810, would point to Arapaho affiliation, and not Cheyenne, or Sioux, or Kiowa. To date, the only way to identify cultural affiliation of such sites is through ethnohistorical, documentary evidence.

Database

Platte River Basin Plains cultures' site types dating to the Protohistoric include open camps, open lithic scatters, open architectural sites, sheltered camps, sheltered lithic scatters, rock art, trails, scarred trees, and battlefields. Most of the sites were given their temporal affiliation based upon the presence of Dismal River sherds or trade goods. A handful have been dated using radiocarbon samples (Appendix, Table 4). Weld County, an area that has been surveyed more extensively than many of the other Platte Basin counties, has a good sample of the types of Protohistoric sites found on the plains. There are 16 sites, 15 of which have identified site types. The slim majority, six, are open camps, followed by five open architectural sites. The difference between these two site types often lies in the era they were recorded, as the majority have stone rings (similar to mountain sites). Four sites are recorded as sheltered camps with a single metal projectile point assigned a Cheyenne or Arapaho affiliation.

Open Camps

There are a number of open camps on the High Plains. A few of them, including the Starlite Ridge site (5CH44), have been tested or excavated. The majority have not. A good example of an untested Protohistoric open camp is 5WL239, a scatter of chipped and ground stone located atop a ridge. The site was assigned a Protohistoric temporal affiliation based on the presence of a metal projectile point and a rimfire bullet cartridge. Stanley Davis (1973) includes this site in his thesis on the archaeology of the Groves Ranch area and indicates that the camp is probably Arapaho, given the presence of the cartridge which dates the site to the 1800s. The functional assessment of this site as a camp is probably based on the high number (12) of ground-stone fragments and scraping tools (39). The lack of any architectural evidence could be used to interpret this site as one where occupants utilized tipi pegs to hold down the structures, another indication of a site utilized toward the end of the Protohistoric period.

The Starlite Ridge Site (5CH44) was located by CDOT personnel during survey for a gravel pit 6 km (4 miles) north of Cheyenne Wells (Grant 1980). The site is ideally located, on a low ridge overlooking the North Fork of the Smokey Hill River. The site consisted of a moderate lithic scatter with partially exposed concentrations of cobbles and charcoal eroding from the ridge top. Some charcoal was collected from these probable hearths, but not enough to radiocarbon date. Recovered cultural material included the basal fragment of a large corner-notched, stemmed projectile point collected from the surface of a deflated area of the site, and the base of a small, side-notched projectile point recovered during excavation. Eleven scraper fragments were recovered, the majority of which were small discoidal or end scrapers. Other lithic tools included a complete ovoid basalt biface, five incomplete bifaces, and three choppers. Almost 300 pieces of debitage, as well as several cores, indicate that a significant amount of core reduction took place at the site. There was a heavy reliance on small, locally available stream cobbles for raw materials, with a preference for quartzite.

No absolute dates are available for the site, but four sherds were recovered that were at least tentatively identified as Dismal River. The preponderance of discoidal scrapers, as well as the small corner-notched projectile point, would appear to bolster the affiliation of the site as Dismal River. Grant (1980) noted a conspicuous absence of ground-stone artifacts along with a preponderance of hide-working and butchering tools. The researchers interpreted the site as a

short-term camp for the processing of game and primary decortication of locally available tool stone.

Open Architectural Sites

The most famous, or one might say infamous, open architectural site in the Platte River Basin plains region that dates to the Protohistoric period is Cedar Point Village, 5EL8. With its substantial architecture, it is an anomaly, however. The majority of these sites are stone circle sites, such as the Hatch site, 5WL38, or the Camp site, 5WL1995.

Cedar Point Village (5EL8) is one of three ceramic sites located on Cedar Point, a wooded escarpment overlooking the South Platte River Basin. The sites, including Smiley Rockshelter and Buick Camp, were excavated by Herbert W. Dick in 1952 (Wood 1971b). In 1955, Joe Ben Wheat returned to Cedar Point Village for additional testing. The results of these excavations were reported by Raymond Wood (1971b) in *Southwestern Lore*. Cedar Point Village had seven, mostly shallow, circular to rectangular pithouse depressions, five of which were excavated. One of the structures, House 4, contained three postholes, but Houses 5 and 3a contained only a single post, making them different from the classic, five-post Dismal River pithouse at sites like White Cat Village (Champe 1949). Another difference from White Cat is found in House 3 which was more than one meter in depth, whereas White Cat pithouses were only slightly below ground surface. The other house depressions at Cedar Point ranged from 30 to 60 cm in depth. Chipped stone included several triangular, unnotched points, and a single, side-notched point. Five end scrapers were also recovered, in addition to several bifaces and a number of retouched or utilized flakes. Other artifacts included ground stone and bone awls. The ceramics from the site are plainware with heavy sand temper and some indications of stamping on the exterior. One body sherd has the broken stub of an appendage.

In part because of the difference between the Cedar Point ceramics and the Upper Republican wares at Smiley and Buick, Dick suggested a Dismal River affiliation for the site. Wood, however, points out the difference between the Cedar Point pithouses and other known Dismal River pithouses, as well as the presence of a sherd with an appendage, a type of decoration unknown for Dismal River vessels. Wood (1971b:81) writes, "This identification [Dismal River] is perhaps the most plausible one, choosing from among the cultures in eastern Colorado now known to us, but it is not a particularly defensible one." As W.R. Wood (1971b) and others, including Cassells (1997) have suggested, this is one of those sites begging further investigation and dating using absolute techniques.

The argument of whether Cedar Point Village is Dismal River points out that although it is the best-documented Protohistoric complex on the High Plains, we still have much to learn about Dismal River. Brunswig (1995) echoes Gunnerson (1960) in pointing out that Apaches were culturally plastic people, borrowing traits from their neighbors. Whether the Apachean occupation overlapped in time with Middle Ceramic people is still under debate. Certainly Upper Republican ceramics with appendages are not uncommon. Perhaps Cedar Point is the manifestation of an extremely fluid Dismal River settlement. It still seems, to use Wood's term, the most plausible explanation of the site.

The Hatch site (5WL38) was one of the suite of sites investigated in northeastern Colorado by John J. Wood (1967). A multicomponent site, Hatch is located on a gentle slope, with an eroded area that has cut an irregular face across the site. It is in the cut that the buried occupation is evident. The number of stone circles on the site surface is difficult to ascertain, but Wood estimates there are at least 12. Some of the circles are directly on the surface and some are partially buried. This, in combination with the superposition of some of the circles, indicates repeated use of this site. Excavation was pursued in two relatively well defined stone circles, designated Features 1 and 2. Both features are approximately 4 to 5 m in diameter and contain interior hearths that are at least partially lined with rocks. The artifacts associated with these features and the stratum on which they were resting (II) are entirely of chipped stone, comprised mostly of lithic debitage with a few finished tools including two blades and two end scrapers. A single milling stone was discovered within the hearth in Feature 1.

Both Wood (1967) and Brunswig (1993) interpret the stone circles as tipi rings, and certainly their size and morphology fits that designation. Faunal materials recovered included general artiodactyls, as well as identified bison bone elements. Brunswig suggests that the site may be a later summer or fall hunting camp designed to take advantage of bison rutting and herd aggregation. A fall camp would probably necessitate the use of a central hearth for heating the tipis, and these are present at Hatch. Charcoal from the hearth in feature 1 was radiocarbon dated to 160±100 BP. Brunswig (1993) calibrated the date to 1530-1950 with a median date of AD 1743. Given that date, the site could have a range of affiliations, from Comanche to Arapaho, Cheyenne, Pawnee, or even Sioux.

The Hatch site is located in the portion of the Pawnee National Grassland called West Stoneham Pasture. The region has been the scene of intensive survey and site recording as part of the UNC South Platte Archaeological Project. A number of the tested sites were open architectural, stone ring sites. The Camp site (5WL1995) yielded triangular, unnotched points, scrapers, flake knives, drills, choppers, ground stone, and pottery. It has been assigned a Dismal River affiliation (Brunswig 1994). The site contains two stone rings, one 6.2 m^2 and one 3.4 m^2. When compared to the nearby Hatch site, the size of the rings seems peculiar. Given the Dismal River association of the site, it is tempting to interpret the smaller of the rings as representative of a stone ring utilized for a tipi carried by dog travois, with the larger perhaps representing reuse of the site at a later, horse-drawn time. This is, of course, merely speculative, but such analyses should be possible once archaeologists begin to look more closely at the morphology and artifactual remains of stone circle sites.

Sheltered camps

Although one often tends to think of the High Plains as unbroken, flat land, they contain rock outcroppings and ridges that provide shelter. These places were undoubtedly desirable respite from the wind and weather of the prairie. Unfortunately, these same features are especially visible and have drawn collectors to these sites.

Lehman Cave (5EL12) is located near the eastern tip of the Black Forest escarpment. The cave is located at 2195 m, providing temperatures 10-15 degrees cooler than the surrounding plains. The elevation also provides for greater precipitation. Lehman Cave is about 2.1 m high at its opening and about 1.8 m wide. The interior tapers to a crawl space from which no artifacts

were recovered. In the front of the cave and extending outside is a considerable midden deposit. The site was excavated first by local avocationalists including Gene Nelson, Bruce Stewart, and Jesse Graeber. In 1973 the Denver Chapter of CAS tested a large portion of the midden of the site (Lyons and Johnson 1994). The site has been repeatedly utilized and includes artifacts dated to the Middle and Late Archaic and pottery identified as Plains Woodland, Great Bend, and Dismal River. Unfortunately, it was impossible to distinguish any stratigraphy in the midden area. The presence, however, of both Dismal River and Great Bend pottery may indicate a trade relationship between Plains Apaches and Wichitas, who produced Great Bend pottery.

McEndaffer Rockshelter (5WL31) was first identified and excavated by John Wood (1967). It is a large, south-facing overhang at the crest of a long narrow escarpment. The shelter has a maximum length of 100 m and width ranging from 4 to 10 meters. There appears to have been multiple occupations of this rockshelter. Artifacts recovered include 23 projectile points, both cord-impressed and plainware ceramics, and numerous faunal remains. Only a small portion of the faunal material was identifiable, but of that identified, the most numerous was black-tailed prairie dog. Cottontail remains were next in frequency, followed by bison and pronghorn. Interestingly, a number of the pronghorn remains were from immature animals. In addition, several human bones were recovered during the excavation, but none were complete enough to be considered burials. Based on the ceramics, Wood identifies three different complexes at the site, the latest a Dismal River with Lovitt Plain sherds. Unfortunately, like most sheltered occupations, McEndaffer has been disturbed by collectors. Because the stratigraphy was compromised, it is impossible to determine which other artifacts are associated with the Dismal River sherds.

HOGBACKS/FOOTHILLS

Culture History

The hogbacks/foothills area of the Platte Basin represents a meeting ground, both of different ecotones and different cultures. It was a destination both for groups coming from the mountains and for groups coming from the plains. One should expect that any of the groups previously discussed can be expected in the foothills. The region provided two very important resources, namely, shelters and lithic material. The quarries of the hogbacks, and especially of North Table Mountain, were important sources of tool stone.

Database

Sites recorded with Protohistoric components in the hogbacks include sheltered camps, open camps, and open architectural sites. One might expect that at one point there were many more sites located in this area, but that its proximity to urban areas, specifically Denver, Boulder, and Fort Collins, has led to a degradation of the material record. However, the subarea's proximity to urban zones has accounted for a number of sites that are ethnographically known locales. Two such sites, Colorow Cave and Inspiration Tree Picnic Area, are in the Denver area. Colorow Cave (5JF136), located in the hogback, was a sheltered camp reported to have been utilized by Colorow, a chief of a northern band of Utes. Ethnohistoric accounts indicate that his band spend the summer in the Roaring Fork Valley between Glenwood Springs and Aspen, but

would travel to the Platte River Basin seasonally, at which time they would sometimes stay in this cave. Colorow Cave no longer retains any archaeological integrity. Inspiration Tree (5JF806), as indicated by the site name, is now a picnic area. A sparse scatter of lithic artifacts, some of which are thermally altered, is the only material indication of activity at this site. However, the Inspiration Tree, also known as "Chief Colorow Tree" or "Ute Council Tree" has been identified as a location for Ute council.

Perhaps the best suite of Protohistoric sites recorded in the Platte River Basin was discovered during survey for the Boxelder Project in the foothills between Fort Collins and the Wyoming border (Morris et al. 1979). Four Protohistoric sites were located including three campsites and a rock art site. Lykins Valley (5LR263) is a stratified campsite and one of the few Protohistoric sites in the basin to undergo a full excavation. The other two campsites were largely surface manifestations and were identified as Protohistoric based on trade items such as an iron projectile point at 5LR256 and a seed bead at 5LR261. Site 5LR293 consists of a series of petroglyphs covering 16 m of a south-facing sandstone cliff bordering Boxelder Creek. It includes a variety of zoomorphic, anthromorphic, and abstract geometric figures. The most elaborate panel is a clearly defined horse and rider, with a saddle, reins, and ornamentation (Figure 7-2). No cultural material was identified in the vicinity by the researchers, although local informants indicated that there were once artifacts and tipi rings located between the rock art panel and the creek.

It is easy to imagine that at one point rock art dotted the rock outcrops of the hogback and foothills subregion. Obviously, any representation of the horse must postdate the beginning of the Protohistoric period and is thus easy to relatively date. The vandalism of this fairly isolated panel may help explain why so few Protohistoric rock art sites have been located in the Platte.

The Lykins Valley site (5LR263) is one of the best documented Protohistoric sites in the Platte River Basin. Located on Boxelder Creek, Lykins Valley is a deeply stratified site containing both Protohistoric and Late Archaic components. The site was excavated in 1974 by researchers at CSU (Ohr et al 1979), who hypothesized two Protohistoric occupations. The more recent of the two, present on the surface and in Level 1, contained a number of projectile points, end and side scrapers, evidence of lithic production and sharpening, and grinding slabs. Trade items included a gunflint, hundreds of glass beads, a clay pipe (fragments of which were both on the surface and in Level 1), a metal tinkler, and metal fragments that may be from a brass kettle. A hearth located in this level yielded a date of 250 $\pm$ 85 years B.P., 1453-1955 cal A.D. with a single intercept at 1657. The pipe was analyzed using the Binford (1962) equation, yielding an estimated date of manufacture of 1672. This date should be used with great caution, however. The pipestem chronology requires a large sample size to be accurate, "preferably no fewer than seventy-five or one-hundred" (Noel Hume 1963). The pipestem equation was also established with samples from Virginia. It should be assumed that the mean date for Colorado would be at least 10 years later than that of the East Coast.

A second, lower occupation was identified in Level 2. It consisted mainly of a lithic tool kit with a few grinding slabs and several shaft smoothers. A lump of clay and one of chalk were identified. Only a few trade items were located in this level, including one glass bead and two metal fragments. The researchers suspect that the trade items may have been transported down to

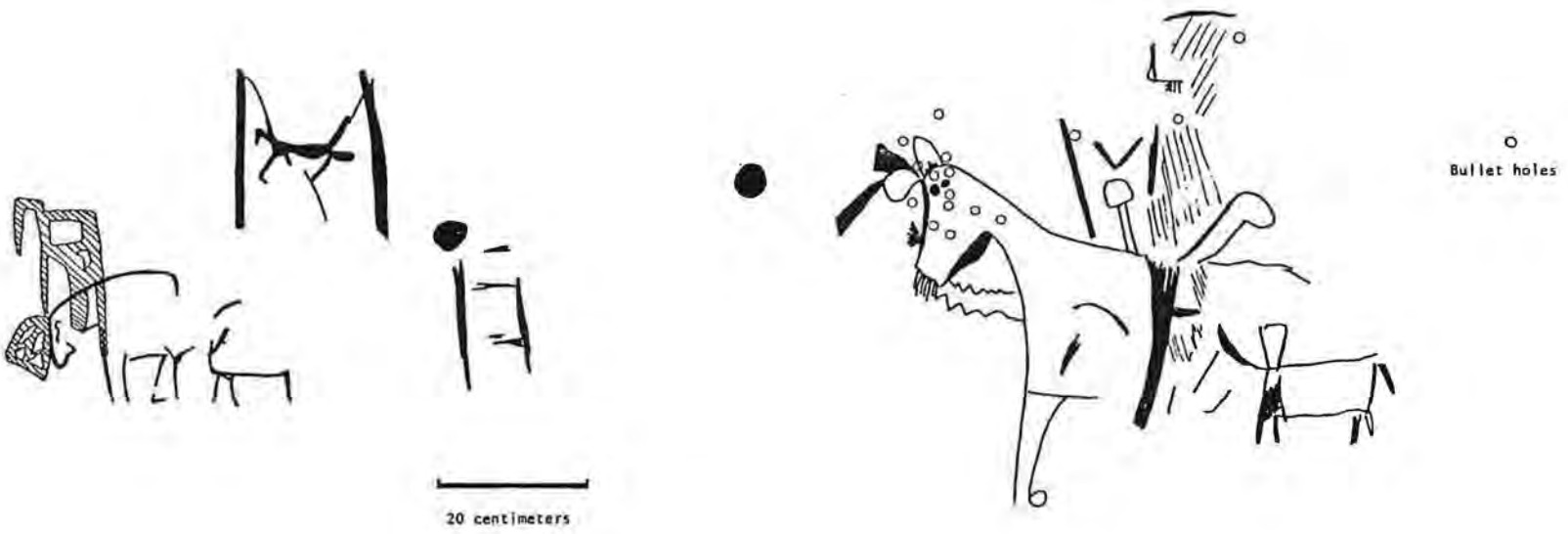

Figure 7-2. Site 5LR293, petroglyph panel, Boxelder Canyon (from Morris et al. 1979).

this level by the considerable rodent action at the site, but the horse scapula discovered in this level is most likely in situ. A hearth located in this level was dated to 210 ± 95 B.P., 1472-1955 cal A.D. This date is in fact slightly later than the one in the first occupation; however, given the difficulty of dating relatively recent carbon samples and the large deviation on both, the apparent inversion of occupation dates is statistically insignificant.

The Surface/Level 1 occupation has been interpreted as a substantial campsite. Bone elements from bison, deer, possibly pronghorn, and horse are present. The discovery of substantial portions of several of the animals suggests a nearby kill with butchering taking place at the site. A recovered polished tibia fragment may be evidence of hide preparation activities. The Level 2 occupation is similar in function. It does, however, includes evidence of possible ceramic production (a baked ceramic clump) and tool production. The level includes two in situ flaking localities. One excavation unit contained several large quartzite flakes, with the final reduction and shaping taking place in a nearby unit. More than 100 flakes of the same material were recovered from the hearth, perhaps indicating attempts at thermal alteration of the lithic material. In support of the tool manufacturing interpretation is a bison horn core shaved down one side and worked at the tip. This could have been used, like the numerous deer antler fragments, as a flaker.

The relationship of the two levels to one another and to the larger Plains culture history is an interesting puzzle. The stratigraphic relationship and preponderance of trade goods in the upper occupation indicates that it is later than the second. During this time trade goods in the Platte River Basin were coming mainly from the French via Comanches. By 1720 Villasur and his Spanish company were nearly annihilated by a force of Pawnees and Frenchmen on the South Platte in southwestern Nebraska. The 1739 expedition of Frenchman Mallet followed the South Platte River to within 80 km (50 mi) of the Lykins Valley site. The proposed date on the pipe manufacture of 1672 most likely is at least several decades earlier than it would find its way onto the plains and into a site. The radiocarbon date of this occupation also suggests a date of around 1655. However, as noted before, the radiocarbon date for the lower occupation dates it to between 1669 and 1797. The lower occupation, however, is clearly separated from the upper one by 5-7 cm of sand most likely alluvial sediment from adjacent Boxelder Creek. The other item that can be used to date the lower deposit is the single horse scapula. The earliest dates for horses in this portion of the Great Plains is about 1690. Thus, two separate, very different occupations have similar dates.

It seems likely that the radiocarbon date from the upper occupation level is a bad date. This still does not explain the date of the pipe, but like radiocarbon dates, pipestem diameter is a statistical inference and our sample is obviously small. It is possible that only a few decades separate these two occupations. It was suggested by Ohr et al. (1979) that the upper occupation represented a terminal, post-ceramic Dismal River occupation or Kiowa-Apache, with the Level 2 occupation an early Historic Plains Apache. The affiliation of the Level 2 occupation seems to be a sound one. Although it seems strange that no Dismal River ceramics are present, there is at least scanty evidence of a ceramic industry. However, it is more likely that the upper level is in fact a Comanche occupation. As such, it would explain the radical change in the two assemblages over a short period of time. Comanches were in the area in the early 1700s. They were much more involved in trade with the French and other traders and trappers than were Apaches. Because of their success in horse trading and breeding their Shoshonean language became the trade language of the entire Plains region (Fehrenbach 1974). The evidence of hide processing, especially

evidenced by the high number of scrapers and scraper fragments, would fit into this picture, as trade goods were often acquired with hides.

The Killdeer Canyon site (5LR289) consists of 18 stone rings, several of them dated by radiocarbon methods, range from 150 ± 50 to 360 ± 80 B.P. (Morris 1989). Two of the dates have been calibrated with a single intercept, one yielding a date of 1654, another 1641. The others have multiple intercepts, mostly ranging between the 1680s and the 1800-1810s (see Appendix, Table 4). Each of the five dates is slightly different, perhaps indicating repeated use of the area. No documentation is available on the size of the rings or whether robbing of stones occurred. The site is located in a canyon bottom close to a permanent spring (a locale that may also indicate repeated use). Artifacts collected from the site include triangular, side-notched, concave-based arrow points and fragments of a plain ceramic vessel. A few grinding slabs and mano fragments were also recovered. Some of the rings included central fire hearths and others did not, perhaps strengthening the supposition of repeated occupation as indicated by inferred summer and winter occupations. Small concentrations of retouched flakes were recovered from the house floors. The floors were smooth and hard and were slightly depressed toward the center of the ring. Morris (1989), who conducted the excavations at the site, identifies no clear cultural affiliation for the site. In her estimation it lacks the substantial trait list of a Dismal River site. The ceramics are untyped, although she takes care to proclaim them different from the Shoshonean sherds at nearby T-W Diamond, a Middle Ceramic stone circle site.

MOUNTAINS

Culture History

As supported by both the archaeology and ethnohistory of this subarea, the mountains of the Platte River Basin were utilized by a number of groups. Perhaps foremost were the Utes, often considered Colorado's mountain people. Most linguistic and archaeological data indicate that Utes were part of the expansion of Numic speakers from the Great Basin (Reed 1988). Based on his work for the Ute Prehistory project, Bill Buckles (1971) concluded that Ute culture could be an in situ development, as indicated by continuity between Ute and Late Archaic sites. Questions of origin aside, the complex of material culture identified specifically as Ute is obvious in the material record by AD 1100 (Reed 1988). The Utes practiced a hunting and gathering lifestyle extending back to the Archaic stage. However, they became embroiled in the workings of the Spanish Empire, and some members of the tribe were enslaved. When the Spanish retreated south after the Pueblo Revolt of 1680, the Utes headed north, returning to their homeland and taking a good portion of the Spanish horses with them. Throughout the course of the 1700 and 1800s, the Utes made use of a range of material culture made possible by greater mobility related to the horse and greater access to trade goods.

The most visible aspect of Ute sites in the Platte River Basin is Uncompahgre Brown Ware, a utility ware made by Utes until as late as the 1970s (Smith 1974:84). The vessels were generally jars with slightly flaring, wide necks, shoulders that ranged from poorly to well defined, and pointed or rounded bases. It is generally the base and shoulder that differentiates Uncompahgre Brown Ware from Intermountain Ware, which dates to the Middle Ceramic and is associated with the Shoshone (Eighmy 1995), although there is much overlap between the two

styles on a case-by-case level. Uncompahgre vessels were manufactured by coiling and then thinned by either scraping or paddle and anvil. Cross section inspections by David Hill indicate that paddle and anvil may be the primary method of thinning (Hill and Kane 1988). The vessels are generally plain or fingertip-impressed in horizontal rows (Reed 1995:124). Some stick-impressed sherds have been classified as Uncompahgre ware, including sherds from the Caribou Lake site just west of the Continental Divide and outside the Platte River Basin (Benedict 1985).

Unquestionably the most diagnostic artifact in the Ute complex is Uncompahgre Brown Ware; however, as noted above, care should be taken in analysis due to its similarity to Intermountain Ware. Other artifacts interpreted as diagnostic include Cottonwood Triangular projectile points, Desert Side-notched points and certain features, in particular wickiups and scarred trees (Reed 1988). Unfortunately, in the Platte Basin, the projectile points noted above are not diagnostic without accompanying sherds. For example, a Desert Side-notched point is actually very difficult to distinguish from a Plains Side-notched point (see Reed 1988: Figure B1). As Benedict (1985:23) writes of small side- and basal-notched arrow points, they cannot be attributed to specific tribal groups without other evidence, because similar points were used by diverse peoples on both side of the Continental Divide. Such points on the plains are dated to the entire Late Prehistoric Period (AD 900 to 1800s), which includes both the Middle Ceramic and Protohistoric periods herein. The fact that absolute dates for the Protohistoric come from multicomponent sites (and therefore mixed artifact assemblages) makes the problem of differentiation even more difficult. Without large comparative collections, further seriation will remain a problem.

Certain features are also often interpreted as diagnostic of the Ute. Wickiups are structures comprised of fallen or cut limbs leaned together to create a structure, usually conical. Historic documentation clearly indicates that wickiups were an important part of Ute material culture (Baker 1998). However, like projectile points, they are not a clear cultural marker. Ethnographic evidence indicates that wickiups were utilized by a number of other groups, notably Apache and Shoshone (Kidwell 1969).

Scarred or peeled trees are another feature often associated with Utes, as historic and ethnohistoric accounts of their use of bark abound (Martorano 1988). The scars are usually around 1.5 m long and 60-90 cm wide, often evidencing cut marks on one edge (Martorano 1988). The interior bark, or cambium, was utilized as a food source and for medicinal purposes. Clifford Duncan, a member of the Northern Ute (Uintah and Ouray tribes) recalled that trees were usually peeled by women and the inner bark was used in cooking and flavoring meat and as a medicine for stomach ailments. Sap was used as an adhesive and sealant for basket ollas. Hardened sap was ground for ceremonial use (Butler 1997:8). Martorano (1988) notes that the outer bark had many uses, both as a building material and to construct objects such as baskets and trays. Bark utilization was a well-established cultural pattern among Utes, and was practiced over centuries. However, historical accounts indicate that some Utes were driven to increased utilization of bark as a food source after territory infringement by Euroamericans (Martorano 1981). Tree-ring analysis of the scarred trees in Colorado indicates that the majority were produced in the early portion of the nineteenth century (Martorano 1981), a finding that may support such a conclusion. However, at least one Ute informant has refuted this, claiming that trees were primarily utilized in the late spring and early summer when the sap was flowing and the bark tasted the best (Butler 1997). Scarred tree site are usually assigned a Ute affiliation. Six Arapaho elders visited a peeled

tree site in Estes Park in 1997. None could recall the Arapaho ever using the inner bark of pine (Butler 1997). The peeling of trees, one elder commented, is really a Ute practice. The only other ethnographically documented group in this area to use bark substances is the Shoshone (Martorano 1988).

It is tempting to assume that mountainous sites in the Platte River Basin with late prehistoric points (small side-notched or triangular), wickiups, scarred trees, and/or trade goods are Ute. And in fact, that is most likely the case. However, ethnographic accounts and sometimes archaeological sites clearly indicate that Utes were not alone in their utilization of the region. The more northern bands of Utes were, at least until the 1700s, often in the company of Comanches. Comanches are Shoshonean speakers who probably split from the other Shoshone about the beginning of the Protohistoric period (Gunnerson and Gunnerson 1988). Shoshones were also known to utilize the mountains, especially the North Park area, which was the scene of Shoshone buffalo hunts (Murphey and Murphey 1960). In 1826, a fur trader named James Pattie came across a party of Shoshones who were armed with muskets, which they had apparently acquired in a skirmish with a party of French hunters at the headwaters of the South Platte River in South Park (Flynn 1947:14).

Plains-oriented groups also frequented the mountains of the Platte River Basin. Arapahos utilized the foothills and mountains on the east side of the Continental Divide, especially the Estes Park region. A particularly good source on the Arapaho in this area is Oliver Toll's (1962) account of a trip to the mountains with two Arapaho elders in 1914. The region is clearly a traditional use area populated with Arapaho names, traditions, and sites. For example, the Big Thompson River was called the Pipe River. Interestingly, raw material for pipes was not located in the area, and would have been imported. Still, it was known as the place where pipes were made, *haatja-noont-neechee* (Toll 1962:13). The use of the river for pipe production may be related to a general spiritual nature imparted to the region by Arapahos. Near the Pipe River is a knoll where sage chicken dances were held. Located east of Estes Park (perhaps Deer Mountain), the knoll was the site of repeated ceremonies, for as Toll (1962:14) was told, the sage chicken dance was a regular festival of the Arapahos, always held in the same place. Arapahos also were known to have utilized both North and South Park. While passing through South Park in 1844, John C. Fremont had to skirt around a battle between Utes and Arapahos (Fremont 1887). Cheyenne use of the region is less documented; however, travelers and traders identified them as frequent visitors (Flynn 1947; Lischka et al. 1980).

There are good reasons to believe that during the 1800s, mounting outside influences were a main cause of the overlapping territories of various Native American groups. Certainly the frequent references to battles and skirmishes in the region indicate that territorial lines were not firmly established. Still, it is becoming more clear that even in the early portion of the Protohistoric, Utes were probably not the only group using the mountains. Recent work by Jean Kindig (1997) in the Devil's Thumb Valley indicates that Dismal River groups may have been in the area of the Continental Divide. At site 5BL6904, the Devil's Thumb Trail site, she recovered ceramics attributed to Dismal River. There is reason to think that the presence of Dismal River sherds in mountain sites is not merely indicative of trade. One theory of the arrival of the Apaches (and one supported by oral history) is that they followed the Rocky Mountains in their journey south (Brunswig 1995), and thus were well aware of the resources in the mountains. The same factors that induced other Plains groups to utilize the region (abundant game, cooler climate,

geological diversity) would have appealed to them just as much. In his analysis of Dismal River pottery in Colorado, Brunswig (1995:180) identifies the Dismal River territory as extending into the foothills and mountains west to the Continental Divide. Husted (1964) identified Dismal River sherds at Old Man Mountain, although Benedict (1985a:21) prefers to refer to them as generalized Protohistoric style influenced by the micaceous utility ware of Taos and Picuris Pueblos .

Database

Protohistoric sites identified in the mountains of the Platte River Basin are found primarily in three areas, North Park, Estes Park, and South Park. The mountain parks were a critical region in the yearly round of Protohistoric peoples. During the summer the parks served as refuge from the heat of the plains (Flynn 1947:4), and appear also to have been utilized in the winter (Toll 1962). Throughout the year the parks were a good source of game. In fact, the general Arapaho word for the mountain parks translates to "game bag" (Toll 1962:18).

Protohistoric sites in the mountains, as elsewhere, are very often lithic scatters. More often, however, sites are open camps. The designation of campsite changes with the site recorder, but usually indicates the presence of hearths or fire-cracked rock. Sometimes the designation of campsite is made on the presence of ground stone, often interpreted as an indiction of greater duration of site use. Sites with stone circles are also common in the mountains. The more recently recorded stone circle sites are encoded on the OAHP database as "open architectural" sites, but often sites recorded as open camps in fact contain rock rings of some type. Other important Protohistoric site types include ceremonial sites, such as Old Man Mountain (5LR12), peeled trees (5JF27), and game drives, including Flattop Mountain Game Drive (5LR6).

Very few sites anywhere in the Platte River Basin have yielded absolute dates in the Protohistoric period. This is true of the mountains, where only eight sites have dates within this period. Table 4 (Appendix) lists these sites with the dates recovered. In general, the dates cluster around 200 to 300 BP, or cal. AD 1650-1700. Whether this marks a cultural reality is questionable. The clustering may be, to a certain extent, related solely to the difficulty of dating relatively recent charcoal. This assumed difficulty is supported by a series of dates in the 1800s, all of them from dendrochronology, which is accurate to the present.

Open Architectural Sites

The East Branch Wickiup site (5JA651) is perhaps the best example of an intact wickiup in the mountains of the Platte River Basin (Berrigan and Gilbert 1987). A single feature was recorded there, composed of 34 upright aspen poles leaning in a semiconical fashion against a mature lodgepole pine (Berrigan and Gilbert 1987:Figure B2). The aspen poles are ax-cut, although it is difficult to ascertain whether a stone or iron ax was used. The branches of the lodgepole pine that would have extended into the wickiup have also been removed with an ax. The interior of the feature measures 1.5 m × 1.8 m, with a height of 1.74 m. Pine needle duff covers the area around the wickiup to a depth of more than 7 cm and no artifacts were observed on the site.

Dating of the feature is problematic. Coring of the lodgepole indicated it was more than 135 years old. Cores taken from smaller pines in the immediate vicinity of the wickiup suggest that the pine would have reached a suitable height (i.e., above 3 meters) by age 35, which implies the wickiup could be at least 100 years old. No bark remained on any of the aspen poles, suggesting that the structure was not of recent construction. Based on these factors, the recorders dated the site between AD 1870 and 1890 (Berrigan and Gilbert 1987), which is just the beginning of the reservation period.

In 1988, as part of a survey prior to a controlled burn, three wickiup sites were recorded on Crosier Mountain just north of the Big Thompson River (Slay et al. 1989). Site 5LR1197 consisted of nine wickiups located in a wooded area. The wickiups were constructed of a combination of aspen poles and brush with rocks and live ponderosa trees used for support. Most of the aspen poles were still in place. Sites 5LR1198 and 5LR1199 contained five and three wickiups, respectively. They were constructed in the same manner as those at 5LR1197. No artifacts were located on any of these sites.

The Crosier Mountain wickiups are more problematic than the East Branch wickiup. Most of them utilize branches up to 7.6 m long, which would make the features much taller than ethnographically recorded wickiups. In addition, the interior branches of the ponderosa pines against which the aspen are leaning have not been removed. Whether the Crosier Mountain features are aboriginal wickiups is unknown. Aspen groves grow as a unit, and when they die, whole series of trees die and fall over. This may indeed have happened on Crosier Mountain. There is evidence, however, of wickiups in this region. Slay et al. (1989) note that a turn-of-the-century history of Larimer County includes a picture of a wickiup made of aspen poles (Watrous 1911). The history notes that the picture was taken near Estes Park.

The Placer Creek Tipi Ring site (5JA25) is located on the south side of Independence Mountain in North Park. Located on an open, grass-covered ridge, the site has exposure in all directions and an excellent view of North Park to the south. The ridge slopes gently to Placer Creek, about 0.4 km (0.25 mi) north of the site, which supports aspen groves. On the ridge are 16 stone circles. Six additional circles are located 122 m (400 ft) north of the main site. The site was originally recorded in 1973, at which time only one stone ring contained a hearth that had not been dug out by pot hunters. Designated Feature 12, this ring measured 4.6 m (15 ft) in diameter and contained a stone-lined fire pit 46 × 30 cm (18 × 12 inches [Hutchison 1973]).

The site showed clear evidence of vandalism and thus it is not surprising that few artifacts have been located on the site surface. A site reevaluation in 1976 noted, "Most of the hearths had been dug out and one 4-foot diameter hole had been dug in the middle of the site. Little cultural material was observed although the site was covered with quartz cobbles and fragments" (McGarry 1976). However, during initial recording, a .44 caliber rimfire cartridge was recovered. The cartridge dates between 1862 and 1900 (Hutchison 1973).

After an initial flurry of "tipi ring" recording, Colorado archaeologists have taken a step back from this site designation. A number of researchers, rightly, have pointed out that not all stone circles are tipi rings. Stone circles date from a variety of temporal periods, from 4260 ± 140 BP in Alberta (Burley 1991:351) to historic and modern times (Kehoe 1960). They also represent a range of cultural activities. They have been used to secure skin (tipi) or brush structures, as

outlines for vision quest and other ceremonial sites (Lischka et al 1983), as pits for game drives (Benedict 1975c), or for some other enigmatic purpose (Mulloy 1960). The fact that they are not often associated with high artifact counts is usually attributed to a combination of high mobility of the residents and high visibility of the sites (leading to greater collection and vandalism).

It is important, however, not to throw out the baby with the bathwater. There is good ethnographic evidence supporting the presence of tipi rings in the Platte Basin. Toll's (1962:35) Arapaho informants recalled that they consistently used stones to hold down the edge of their tipis until "after the white-man came" when tent pins became the norm. Grinnell (1962:254) observed that Cheyennes used stones to hold down the edge of their tipis when the ground was frozen, but used stakes in the summer. Grinnell's field work was completed in the 1890s, well into the reservation period. It is probably safe to assume that until the 1800s, the majority of tipi campsites would be marked by stone rings. In areas where the ground was hard or soil was thin, stones would have been a logical choice even when pegs were available.

Stone rings used to hold down tipis are typically 3.8 to 5.3 m (12.5 to 17.4 feet) in diameter (Malouf 1961). If used in the winter tipis will likely have a central hearth, but tipis used in summer campsites would often lack them. Especially in the mountains where dog travois were less utilized, stone circles in the range of 2-3 m are probably not tipi rings. Stone circles of significantly greater size, likewise probably served a different function. At one time "a distinct ring about 15 yards across" which was an "Arapahoe dance circle" was on a hill on the north side of Estes Park (Toll 1962:15). Other larger stone circles in Wyoming and Montana are often interpreted as medicine wheels (Powell 1990). The grouping of circles is also important. The majority of sites with stone circles associated with tipis will have a number of rings, rather than one or two (Powell 1990).

Returning to the Placer Creek site, it is clear that the site is a residential, tipi ring site. Most of the features fall well within the expected size range for tipi rings (e.g., Feature 1 is 4.3 × 3.7 m [14 × 12 ft], Feature 2 is 3.7 × 3.7 m (12 × 12 ft), Feature 3 is 4.0 × 4.3 m [13 × 14 ft], and Feature 5 is 4.3 × 5.5 m [14 × 18 ft]). The only undisturbed anomalous feature is Feature 7, a 3.0 × 3.4 m (10 × 11 ft) circle of small stones. The recorders noted that this circle was made of much smaller stones than any of the others. Feature 7 may have supported a brush structure or perhaps was related to children's activities. The number of rings present is consistent with an average nomadic band with horses. Finally, the rimfire cartridge (if associated with the occupation) appears to date this site to between 1862 and 1900, just into the Historic period, placing it well within the period for horse-drawn travois and tipi use in this region.

In their study of the archaeology of North Park, Lischka et al. (1983) set out the parameters for locations of winter occupations. They should be found on ridges adjacent to south-facing slopes, close to winter concentrations of big game, and close to sources of wood. The Placer Creek site, which is outside the area of their survey, meets these criteria. The ridge is generally clear of snow in the winter and near two of the highest deer and elk winter concentrations in North Park (Lischka et al 1983:222). The presence of hearths (mostly disturbed) in many of the features supports the idea that this was a winter occupation. The original site recorder identified this as a nineteenth-century Ute hunting camp. This designation was supported by the claim that other groups, especially Cheyenne and Arapaho, were in North Park only on short-term hunting or raiding expeditions (Hutchison 1973). Based on Toll's (1962:19-20)

narrative, however, the Arapaho had a more time-intensive use of the region, including several areas where "men went to fast." Rather, the Ute designation of this site can rest on a more material basis. First, at the time of the date indicated by the rimfire cartridge (1862-1900), Arapahos were using tent pegs and not stone. Second, Arapaho winter camps are characterized by depressions three or four feet deep, "the dirt dug out from under the tent being used to bank up the sides" (Toll 1962:35).

Open Camps

The 5PA414 site is located about 30 m south of the North Fork of the South Platte River in South Park (Gooding 1986). Located at an elevation of 2522 m (8275 ft), the site consisted of a lithic scatter with an associated hearth and a possibly associated rockshelter. The lithic remains at the site included two bases of corner-notched projectile points, 60 flakes, and 12 utilized flakes (Gooding 1986). The site was disturbed by State Highway 285 which cut through the center of the site. Exposed in the roadcut were most of the lithic artifacts, as well as a hearth starting at the present ground surface and extending to 25 cm below the surface. Charcoal from the hearth dates to 330 $\pm$50 BP. Calibration yields dates ranging from AD 1448 to 1663 with intercepts at 1525, 1558, and 1631.

The first terrace above the South Platte was heavily utilized by Protohistoric people. Zebulon Pike (1889:314-315) wrote the following of his 1806 journey along the Platte in South Park, "The prairie being about two miles wide, was covered at least six miles (on the bank of the river) with horse dung and the marks of Indian camps. . . . the sign made by their horses is astonishing, and would have taken a thousand horses some months." Site 5PA414 predates use of the horse in this area by about 100 years but indicates a continuity of use of this location from pre- to post-horse adaptations. The continuity of this site may extend even further. The projectile points located here are not the triangular, side- or unnotched points typical of the time (Gooding 1986:Figure B2). One collected projectile point from near the roadcut indicates that this may be a multicomponent site. Conversely, it could indicate reuse of older points by the Protohistoric residents.

The Tahosa Creek site (5LR647) is located on a small rise with a rock outcrop overlooking Tahosa Creek (Rowen 1981). A multicomponent campsite, the site yielded a range of chipped stone, mostly macro- and microflakes. A number of projectile point fragments were also recovered, including an extensively reworked Duncan-Hanna-Gypsum Archaic point, two Jimmy Allen points, and two Late Prehistoric points (a triangular point with burin facets and a Woodland corner-notched point base). The site was tested in 1981 and a hearth dating to 210 $\pm$ 45 BP was located about 18-25 cm below the ground surface (Rowen 1981). No artifacts were recovered from the hearth itself. The calibration of this date yields a range from 1641 to 1954. Given its location well below the current ground surface, later intercepts are ruled out, leaving three with the dates of 1669, 1786, and 1793.

The Tahosa Creek site was occupied at least twice during the Protohistoric period. In addition to the lithic artifacts, a piece of undoubtedly flaked clear glass was collected from the site surface. Clear glass is a relatively new technology, originally produced in the late 1800s, and would not have been available until about 100 years after the hearth was utilized (Carrillo 1994).

The Devil's Thumb Ceramic site (5BL102) was excavated in 1995. The site is a multicomponent campsite located in a valley just below the Continental Divide (Kindig 1996). During excavation of a nearby kill site, Devil's Thumb Valley game drive (5BL3440), a few plain, dark grey sherds were located on the surface, about 12 meters from an eroding hearth at site 5BL102. When the excavation proceeded, 100 additional sherds were recovered, as well as two unutilized flakes. Analysis of the sherds indicates they were from the same vessel with an uneven, undulating surface, smooth but without any surface decoration. With an average thickness of 5.8 mm and laminations indicating thinning by paddle and anvil, the vessel was interpreted as a "Plain Mountain Brown" ware (Kindig 1996). Although it could be either of the plain brown wares located in the region it is probably Uncompahgre rather than Intermountain Ware given the dating of the nearby hearth to 250 ± BP. That date, calibrated to AD 1640-1760 (Kindig 1996), is squarely within the range for Uncompaghre Brown Ware (Reed 1995), but several centuries later than that for Intermountain Ware in the Platte (Eighmy 1995).

Kindig (1996) suggests that the Devil's Thumb Ceramic site is part of the overall game drive system in the Devil's Thumb Valley. Protein residue analysis of the vessel indicates that it was used to cook bighorn sheep, a species also found at the Rollins Pass site, (5BL147), another game drive with a component dated to the Protohistoric (Olson 1971). The vessel, if indeed Uncompagre Brown Ware, indicates that this site was utilized by a Ute family group. That they were entering the valley from the west is indicated by sourcing of lithic material on the site to Middle Park (Kindig 1996). The dating of this site is corresponds with the terminal period of the pre-horse days of the Utes. If game drive systems were largely abandoned after the widespread use of the horse (Benedict 1996), this may represent one of the last uses of the Devil's Thumb Game Drive.

Game Drives

Three game drives located in the Platte River Basin have yielded Protohistoric dates, Rollins Pass (5BL147), Bob Lake (5BL127), and Flattop Mountain (5LR6). All three sites are located on the Continental Divide and consist of a series of long drive lines and hunters' blinds. The Rollins Pass Game Drive site was excavated by Byron Olson in the early 1970s (Olson 1971). Years later, James Benedict ran a number of the radiocarbon samples from that excavation. A date of 360 ± 170 BP was obtained from a very small sample (thus the long deviation). Benedict has calibrated the date from AD 1420 to 1670, with a center date of 1455. This places the site just before or near the beginning of the Protohistoric. Associated cultural material includes bone and debitage.

In 1996, James Benedict and E. Steve Cassells began work at the Bob Lake site (Benedict and Cassells 1996). So far they have identified three walls, 26 blinds and four natural hiding places marked by cairns. Coring of two of the blinds yielded Protohistoric dates. Neither Blind 20 dating to 280 ± 60 B.P., or Blind 3, dating to 310 ± 70 B.P. contained associated cultural material.

Benedict (1996) describes the Flattop Mountain site (5LR6) as one of the largest drive sites in the Southern Rocky Mountains. He estimates that the site consists of at least 90 hunting blinds, possibly a hunter's bed, and 14 rock walls and 848 cairns that create drive lines with an aggregate length of 4.0 km. The blinds are generally circular or oval, but about one-third are semicircular. These were built in locations where the game would be approaching downslope. A

number of the blinds utilize natural outcrops or boulders. Cairns were of four varieties. The most common was composed of tabular stone stacked three to five high. Artifacts recovered from the site are mainly chipped stone. In the blinds themselves, Benedict (1996:73) has identified flakes indicative of tool resharpening, an activity that serves as "a universal remedy for boredom among game-drive hunters."

A series of the blinds was dated using radiocarbon samples retrieved through coring. The ages range from 4310 ± 80 B.P. to 220 ± 50 B.P. Two blinds dated to the Protohistoric period; Blind 83 yielded the 220 B.P. age, and Blind 51, had an age of 240 ± 60 B.P. Benedict has calibrated both dates to within 10 years of each other, A.D. 1660 and A.D. 1650, respectively. No artifacts were retrieved from either of these blinds. A variety of projectile points has been collected from the site through the years. More than half of those documented by Benedict (1996) are Mount Albion (Early Archaic) points. Interestingly, although two blinds date to the Protohistoric, only one Late Ceramic/Protohistoric point has been collected on the site. A small triangular side-notched point, Benedict (1996) attributes it to either Arapaho or Ute use of the site. Both groups used Arapaho Pass and Flattop Mountain to cross the Continental Divide (Benedict 1996). Based on analysis of geological factors and lichen growth, it appears that the Protohistoric use of the site did not include any new construction. Rather, these late-comers utilized a system long in place.

Kill Sites

The game drive systems described above are the remains of a specific type of communal hunting. Other types of drives, specifically those meant for animals that range in larger herds, result in extensive kill sites, as opposed to the smaller drive line and hunters' blind sites. Just one kill site in the entire Platte River Basin has a component that is definitively dated to the Protohistoric. It is tempting to say that such a lack of dated sites indicates changing resource utilization patterns with the acquisition of the bow and arrow followed by the use of horses, but the Protohistoric dates at the smaller game drives argue otherwise. Perhaps the best explanation is the difficulty in assigning projectile points to the Protohistoric rather than a general Late Prehistoric affiliation.

The Coffins Buffalo Kill site (5JA7) is located on the east side of the North Platte River valley adjacent to a granite boulder wall. Against this wall, buffalo, antelope and deer were driven, compounded, and slaughtered. Excavations performed on a small knoll against the wall by Roy Coffin, an amateur, yielded large quantities of bone and more than 2,000 arrow points (Wheat 1954). Lischka et al (1983) suggest that a bison trap site excavated by the Coffins and described by Johnson (1972) is in fact 5JA7. Johnson reported that two crudely made steel projectile points were found on the site. The majority of the 181 Coffins artifacts at the Fort Collins Museum are small, side-notched projectile points suggesting to Lischka et al. (1983) a Late Prehistoric age for the site (A.D. 500-1540), however the steel projectile points would extend the possible dates through the end of the Protohistoric.

The Coffins Buffalo Kill Site is located in an area called Northgate, where the North Platte River goes through a narrow canyon. Lischka et al. (1983) suggest that this area may be the one referred to by Arapahos as "The Door." In Toll (1962), The Door is described as where the North Platte crossed the Medicine Bow Mountains, but in fact the North Platte does not cross the

Medicine Bows at all. The Door, as described in Toll, appears to match the physical layout of 5JA7. "On the east side of the mountain," Toll (Toll 1962:20) writes, "the Arapaho used to drive game up through the gap, where some of the hunters would be stationed to kill game." The presence of metal projectile points indicates that during the Protohistoric or Historic period, Native Americans used this site, whether or not they were of Arapaho affiliation.

Ceremonial Sites

The actual number of ceremonial sites in the mountains is surely much higher than that recorded. Ethnographic evidence indicates that the mountains were often a place for group ceremonies and individual spiritual journeys. One possible ceremonial site is located on Owl Ridge in North Park. The site, designated 5JA47, is a multicomponent site with Middle and Late Archaic components as well as a Protohistoric component. The site consists of about 30 stone structures. Like 5JA25, the Placer Creek Tipi Ring site, this site is located in an ideal area for winter occupations (Lischka et al. 1983:222). Owl Ridge is also identified by Toll (1962:20), described as a spur between the Michigan and Illinois rivers which the Arapahos called Fasting Butte. Lischka et al. (1983) suggest that the Arapaho name for the site may reflect a particularly hard winter spent living here. However, Toll's account indicates a more specific ceremonial use one of those places where men used to fast, suggesting a vision quest site.

Miller (1979:234) interprets the remains at the Owl Ridge site as a camp. It has at least two concentrations of stone circles. In the east concentration, the hearths are outside the rings and located in such a way that if used at the same time as the rings, the prevailing southwesterly wind would have blown the smoke away from the dwellings (Miller 1979). Artifacts were located both near and inside the hearths and inside the rock rings. Such an arrangement indicates not a winter occupation, but one utilized during a warmer time of year. How such a site relates to vision questing is unclear. It may be that individuals left from the camp, using a different area of the ridge. They may also be unrelated. Further consultation with Arapaho informants could perhaps make this connection more clear. Certainly the knowledge of the archaeological footprint of Arapaho sites is scanty at best. If an ethnographically known location and an archaeological site could be linked (as it was for Dismal River), it could be very fruitful for more refined designations of cultural affiliations of Protohistoric sites.

The best known ceremonial site in the Platte Mountains is Old Man Mountain (5LR12), a vision quest site located just outside Estes Park. "The Arapahos had noticed the same figure that we see in Old Man Mountain. They called it Sitting Man, *hinantoXthauXut*. They said that Indians often fasted on the top of the hill" (Toll 1962:13). The site was recorded by James Benedict (1985a), who did an outstanding job of reviewing the ethnographic data on vision quests and showing how Old Man Mountain fits the profile for such sites. Like many vision quest sites, Old Man Mountain is a high and remote place, affording a spectacular view, in this case of the Estes Park region and the Continental Divide. The site consists of a conical granite knob with five artifact localities on the approach to the outcrop. The artifacts include transported boulders, chipped stone (with a percentage of obsidian much higher than normally found in Front Range sites), a steatite vessel and a wide variety of ceramics including Woodland, Fremont, Pueblo, Shoshoni, and Ute wares. Benedict (1995a:10) has interpreted artifact concentrations as way stations for those embarking on vision quests. Here people would have stopped to smoke, pray, and leave offerings while ascending the mountain.

Unlike recorded vision quest sites in Wyoming and Montana, the top of Old Man Mountain lacks the oval or U-shaped rock fasting beds. Benedict (1985a:11) suggests that the top has been stripped by collectors or that any loose artifacts on the top of the knob were swept to the valley floor by erosion. The wide range of vessels represented indicates the use of the site by various groups. The Fremont and Puebloan wares have been interpreted as trade goods, more likely to be used as offerings because of their elevated value (Benedict 1985a:22). A steatite vessel fragment was also recovered. Benedict (1985a:23) suggests a possible source for this steatite about 270 km away in the Laramie Range. Based on the artifactual remains combined with the geology of the site itself, Benedict has suggested that several other nearby sites are also probable vision quest sites, including the Caribou Lake site in the Indian Peaks Wilderness area and the Forest Canyon Pass in RMNP. Eight pieces of a steatite bowl were found at Beaver Point, only 1.4 km (0.9 mi) from Old Man Mountain. The location may either represent a vision quest site itself, or a locale for offerings for those traveling from camps on the Big Thompson River to Old Man Mountain (Benedict 1985a).

Scarred Trees

A scant number of culturally scarred trees have been identified in the mountains. This may be due to a combination of oversight on the part of researchers, the difficulty of finding individual trees in large stands, and the fragility of the resource itself (Martorano 1988). Certainly the region contained a multitude of ponderosa pine (the favorite for utilization) and a high occupancy rate by groups who were known to utilize bark, particularly the Utes.

Site 5JF27 consists of a group of about 10 trees located near Buffalo Creek. When this site was recorded, a small group of local residents came forward with stories their parents told them about Utes camping along the rivers in the area (Doll 1977). The site itself yielded no artifacts, although a small lithic scatter of 10 flakes and a projectile point was identified nearby. As part of her research on Colorado scarred trees, Martorano (1981) dated eight of these trees using dendrochronology. The dates of the scars range from 1844 to 1861. Except for a grouping of three scars in 1859, the rest date to different years, with a nine-year gap between 1845 and 1854. The repeated use of a particular stand of trees appears to be fairly common. One group of trees recorded by Martorano in the San Luis Valley was utilized from 1815 to at least 1938 (1981:111). Why a particular group of trees would see such repeated use is unknown. Ethnographic evidence indicates, however, that certain trees are better tasting than others (Martorano 1997). Perhaps once a band was aware of a "good" stand, it returned over decades to the same spot. Interestingly, such an assertion may contradict the idea that bark was utilized primarily in times of nutritional stress. Repeated use over time indicates a less expedient, more planned use of bark resources, a pattern supplemented by Ute informants (Butler 1997).

Other scarred trees in the mountains of the Platte River Basin have been recorded in South Park (5PA569 and 5PA570) and in RMNP (5BL7096 and 5LR2193). Site 5PA569 includes three scarred trees and a large jasper core. Sites 5PA570 and 5BL7096 are single, isolated trees. The latter exhibits a 15 cm-long ax cut on the bottom of the scar. Included at 5LR2193 are four peeled trees, three of which appear to have been peeled aboriginally. One of the trees includes both a large scar (100 × 35 cm) and two small scars (15 x 5 cm and 28 x 12 cm). Martorano (1989) notes that trees were often tested for quality by cutting an area 15 to 20 cm long for sampling. Dendrochronological dates indicate that the trees were peeled ca. 1890, roughly 20 years after the

beginning of the reservation period for the Utes. These late dates coincide with other evidence that aboriginal groups in Colorado continued to utilize traditional lands for decades after they were removed to reservations (Church 1999; Clark 1997).

CONCLUSIONS

There is obviously much left to be discovered about the Protohistoric period in the Platte River Basin. Archaeologists are still in the position of building a basic culture history. Such a project involves the identification of "archaeological cultures," with site typologies, cultural chronology, and basic interpretation. In studying the Protohistoric period, the ethnographic and ethnohistoric record can be used to assist researchers. Archaeologists are at the same time hampered by the difficulty of obtaining accurate absolute dates and the lack of truly diagnostic artifacts. The problem of dating projectile points or assigning cultural affiliation based on them is due both to the similarity of suites of material culture utilized by Protohistoric groups and the long temporal span of point types utilized during this period. Diagnostic artifacts, however, are made, not born. If researchers begin to pay much closer attention to the artifact and material types present in sites with solid absolute dates or with other cultural markers (e.g., ceramics), patterns may conceivably begin to emerge. With regard to better cultural affiliation, the written record is available, which to date has been successfully used to link Dismal River sites to Apachean groups. Several sites discussed here have possible ethnographic links. These sites should be seen as highly significant for they may be the key to identifying, for example, the footprint of Arapaho sites. In such instances research should not only involve ethnographic research, but also oral history.

This is essentially an advocation of the "direct historical approach" as spelled out midcentury by Julian Steward (1942). Such "rosetta stone" sites may not be forthcoming, but researchers working in areas with a known ethnographic presence (e.g., Estes Park) should make every effort to be familiar with the written record. Such a move begins to break down the barriers between prehistoric and historic archaeology, a strategy strongly suggested by many involved in culture contact archaeology (Kirch and Sahlins 1992; Lightfoot 1995). Indeed, a number of the sites discussed here fall past the somewhat arbitrary cutoff date of 1860; however, they provide information relevant, perhaps crucial, to those interested in the Protohistoric and prehistoric material record. As Lightfoot (1995:200) asserts, "the current separation of prehistoric and historical archaeology detracts greatly from the study of long-term culture change." One possible reason for the lack of identified Protohistoric sites may be the misidentification of sites with Euroamerican goods as multicomponent rather that a single site with an admixture of material culture. Just as archaeologists cannot assume that all lithic artifacts were used only by people of Native Americans origin (Carrillo 1999; Moore 1992), they also cannot assume that all Euroamerican manufactured goods were used by Euroamericans.

THEORETICAL CONSIDERATIONS

In order to begin building the culture history of the Protohistoric period, researchers need to address certain questions, such as:

- What is the nature of the Dismal River occupancy of the Platte River Basin? Is there a discernible difference between sites before and after the introduction of the horse? Are there actually Dismal River projectile points? Are there architectural sites of Dismal River affiliation in the Platte River Basin? (e.g., is Cedar Point Village in fact a Dismal River site?)

- Can we identify specific Plains Buffalo culture sites by cultural affiliation (Cheyenne versus Arapaho versus Comanche)? Ethnographic accounts indicate that winter occupations of Arapahos should exhibit fairly significant depressions associated with tipi locations.

- Is there a way to identify Protohistoric tipi rings? Many of the region's stone ring sites dated to the Protohistoric period have poor descriptions of the morphology of the rings (circumference, size of stone utilized, evidence of repeated use/stone robbing, possible location of doors, presence or absence of hearths).

- What is the relationship of Protohistoric groups and sites to Middle Ceramic Shoshonean sites, such as Graeber Cave and Cherokee Mountain Rockshelter? Is there enough continuity to argue that groups who produced those earlier ceramics can be associated with a historically known group?

- Did lithic production and procurement strategies change after the introduction of metal and the horse? There are many sites with metal projectile points. Do the lithic artifacts look different from those at earlier sites? Research at Protohistoric Pawnee sites suggest that the introduction of the horse allowed the transportation of larger amounts of stone, leading to the production of less durable, more expedient tools (Hudson 1993).

DATA GAPS

In identifying data gaps it is easy to say that the entire temporal period is a data gap. However, there are specific data that would do much to enhance the understanding of the era and help researchers begin to address the above research questions. Directions for future field research are suggested below.

- Sites with the capacity for absolute dates in the Protohistoric period.
- Sites linked to ethnographic/ethnohistoric sources.
- Excavatable/excavated Protohistoric sites.
- Comparative collections with good dated projectile points.
- Carefully recorded stone circle sites.
- Scarred tree sites dated by dendrochronology.
- Datable sites with either a single Protohistoric component or clearly separate multiple components.

There is also good reason to delve into current collections for further analysis. For example, the Starlite Ridge site appears to be Dismal River. About 5 g of charcoal were collected, but never analyzed. With AMS dating, smaller charcoal collections are now datable. Other

collections can be reanalyzed to better distinguish ceramic types and lithic technology. Such analysis, in combination with continued and carefully recorded field research, may help to solve the puzzles of the Protohistoric occupation of the Platte River Basin.

Chapter 8

NATIVE AMERICAN CONCERNS AND INTERPRETATIONS

Terri McBride

INTRODUCTION

Since the 1980s, the archaeological community has paid increasing attention to Native American concerns about archaeological investigations that may have an impact on their ancestral heritage and the repatriation of culturally significant archaeological remains. These concerns eventually led to the U.S. Congress' passage of the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990 (H.R. 5237). This legislative act and the 1992 amendments to the National Historic Preservation Act (NHPA) (16 USC. 470w-3) have permanently altered the process of cultural resource management in the United States. Additionally, the repatriation of remains and consultations with affiliated Native American tribes have focused attention on other areas of concern, such as interpretations of the archaeological record that reflect Native American values and views of the past, traditional cultural use areas without tangible properties, and the incorporation of Native American beliefs and bodies of knowledge in archaeological inquiry and interpretations. Finally, preservation of cultural remains is extremely important to Native American groups today, and this is an area in which archaeologists can assist.

Included in this chapter are a summarized description of historic preservation laws, a discussion of the consultation process, a discussion of ethical considerations that should be taken into account when working with tribes and interpreting the archaeological record in the Platte River Basin a discussion of Native American sources of knowledge pertinent to our understanding of the past, and an explanation of cultural significance of sites, highlighting specific examples of these types of sites in the South Platte Basin.

HISTORIC PRESERVATION LAWS

Several legislative acts and executive orders help to preserve and protect sites important to national, local and cultural heritage, beginning with the NHPA of 1966 and ending with the NAGPRA passed in 1990. Copies of these and state legislative acts are available at the OAHP. A cursory view of the laws as they pertain to Native American groups follows.

National Historic Preservation Act

Originally passed in 1966 and amended in 1992, this requires "consultation with Indian tribes, Native Hawaiian organizations, and the interested public regarding means by which adverse effects on any National Register-eligible district, site, building, structure, or object will be

considered" (McKeown 1997a:19). The types of areas eligible for nomination to the NRHP may now include traditional cultural properties (TCPs) without tangible, physically apparent attributes (Hutt 1997:29).

Executive Orders and Memorandums

These require executive departments and agencies to consult "prior to taking actions that affect federally recognized tribal governments" (McKeown 1997a:19). Usually such actions are involved with activities conducted under the National Environmental Policy Act (NEPA), American Indian Religious Freedom Act (AIRFA), Archaeological Resources Protection Act (ARPA)(16 USC. 470Hh), and the Federal Land Policy and Management Act. Each of these regulates how the consultation process is conducted (McKeown 1997a:19).

Native American Graves Protection and Repatriation Act

Passed in 1990, NAGPRA requires full consultation on the entire repatriation process, including determinations of individual ownership of remains, associated burial objects, sacred property, and objects of cultural patrimony. NAGPRA goes beyond the notification requirements of ARPA and NEPA in that ongoing, two-way *consultations* must be conducted, instead of a "one-way agency-to-tribe" communication flow (Hutt 1997:29). The consultations should be with federally recognized Indian tribes, Native Hawaiians, lineal descendants, and/or traditional spiritual leaders in order to establish culturally appropriate disposition or repatriation of remains, funerary objects, sacred property or other objects of cultural importance.

Other Legislation

A number of other laws in addition to the above deal with the public release of information on sites. The Freedom of Information Act provides the right to access agency records to any person who requests them; however, The NHPA allows for withholding of information about the location, character, or ownership of sites, features or objects eligible for inclusion in the NRHP. This is another critical area of concern for tribal representatives and traditional cultural leaders. The Archaeological Resources Protection Act "prevents the disclosure of information on the nature and location of archaeological resources that require a federal permit for excavation or removal (with some exceptions)" (McKeown 1997a:19).

CONSULTATION PROCESS

With the 1992 amendments to NHPA and requirements of NAGPRA, a new emphasis on the consultation process has been realized. The importance of person-to-person dialogues, as opposed to obligatory letters of notification, has been noted by archaeologists, federal agencies, and tribal entities. The common meaning of consultation is to "ask advice of someone" (McKeown 1997a:16). Usually, a productive consultation involves one party who has expertise or simply familiarity with the issue at hand. In the case of NAGPRA, or in the identification of culturally significant sites under consideration for nomination to the NRHP, an appropriate consultant would be a member of the associated cultural group or a specialist of a cultural group.

Consultation should not be confused with "notification" or "obtaining consent" (McKeown 1997a:18). Consultation is always a dialogue and generally an ongoing process (one meeting is usually not enough). Notification is simply to give or make known information, and it usually occurs after a decision has been made (McKeown 1997a:18). This is not the process intended to take place in NAGPRA- or NHPA-mandated consultations. However, obtaining consent is not mandated in either of these acts, because obtaining consent usually implies that only one of the consulting parties has decision-making power. This is different from a dialogical conversation or counsel.

Face-to-face meetings are extremely valuable in a consultation. These meetings facilitate among other things a dialogue, an open forum for opinions to be expressed, and offering of advice. The consultation process should be arranged early in the project; as noted above, consultations that take place after decisions have been made are not very productive.

It is useful to have a list on hand of contacts of regionally affiliated tribes, traditional religious leaders, and lineal descendants when beginning a project. The OAHP has frequently updated listings of tribal consultants. If investigators discover human remains or associated objects that may be affiliated with a tribe, legally they have three working days to contact tribal representatives.

It is important to keep a record of consultations. NAGPRA requires documentation of consultations or consent given prior to excavation of human remains, funerary objects, sacred objects, or objects of cultural patrimony. Documentation should cover topics discussed, copies of written correspondence, and meeting notes (McKeown 1997b:27)

When planning interpretive displays, consultation with affiliated tribes is also recommended to make sure the displays comply with NAGPRA (for example, images of human remains may not be displayed) and to additionally ensure they are culturally appropriate (Sucec 1997:54). If there are conflicting opinions concerning the interpretation of a site, then consultation with Native Americans is especially warranted so that their interpretations may be included along with others in the display (Sucec 1997:55).

Types of Tribal Consultants

The following is an explanatory list of the types of federally recognized Native American individuals or groups to be consulted concerning repatriation and determination of cultural significance in archaeological investigations.

Indian Tribes

These are defined as any federally recognized Indian or Alaska Native tribe, band, nation, pueblo, village or community. Further definition of groups by both NAGPRA and NHPA includes "any Alaska Native village as defined in the Alaska Native Claims Settlement Act, eligible for the special programs and services provided by the United States to Indians" (McKeown 1997a:20).

Traditional Religious Leaders

NAGPRA defines these as persons recognized by tribal organizations as "responsible for duties relating to ceremonial or religious traditions or a leader in cultural, ceremonial, or religious practices" (McKeown 1997a:20).

Indian Religious Leaders

This definition is given in Executive Order 13007 as "a member of a federally recognized Indian tribe to be the appropriate authoritative representative of an Indian religion" (McKeown 1997a:20).

Lineal Descendants

NAGPRA defines a lineal descendant as "an individual tracing his or her ancestry directly and without interruption by means of the traditional kinship system of the appropriate Indian tribe or Native Hawaiian organization or by the common-law system of descendance to a known Native American individual whose remains, funerary objects, or sacred objects are being claimed" (43 CFR 10.2 [b][1]).

Interested Public

Consultation with the interested public is required under the National Historic Preservation Act, a general category that may include non-Indians as well as members of Indian tribes not necessarily associated with the remains or cultural items in question. This process usually involves an announcement in the public notices section of the local newspaper that states plans for land development or invasive archaeological studies, giving concerned citizens ample time to comment. The interested public may also include Indian tribes that are not officially recognized by the Secretary of the Interior.

ETHICAL CONSIDERATIONS

In addition to complying with historic preservation laws, an archaeologist should be aware of a certain code of ethics in working with remains of cultures other than his or her own. Basic courtesy and openness is a good starting point for working with or for Native American groups. Some level of socialization is also recommended, as "the nuances of interpersonal relationships help define the boundaries of ethical behavior" (Ferguson 1984:224). These cultural boundaries are helpful for non-Indian archaeologists to recognize. At times, the socialization process can ease tension on the part of tribal members surrounding an archaeological study, so that they feel comfortable asking the archaeologist questions about the project, archaeology in general, or other research areas (Ferguson 1984:228). Most importantly, this socialization and interaction goes far in establishing trust between the investigators and Native American groups, trust that is imperative if one expects to gain useful knowledge from tribal members (Martin 1997:132).

Cultural relevance is another side of archaeological investigations that must be considered. This issue is tied to the modern Native American perspective that views human remains,

associated artifacts, and other cultural resources as extremely critical issues. Initial consultations with tribes that may perceive potential impacts of intrusive studies, excavations, and development proposals, for example, should include questioning the tribal members about their own informational needs in respect to prehistory, history, and their ancestral heritage in general (Lipe 1974:218). In this way, archaeologists will be responsible to more than a single constituency, and they should be able to fit various constituencies' needs into their research model. This touches on another point: *flexibility* in research methods is required when dealing with cultures other than one's own. Archaeologists should be aware that a predetermined research design or methodology may or may not be culturally relevant or appropriate to a Native American group (see Jackson and Stevens 1997:139). However, if the archaeologist approaches the group members with respect and honesty, often the group will allow him or her to follow the research plan without modifications.

Frequent and open communication cannot be stressed enough with the tribe whose heritage may be affected(Kluth and Munnell 1997). This may lead to public education meetings or the education of interested individuals on a one-to-one basis. Educational opportunities are optimal outcomes of working with small communities, and these may lead eventually to another ideal opportunity—the hiring of qualified Native Americans to work on projects where a tribe may perceive potential impacts to their heritage or their land. Education will also strengthen the stewardship role of rural residents of cultural resources (Lipe 1974). Again, increased interaction with tribal consultants and other tribal members will ultimately expand Euroamericans' understanding of prehistory on this continent (see Ferguson 1984). However, tribal consultants may not always represent community-wide views, and archaeologists may find themselves in sticky political battles that they may not be aware of or prepared for (McGuire 1997:81).

A humanist approach may be the most appropriate and productive one to adopt when working with Native Americans on any level of an archaeological project. This requires the researcher to separate value judgments from scientific inquiry (as best as possible), to recognize the impossibility of achieving a model of prehistory completely void of cultural values and biases, and to carry out research with the understanding that the conclusions will have an impact on the descendants of the people he or she is researching (Winters 1984:45). A humanist approach is a most valuable aid in bridging the gaps between the types of knowledge used by Euroamerican researchers and those used by Native Americans. In addition, this approach can add a human quality to oftentimes faceless reconstructions of the past.

Archaeologists working with tribal groups can further enhance educational programs by maintaining close communications with educators, coordinators of museum educational programs, and even textbook publishers to offer an updated and enhanced understanding of this nation's past (Lipe 1974:218). Archaeologists may also find themselves in a position to assist tribes in both memorializing their own past and protecting significant sites, and to recruit young tribal members into the discipline of archaeology.

TRIBAL KNOWLEDGE

Tribal members, departments, programs, tribal attorneys, and others can provide a vast store of knowledge about their culture. Researchers working in consultation with Native American groups should also be aware that much of this valuable information is not published, or if it is, it

has been sparsely distributed. This is because in Native American communities, most historical, cultural, religious, and political knowledge is transmitted orally. Tribal elders and other members may have very specialized knowledge unique to them, which will be reflected in their understanding and experience within their group. Some of this information is freely shared with people outside the tribe, whereas conversely, some information is held privately by certain tribal members and is not shared with other tribal members, much less members of the general public.

Only the tribe or appointed representatives can authorize the release and use of tribal knowledge. Further, not every tribal member has this authority. CRM managers and other staff should strive to make contact with the highest-level government official possible in the tribe when gathering oral or documented histories and then proceed in accordance with his or her recommendations.

Obtaining oral histories may be the only way to acquire a pertinent piece of information that is otherwise unrecorded. Additionally, documenting particular oral histories may be beneficial to the tribe as well as the archaeologist, because as each elder in a tribe passes away, a tremendous amount of valuable information is lost. This ethnographic data may greatly add to interpretations of a site utilizing multiple viewpoints, and as such, research for interpretative displays and brochures should include a search for these oral traditions in archival material or through interviews.

Many tribes have members specifically designated to provide tribal histories and knowledge of language and culture. Therefore the tribe should be consulted first for a recommendation of the appropriate specialists or "experts" in regard to their history and culture. Finally, any written documents prepared about tribes should always be reviewed by the appropriate tribal representative(s) before distribution (Burney and Lovejoy 1994:152).

TYPES OF CULTURALLY SIGNIFICANT SITES

TCPs and/or natural features important to Native American groups are usually recommended eligible for the NRHP under Criterion A, if "its importance has been ethnohistorically documented and if the site can be clearly defined" (National Park Service 1982:47). Several categories of sacred areas may be appropriate in the consideration of present state and federal cultural resource management regulations, and the preservation of spiritual components of Native American cultures. These include 1) TCPs, 2) sites with intangible spiritual attributes (ISAs), and 3) contemporary use areas (CUAs) designated for prayer, wild plant gathering, hunting, and offerings (Burney and Lovejoy 1994:208).

A TCP is defined as "one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990:1).

TCPs include areas traditionally used for the gathering of wild foods or medicines or any geographical area or landform associated with Native American traditions or belief systems (Burney and Lovejoy 1994:208). Clearly, these types of areas may be extremely difficult for

Euroamerican archaeologists to identify. One example would be a location where Sun Dances had been held. A location such as this would be considered sacred to particular Native American groups, but to the Euroamerican archaeologist, this site may not look different than the surrounding environs (Burney and Lovejoy 1994:209). In fact, there is a location near Fort Lupton where an intertribal dance was held in the summer of 1843 by several thousand Arapahos, Cheyennes, Sioux, Comanches, Blackfeet, and Arikaras (Gunnerson and Gunnerson 1988:x), that today is considered a holy site.

Sites with ISAs do not usually meet the requirements of a "property" with special physical characteristics or cultural markers that would point to ceremonial use, traditional practices, events, or historically significant individuals (Parker and King 1990). These sites may be mountain tops or high hills affording a good vantage point, spring sources, or lakes, for example. Additionally, these are difficult to ascribe to the prehistoric period, and perhaps archaeologists should not be independently evaluating these properties. Another type of cultural locality is the CUA. This is an area that is used contemporarily by Native American groups (at times continuously used since the beginning of the historic era) either for ceremonial purposes (dances, gatherings, offerings) or the gathering of wild foods or medicine (Burney and Lovejoy 1994:210). Again, this may not be the type of property that archaeologists alone should assess. But because "sacred geography" is an essential feature to most Native American religious beliefs, continued accessibility to traditional use areas is paramount to the endurance of these religions in the present (Walker 1991). Both the Advisory Council on Historic Preservation (ACHP [n.d.]) and the U.S. Commission on Civil Rights (CCR [1983]) recognize Native American perceptions of sacred geography.

Although Native Americans believe this entire planet (Mother Earth) is sacred, including trees, mountains, rocks, rivers, lakes, springs, waterfalls, plants, animals, caves, and other earthly items and locales (Burney and Lovejoy 1994:210), some sites and areas found in the Platte River Basin are of special significance. Anthony Sitting Eagle of the Northern Arapaho Tribe related to archaeologists that the entire Colorado Front Range is considered sacred (Burney and Lovejoy 1994:209). Sacredness is also ascribed to places Native Americans have once lived, visited, or buried their dead (Jackson and Stevens 1997:137), as well as trails they traveled (Burney and Lovejoy 1994:210-211). In the Rocky Mountain region, sites normally considered sacred are mountain tops, waterfalls (in this study area, Boulder Falls is one example), confluences of rivers and trails, and headwaters of streams and rivers, among other natural features (Walker 1991:108, in Burney and Lovejoy 1994:211). Investigators will benefit by keeping this concept in mind while surveying areas in northeastern Colorado.

Other areas that are considered sacred by certain tribes include "ecotones," that is, transitional zones between two or more ecological zones or culture areas (Rhoades 1978). For example, the Garden of the Gods, Red Rocks Park, and Roxborough State Park are all located within a transitional zone between prairie grasslands and mountain forest. These ecotones usually include a larger floral and faunal diversity than either ecological zone bordering these areas, and are usually considered sacred (Rhoades 1978:608-613). Note that these areas also include unique geographic features, another identifier for possible cultural significance. Most of the northern Colorado Front Range should be considered an "ecotone" during investigations, and should therefore receive special attention on the part of investigators in this unique area.

Culturally modified sites such as pictographs, petroglyphs, and medicine wheels may signify a ritual function. Since the mid-1980s, the cultural significance of a rock alignment at Boulder's National Institute of Standards and Technology (NIST) campus has been controversial. The controversy focused on the belief by certain Boulder residents that this was a traditional cultural property formerly utilized by Native American groups. Others (including the former groundskeeper) claimed this alignment was formed by field clearing activities in modern times (Burney 1994:28).

Three different archaeological and archival projects determined that these rock features, alleged to be a medicine wheel, were not culturally significant to affiliated tribes. The last investigation, carried out by Burney and Associates for the U.S. Army Corps of Engineers (Burney 1994), included archival research, field investigations, and consultations with tribal representatives from 14 tribes in the region. The main concerns addressed during this study and its associated consultations with traditional spiritual leaders were 1) to assess the NIST campus to determine whether a medicine wheel exists there in a physical or spiritual form, 2) to assess whether the NIST campus is associated with some other spiritual or religious significance, 3) to evaluate any perceived significance by tribal groups' leaders in light of proposed development on the NIST campus for compatibility, and 4) to facilitate a formal blessing, agreed upon by the consulting delegates, of the property (Burney 1994:265). One should note that some Native Americans believe that there are possibly sacred features on this property. The efforts carried out by the archaeological investigator in this case can serve as an exemplary model for future investigations at questionably significant sites. However, the problems that archaeologists and other investigators will confront each time they encounter a controversial feature or site such as the "Boulder Medicine Wheel" will be unique and often difficult.

In general, medicine wheels are a feature of Northern Plains tribes and hold multiple types of significance. "Medicine wheel" has been used as a generic label for certain types of rock alignments ever since the identification of the Big Horn Medicine Wheel in Wyoming, although a universality of significance and function in these rock alignments is tenuous at best. Perhaps as many as five to six million of this type of rock alignment have been constructed by Plains tribes, although many of these are actually tipi rings or simple, unrelated alignments (Eddy 1977). Brumley (1988) researched dozens of stone alignments that may have functioned as medicine wheels, and specified several defining characteristics that can be used to identify these resources and evaluate significance. These characteristics include the following:

- The material from which medicine wheels are constructed is often unmodified stones, sometimes with soil used to further define the central cairn feature.
- The entire feature consists of at least two of the following components: 1) a pronounced central stone cairn of varying size, 2) single or multiple concentric rings, which are for the most part circular, and 3) two or more radial "spokes" from the central cairn feature, center point, or the margins of a center ring.
- Medicine wheels are comprised of a "generalized and radially symmetrical" (Burney 1994:36) formation of the above main components.

Medicine wheels have been significant to various Plains tribes, including (but not limited to) the Crow, Arapaho, Cheyenne, Sioux, and Blackfoot (Burney 1994:34). In broad terms, medicine wheels possess a "cosmic" meaning, signifying the spiritual connection of an individual

or tribe to the cosmos, which is considered integral to individual or group survival (Mazzola 1988). This cosmic meaning is attached to the place of origin for all life, also known as the *Center Place*. Medicine wheels may also be markers of vision quest locations (Hall 1985). For the Blackfeet, medicine wheels were monuments or burial covers for warriors with exceptional abilities (Dempsey 1956). These rock features may signify an abstract representation of the turtle, sacred life-giver to the Arapahos (Wind River Reservation n.d.). Cheyenne informant Elk River explained the Big Horn Medicine Wheel as representing a "medicine lodge," with the outer circles symbolizing the edge of the lodge and rafters, and the central cairn depicting the center pole (Grinnell 1923). So far, the only recorded documentation of indisputable medicine wheels locates them in Saskatchewan, Montana, Wyoming, and a solitary feature at Fort Hood, Texas (Burney 1994:45).

Other rock alignments such as stone enclosures, fence sites, and more obscure formations may have had practical uses or functioned in a sacred manner, but the cultural significance is yet to be determined. Other sacred sites include those locations used for vision quests (e.g., Old Man Mountain in Estes Park), sweat baths (remains of a sweat lodge were found at the base of Arkansas Mountain west of Boulder), sources of unusual clays or clay-pigments (e.g., blue paint-clay source on the Blue River near Kremmling), sites of important battles (even sites, such as the Sand Creek Massacre in 1864, the exact location of which has been debated), places described in oral traditions as the origin place, Sun Dance arbors, and anthropomorphic and zoomorphic rock formations in the landscape (Burney and Lovejoy 1994:214-220). Cold and hot springs are particularly sacred features, sometimes signifying an emergence place or origin place. The hot springs in Idaho Springs are considered sacred, along with many other hot springs in Colorado, such as Hot Sulfur Springs near Kremmling and Manitou Springs (Burney and Lovejoy 1994:218).

CONCLUSIONS

This chapter summarizes historic preservation legislation, the newly mandated consultation process with affiliated tribes, and other areas of concern to Native American groups surrounding archaeological investigations. The NPS has taken a proactive role in disseminating information on the consultation process (McGuire 1997:78), along with in-depth explanations of the historic preservation laws with which archaeologists must comply; thus, archaeologists should refer to the multiple publications produced by the NPS. The OAHP has reference lists for affiliated tribal contacts, in addition to copies of the various legislative acts mentioned in this chapter, in their entirety. Archaeologists can begin with this frequently updated resource in implementation of the consultation process mandated by NAGPRA and amendments to the NHPA.

The consultations mandated by NAGPRA and the 1992 amendments to the NHPA should not be viewed as counterproductive to archaeological inquiry, but as a much-needed impetus to meeting informational needs about the past on the part of specific Native American groups and the general public. One thing is certain: both archaeologists and Native Americans are interested in preservation of cultural remains and a knowledge of past lifeways (Kluth and Munnell 1997:117; McGuire 1997:82). More than anything, the passing of NAGPRA has forced archaeologists to recognize that multiple constituencies exist, and that their respective needs should be acknowledged.

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APPENDIX A.

RADIOCARBON DATES

Table A-1. Paleoindian Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LO19	Drier	Not listed	SI-4898 Cassells 1983	8910 ± 90	8084-7844 B.C. (10034-9794) 7824-7701 B.C. (9774-9651)
5LR13	Lindenmeier	Charcoal	I-141 Haynes and Agogino 1960	10780 ± 135	11033-10450 B.C. (12983-12400)
5LR13	Lindenmeier	Charcoal	GX-1282 Wilmsen and Roberts 1978	11200 ± 400	12070-10335 B.C. (14020-12285)
5LR13	Lindenmeier	Not listed	Not listed Wilmsen and Roberts 1978	5020 ± 300	4460-3036 B.C. (6410-4986)
5LR13	Lindenmeier	Not listed	Not listed Wilmsen and Roberts 1978	5020 ± 300	4460-3036 B.C. (6410-4986)
5LR13	Lindenmeier	Hearth	Beta-42999 Anderson 1992	5280 ± 80	4328-4273 B.C. (6278-6223) 4268-3953 B.C. (6218-5903)
5LR13	Lindenmeier	Charcoal	GX-1283 Wilmsen and Roberts 1978	8400 ± 500	8424-6187 B.C. (10374-8137)
5LR13	Lindenmeier	Bone	Not listed Wilmsen and Roberts 1978	960 ± 180	AD 680-1328 (1270-622) A.D. 1332-1396 (618-554)
5WL53	Jurgens	Charcoal	SI-3726 Wheat 1979 (cited in Butler 1980)	9070 ± 90	8336-8305 B.C. (10286-10255) 8264-7950 B.C. (10214-9900)

Table A-1. Paleoindian Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL268		Humic acid	SMU 31 and 32 Wheat 1979 (cited in Butler 1980)	9600 ± 130	9051-8387 B.C. (11001-10337) 8375-8352 B.C. (10325-10302)
5WL269	Dent	Mammoth bone	I-622 Haynes 1964 (cited in Scott 1981)	11200 ± 500	12317-9996 B.C. (14267-11946)
5WL269	Dent	Mammoth bone	I-473 Haynes 1964 (cited in Scott 1981)	7200 ± 200	6419-5633 B.C. (8369-7583)
5YM8	Jones-Miller	Not listed	SI-1989 Cassells 1983	10020 ± 320	10653-8411 B.C. (12603-10361)
5WN26	Nelson	Not listed	SI-4898 Cassells 1983	7995 ± 80	7194-7186 B.C. (9144-9136) 7136-7125 B.C. (9086-9075) 7049-6602 B.C. (8999-8552)

*Stuiver, M. and P.J. Reimer (1993a, 1993b)

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH6	Witkin Burial	Bone Burial	GX-725 Swedlund and Goodman 1966	3190 ± 80	1627 (1436) 1264 B.C.
5AH132		Charcoal Hearth	DIC-1757 CDOT Files 1980	2400 ± 60	766 (407) 376 B.C.
5AH378		Charcoal Hearth Locus B	Beta-17625 O'Neil and Tate 1986	1870 ± 80	32 B.C. (A.D. 135) 375
5AH416	Meg Site	Charcoal Feature 5B	Beta-89222 Kalasz et al. 1996	1860 ± 70	A.D. 11 (141) 342
5AH416	Meg Site	Charcoal Feature 2	Beta-89218 Kalasz et al. 1996	1920 ± 90	103 B.C. (A.D. 84) 330
5AH416	Meg Site	Charcoal T.P. 1-F.S.24	Beta-89223 Kalasz et al. 1996	1960 ± 00	190 B.C. (A.D. 66) 320
5AH741		Charcoal Feature 9	Beta-93424 Graham 1998	1740 ± 60	A.D. 139 (264, 281, 329) 428
5AH741		Charcoal Hearth Feature 7	Beta-93421 Graham 1998	1780 ± 60	A.D. 118 (349) 413
5AH741		Charcoal Hearth Feature 8	Beta-93422 Graham 1998	3620 ± 70	2180 (1957) 1754 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH741		Charcoal Level 9	Beta-93423 Graham 1998	4080 ± 60	2874 (2586) 2463 B.C.
5AH741		Charcoal Hearth Feature 2	Beta-87270 Graham 1996, 1998	4330 ± 110	3340 (2915) 2618 B.C.
5AH747		Charcoal Hearth Feature 1	Beta-86412 Graham 1996	4260 ± 60	3017 (2886) 2628 B.C.
5BL67	Hungry Whistler	Charcoal Hearth, Unit 2	I-9777 Benedict and Olson 1978	4010 ± 90	2871 (2553, 2543, 2493) 2210 B.C.
5BL67	Hungry Whistler	Charcoal Unit 2	I-9434 Benedict and Olson 1978	5220 ± 190	4456 (4030, 3994) 3641 B.C.
5BL67	Hungry Whistler	Charcoal Unit 2	I-4418 Benedict and Olson 1978	5300 ± 130	4434 (4216, 4201, 4141, 4120, 4086) 3799 B.C.
5BL67	Hungry Whistler	Charcoal Unit 2	I-9434 Benedict and Olson 1978	5520 ± 190	4784 (4351) 3961 B.C.
5BL67	Hungry Whistler	Charcoal Unit 5	I-3817 Benedict and Olson 1978	5730 ± 130	4902 (4545) 4336 B.C.
5BL67	Hungry Whistler	Charcoal Unit 2	I-3267 Benedict and Olson 1978	5800 ± 125	4938 (4686) 4360 B.C.
5BL70		Charcoal Base, Hearth Feature B	I-4419 Benedict and Olson 1978	5350 ± 130	4458 (4226, 4178, 4166) 3823 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL70		Charcoal Base, Hearth Feature A	I-3023 Benedict and Olson 1978	5650 ± 145	4809 (4466) 4170 B.C.
5BL73	Albion Boarding House	Not Listed	I-4582 Benedict 1975	2420 ± 220	1004 (413B.C.), A.D. 53
5BL73	Albion Boarding House	Charcoal	I-5020 Benedict 1975	5730 ± 145	4917 (4545) 4266 B.C.
5BL94	Coney Lake	Charcoal Feature G	I-6775 Benedict 1990	1805 ± 90	A.D. 22(237) 426
5BL94	Coney Lake	Charcoal Feature A	I-15134 Benedict 1990	3660 ± 130	2455 (1026, 1997, 1985) 1683 B.C.
5BL94	Coney Lake	Charred Twig Feature H	Beta-23738 Benedict 1990	5710 ± 115	4809 (4535) 4339 B.C.
5BL103	Devils Thumb Pass Game Drive	Charcoal Blind 1	Beta-111215 Benedict 1998	4100 ± 50	2874 (2615) 2483 B.C.
5BL120	4th of July Valley	Charcoal Hearth	I-6544 Benedict and Olson 1978; Benedict 1981	5880 ± 120	5052 (4775) 4464 B.C.
5BL120	4th of July Valley	Charcoal	I-6545 Benedict 1981	6045 ± 120	5251 (4936) 4688 B.C.
5BL141	Blue Lake Valley	Charcoal	I-8281 Benedict 1979b	3215 ± 90	1682 (1499, 1481, 1456) 1266 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL147		Charcoal Blind 71	I-5709 Olson unpublished	2785 ± 90	1193 (913) 798 B.C.
5BL147		Charcoal	I-3856 Olson unpublished	3275 ± 120	1974 (1521) 1266 B.C.
5BL170	Ptarmigan	Charcoal Feature II	I-8562 Benedict 1981	4620 ± 95	3634 (3363) 3039 B.C.
5BL170	Ptarmigan	Charcoal Feature III	I-8563 Benedict 1981	4700 ± 95	3664 (3503, 3416, 3383) 3110 B.C.
5BL170	Ptarmigan	Redeposited Charcoal	I-8280 Benedict 1981	4745 ± 95	3641 (3515, 3596, 3522) 3372 B.C.
5BL170	Ptarmigan	Charcoal Feature 1	I-10976 Benedict 1981	6205 ± 170	5443 (5208, 5140, 5103, 5088) 4728 B.C.
5BL170	Ptarmigan	Charcoal Feature 1	I-7458 Benedict 1981	6450 ± 110	5575 (5420, 5402, 5379, 5356, 5345) 5146 B.C.
5BL2431		Charcoal	Grant 1990	2610 ± 70	898 (799) 532 B.C.
5BL2712	Rock Creek	Charcoal Feature 22	Beta-68172 Gleichman et al. 1995	3000 ± 190	1677 (1256, 1238, 1220) 802 B.C.
5BL2712	Rock Creek	Charcoal Feature 20	Beta-71550 Gleichman et al. 1995	3120 ± 190	2869 (1401) 848 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL2712	Rock Creek	Charcoal Feature 13	Beta-75345 Gleichman et al. 1995	5010 ± 230	4337 (3787) 3339 B.C.
5BL2712	Rock Creek	Charcoal Feature 34	TX-8922 Gleichman and Karhu 1997	5690 ± 64	4712 (4518) 4363 B.C.
5BL2712	Rock Creek	Charcoal Feature 12	Beta-58396 Gleichman et al. 1995	6240 ± 190	5563 (5220, 5151, 5149) 4726 B.C.
5BL3440		Charcoal Blind 5	Beta-96541 Benedict 1998	1850 ± 50	A.D. 71 (146, 190) 326
5BL3440		Charcoal Blind 3	Beta-57992 Benedict 1998	2155 ± 55	B.C. 371 (185) 38
5BL3440		Charred twig Hearth, Grid B-6	Beta-74907 Benedict 1998	2160 ± 60	B.C. 377 (189) 35
5BL4838	Button Rock	Charcoal Feature 3	Beta-121877 Grant 1998	3380 ± 120	1962 (1677) 1409 B.C.
5BL4838	Button Rock	Charcoal Feature 2	Beta-121878 Grant 1998	3450 ± 60	1898 (1742) 1611 B.C.
5DA29	Dancing Pants	Charcoal Feature 2	Beta-19841 Liestman and Kranzush 1987	1820 ± 60	A.D. 75 (230) 383
5DA29	Dancing Pants	Charcoal Hearth Feature 1	Beta-18396 Liestman and Kranzush 1987	1960 ± 60	59 B.C. (A.D. 66) 217

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA29	Dancing Pants	Charcoal Hearth Feature 22	Beta-19844 Liestman and Kranzush 1987	1980 ± 100	196 B.C. (A.D. 26, 42, 53) 310
5DA29	Dancing Pants	Charcoal Feature 9	PITT-53 Liestman and Kranzush 1987	2820 ± 190	1443 (976, 965, 935) 427 B.C.
5DA29	Dancing Pants	Charcoal over Feature 9 (post mold)	Beta-19851 Liestman and Kranzush 1987	2910 ± 80	1376 (1112, 1101, 1064) 864 B.C.
5DA29	Dancing Pants	Charcoal Hearth Feature 12	Beta-18402 Liestman and Kranzush 1987	3260 ± 100	1746 (1518) 1312 B.C.
5DA29	Dancing Pants	Charcoal Hearth Feature 17	Beta-19848 Liestman and Kranzush 1987	3320 ± 880	1851 (1605, 1557, 1541) 1418 B.C.
5DA29	Dancing Pants	Charcoal Feature 24	Beta-19847 Liestman and Kranzush 1987	3560 ± 110	2194 (1887) 1618 B.C.
5DA29	Dancing Pants	Charcoal Feature 10	Beta-18619 Liestman and Kranzush 1987	3660 ± 140	2429 (2026, 1997, 1985) 1677 B.C.
5DA29	Dancing Pants	Charcoal, Hearth Feature 16 (upper)	Beta-19846 Liestman and Kranzush 1987	3820 ± 130	2587 (2277, 2207) 1887 B.C.
5DA29	Dancing Pants	Charcoal Feature 25	Beta-19850 Liestman and Kranzush 1987	4180 ± 120	3037 (2868, 2805, 2770, 2719, 2703) 2459 B.C.
5DA29	Dancing Pants	Charcoal Hearth Feature 26	Beta-19852 Liestman and Kranzush 1987	4610 ± 90	3629 (3360) 3039 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA29	Dancing Pants	Charcoal Hearth Feature 19	Beta-18620 Liestman and Kranzush 1987	4670 ± 120	3696 (3496, 3461, 3377) 3039 B.C.
5DA29	Dancing Pants	Charcoal Hearth Feature 16 (lower)	Beta-19845 Liestman and Kranzush 1987	4720 ± 100	3699 (3508, 3400, 3387) 3123 B.C.
5DA119	Roxborough Park #1, Geologic Locality 126	Charcoal	W-272 Rubin and Suess 1956; Scott 1963	5780 ± 160	4994 (4675, 4641, 4617) 4333 B.C.
5DA120	Spring Site	Twigs	W-288 Rubin and Suess 1956	4885 ± 160	3988 (3659) 3344 B.C.
5DA265	Bayou Gulch	Charcoal	DIC-1464 Butler 1981; Gilmore 1991	2680 ± 145	1197 (818) 405 B.C.
5DA265	Bayou Gulch	Charcoal Hearth Feature 14	DIC-1508 Butler 1981	3410 ± 70	1885 (1731, 1728, 1686) 1520 B.C.
5DA306	Window Rock	Charcoal Hearth Feature 3	Beta-28588 OAHP Site Files	1970 ± 50	50 B.C. (A.D. 59) 136
5DV3017	Box Elder-Tate	Hearth Feature P	Beta-50133 Tucker et al. 1992	3520 ± 130	2194 (1875, 1836, 1818, 1800, 1785) 1517 B.C.
5DV3041	Monaghan Camp	Hearth Feature A	Beta-34747 Tucker 1990	3690 ± 130	2462 (2112, 2089, 2038) 1699 B.C.
5DV3041	Monaghan Camp	Hearth Feature C	Beta-34748 Tucker 1990	4920 ± 210	4224 (3698) 3107 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF6	Willowbrook; aka L.B. Shelter	Charcoal	GX-528 Leach 1966	2040 ± 100	362 (36B.C.) A.D. 216
5JF6	Willowbrook	Charcoal	GX-527 Leach 1966	2215 ± 75	400 (351, 312, 206) 47 B.C.
5JF10	Van Bibber Creek	Charcoal, Zone C	I-3818 Nelson 1969	2140 ± 145	480 (173 B.C.) A.D. 196
5JF51	Bradford House II	Charcoal Hearth	UGA-4000 Richardson 1974; Johnson et al. 1997	3255 ± 765	3627 (1517B.C.) A.D. 338
5JF52	Bradford House III	Charcoal Hearth Feature 13	UGA-2615 Johnson et al. 1997	1895 ± 55	A.D. 8 (122) 247
5JF52	Bradford House III	Bone Burial Feature 11	UGA-993 Finnegan 1978	2440 ± 185	928 (511, 435, 428) 49 B.C.
5JF52	Bradford House III	Charcoal Feature 17	UGA-2613 Johnson et al. 1997	2725 ± 60	997 (840) 797 B.C.
5JF52	Bradford House III	Charcoal Grid D-7, 92-96 inches	Beta-12200 Johnson et al. 1997	3240 ± 70	1678 (1513) 1328 B.C.
5JF52	Bradford House III	Charcoal Feature 23, 92-96 inches	UGA-4001 Johnson et al. 1997	3810 ± 140	2612 (2272, 2258, 2204) 1789 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF52	Bradford House III	Charcoal Feature 23, 104 inches	UGA-2616 Johnson et al. 1997	4900 ± 105	3950 (3692, 3670) 3380 B.C.
5JF63	Cherry Gulch	Bone	UGA-1069 Nelson 1981	3460 ± 75	1945 (1745) 1529 B.C.
5JF63	Cherry Gulch	Charcoal Grid Q 72-85 inches	UGA-1230 Nelson 1981	5730 ± 220	5193 (4545) 4048 B.C.
5JF142	LoDaisKa	Charcoal	M-1006 Irwin and Irwin 1961	3150 ± 200	1885 (1414) 868 B.C.
5JF142	LoDaisKa	Charcoal	M-1004 Irwin and Irwin 1961	3400 ± 200	2200 (1683) 1219 B.C.
5JF142	LoDaisKa	Charcoal	M-1009 Irwin and Irwin 1961	4840 ± 250	4224 (3642) 2917 B.C.
5JF148	Crescent	Bone Burial	UCR-1298 Finnegan and Kilgore 1997	5155 ± 110	4235 (3967) 3703 B.C.
5JF148	Crescent	Charcoal Grid D9, Level 19	UCR-1300 Ford 1983; Johnson et al. 1997	5680 ± 110	4784 (4507) 4333 B.C.
5JF148	Crescent	Charcoal Trench	UCR-1305 Ford 1983; Johnson et al. 1997	6200 ± 240	5577 (5206, 5171, 5138, 5112, 5086) 4540 B.C.
5JF211	Falcons Nest	Charcoal Burial in Midden	UGA-1621 Adkins 1993	1990 ± 240	753 B.C. (A.D. 19) 591

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF211	Falcons Nest	Charcoal	Beta-17605 Adkins 1993	2760 ± 110	1251 (902) 770 B.C.
5JF223	Magic Mountain	Charcoal, base of Feature 11B	Beta-94377 Kalasz et al. 1997	1760 ± 50	A.D. 139 (256, 296, 319) 413
5JF223	Magic Mountain	Charcoal Feature 1	Beta-77135 Kalasz et al. 1997	1790 ± 60	A.D. 87 (244) 408
5JF223	Magic Mountain	Charcoal, base of Feature 11	Beta-94379	1930 ± 70	50 B.C. (A.D. 80) 245
5JF223	Magic Mountain	Soil Zone C, Level 17-18	Beta-94381 Kalasz and Shields 1997	2890 ± 70	1265 (1034) 863 B.C.
5JF223	Magic Mountain	Soil Zone D, Level 19-20	Beta-94382 Kalasz et al.1997	3220 ± 90	1684 (1504, 1477, 1462) 1267 B.C.
5JF223	Magic Mountain	Carbonized Branch, Unit 6 between Zones E and F	W8/70-71 Irwin and Irwin1961	4900 ± 250	4311 (3692, 3670) 2930 B.C.
5JF321	Swallow	Charcoal	Beta-45147 Rathbun 1991	1880 ± 90	45 B.C. (A.D. 130) 244
5JF321	Swallow	Charcoal	Beta-55584 Rathbun 1993	2390 ± 70	769 (405) 263 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF321	Swallow	Charcoal Feature 107	Beta-42288 Rathbun 1991	3150 ± 100	1626 (1414) 1129 B.C.
5JF321	Swallow	Charcoal	Beta-44398 Rathbun 1991	3440 ± 90	1964 (1740) 1517 B.C.
5JF321	Swallow	Charcoal Grid C1N	Beta-81295 Rathbun 1996	7170 ± 60	6121 (5986) 5876 B.C.
5JF339	Massey Draw	Soil Camp Level F	Beta-12801 Anderson et al. 1994	1960 ± 80	158 B.C. (A.D. 66) 240
5JF339	Massey Draw	Camp Level D	Beta-14914 Anderson et al. 1994	2420 ± 160	893(413) 101 B.C.
5JF339	Massey Draw	Bone Level VI	Beta-12215 Anderson et al. 1994	2470 ± 190	999 (753, 699, 533) 67 B.C.
5JF339	Massey Draw	Bone Level IV	Beta-12276 Anderson et al. 1994	2670 ± 160	1254 (814) 397 B.C.
5JF339	Massey Draw	Camp Level C	Beta-12011 Anderson et al. 1994	2930 ± 60	1310 (1120) 926 B.C.
5JF339	Massey Draw	Camp Level B	Beta-12803 Anderson et al. 1994	6150 ± 150	5421 (5064) 4722 B.C.
5JF339	Massey Draw	Camp Level B	Beta-12800 Anderson et al. 1994	6440 ± 110	5573 (5415, 5406, 5376, 5361, 5340) 5143 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF367		Charcoal	Beta-15091 Angulski 1986	2380 ± 50	756 (403) 376 B.C.
5JF463	Dutch Creek	Charcoal Feature 1	Beta-21192 Jepson and Hand 1994	1980 ± 50	60 B.C. (A.D. 26, 42, 53) 131
5JF463	Dutch Creek	Charcoal Feature 7	Beta-57959 Jepson and Hand 1994	2100 ± 60	354 (102 B.C.) A.D. 54
5JF463	Dutch Creek	Charcoal Feature 2	Beta-22217 Jepson and Hand 1994	2700 ± 90	1024 (8270) 610 B.C.
5JF463	Dutch Creek	Core 7-2	Beta-13325 Jepson and Hand 1994	2830 ± 70	1198 (987, 956, 944) 822 B.C.
5JF463	Dutch Creek	Core 7-1	Beta-13324 Jepson and Hand 1994	3260 ± 80	1734 (1518) 1328 B.C.
5JF463	Dutch Creek	Charcoal Feature 5	Beta-57957 Jepson and Hand 1994	4210 ± 100	3033 (2875, 2794, 2784) 2492 BC.
5JF463	Dutch Creek	Charcoal Feature 6	Beta-57958 Jepson and Hand 1994	4210 ± 80	3010 (2875, 2794, 2784) 2507 B.C.
5LO101	Dipper Gap	Charcoal Feature 1	UGA-456 Metcalf 1974	3180 ± 90	1672 (1429) 1219 B.C.
5LO101	Dipper Gap	Charcoal Feature 5	UGA-453 Metcalf 1974	3410 ± 90	1928 (1731, 1728, 1686) 1510 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LO101	Dipper Gap	Charcoal Feature 10	UGA-455 Metcalf 1974	3520 ± 85	2113 (1875, 1836, 1818, 1800, 1785) 1624 B.C.
5LO122	Merino site	Charcoal Disturbed Hearth	UGA-661 Morris and Kainer 1975	2945 ± 1475	4781 (1127 B.C.) A.D. 1955
5LR6	Flattop Mountain Game Drive	Charcoal Blind 46	Beta-79744 Benedict 1996	2620 ± 60	894 (801) 557 B.C.
5LR6	Flattop Mountain Game Drive	Charcoal Blind 54	Beta-79746 Benedict 1996	4310 ± 80	3255 (2911) 2669 B.C.
5LR13	Lindenmeier Site	Charcoal	Wilmsen and Roberts 1984; Anderson 1992	5020 ± 300	4460 (3792) 3036 B.C.
5LR13	Lindenmeier Site	Charcoal Hearth	Beta-42999 Anderson 1992	5280 ± 80	4328 (4212, 4208, 4131, 4130, 4078, 4059, 4046) 3953 B.C.
5LR15	Trail Ridge Game Drive	Charcoal Blind 3	Beta-75998 Benedict 1996	2610 ± 60	844 (799) 546 B.C.
5LR15	Trail Ridge Game Drive	Charcoal Blind 5	Beta-85363 Benedict 1996	4590 ± 60	3506 (3353) 3096 B.C.
5LR42	Carter Lake Burial	Charcoal Midden	Beta-59298 Gleichman and Mutaw 1994	1850 ± 90	32 B.C. (A.D.146, 190) 407
5LR60	Flattop Mountain Game Drive	Charcoal Blind 46	Beta-79744 Benedict 1996	2620 ± 60	894 (801) 557 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR60	Flattop Mountain Game Drive	Charcoal Blind 54	Beta-79746 Benedict 1996	4310 ± 80	3255 (2911) 2669 B.C.
5LR144	Kinney Spring	Charcoal Site C, Level 26	Beta-7330 Morris et al. 1985	3110 ± 130	1674 (1396) 999 B.C.
5LR144	Kinney Spring	Charcoal Site C, Bank	Beta-6847 Morris et al. 1985	3250 ± 80	1731 (1516) 1324 B.C.
5LR144	Kinney Spring	Charcoal Site C, L.87-97R.24F.9	Beta-7333 Morris et al. 1985	3800 ± 70	2460 (2200) 1984 B.C.
5LR144	Kinney Spring	Charcoal Site C	Beta-6846 Morris et al. 1984	3950 ± 150	2884 (2461) 1980 B.C.
5LR144	Kinney Spring	Charcoal Site C	Beta-7332 Morris et al. 1984	5410 ± 70	4361 (4315, 4298, 4254) 4043 B.C.
5LR161	Phoebe Rockshelter	Charcoal	Beta-3869 Thompson 1986	3570 ± 60	2114 (1892) 1742 B.C.
5LR161	Phoebe Rockshelter	Charcoal	Beta-3870 Thompson 1986	3890 ± 60	2554 (2397, 2379, 2348) 2145 B.C.
5LR161	Phoebe Rockshelter	Charcoal	Beta-3871 Thompson 1986	4810 ± 120	3906 (3634) 3346 B.C.
5LR170	Pack Rat Shelter	Feature 56	Beta-2285 Morris et al. 1985	2440 ± 80	797 (511, 435, 428) 376 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR170	Pack Rat Shelter	Feature 57	Beta-2288 Morris et al. 1985	2480 ± 90	810 (755, 686, 540) 384 B.C.
5LR170	Pack Rat Shelter	Feature 51	Beta-2286 Morris et al. 1985	2760 ± 70	1046 (902) 801 B.C.
5LR252	Spring Gulch	Charcoal Level IV, Loc. 1	UGA-669 Kainer 1976	2340 ± 85	764 (395) 192 B.C.
5LR252	Spring Gulch	Charcoal Level IV, Loc. 1	UGA-829 Kainer 1976	2415 ± 85	794 (410) 260 B.C.
5LR252	Spring Gulch	Charcoal Level IV, Loc. 1	UGA-671 Kainer 1976	2830 ± 135	1392 (987, 956, 944) 784 B.C.
5LR252	Spring Gulch	Charcoal Level IV, Loc. 1	UGA-672 Kainer 1976	3095 ± 75	1515 (1389, 1334, 1327) 1126 B.C.
5LR252	Spring Gulch	Charcoal Level V, Loc. 1	UGA-1047 Kainer 1976	3700 ± 105	2453 (2120, 2084, 2042) 1771 B.C.
5LR252	Spring Gulch	Charcoal Level IV, Loc. 1	UGA-1048 Kainer 1976	3855 ± 350	3341 (2303) 1417 B.C.
5LR284	Lightning Hill	Charcoal	UGA-1388 Morris and Marcotte 1977	5390 ± 165	4541 (4243) 3808 B.C.
5LR288	Lunch Cave	Charcoal Feature 2	UGA-1864 Morris, personal comm.	3085 ± 60	2492 (1384, 1340, 1323) 1135 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR220 (a.k.a. 5LR450)	Joe Wright Site	Charcoal Hearth	UGA-1467 Morris and Marcotte 1976; Morris personal comm.	2000 ± 60	158 B.C. (A.D. 12) 130
5LR549		Charcoal Hearth	UGA-2064 Gordon and Kranzush 1978	2040 ± 85	348 (36 B.C.) A.D. 136
5LR1370	Bodes Draw	Charcoal Feature 2, Area B	I-15952 Benedict 1993	2270 ± 80	481 (372) 112 B.C.
5PA153		Charcoal Level 4	UGA-3881 Schubert et al. 1981	1760 ± 150	45 B.C. (A.D. 256, 296, 319) 620
5PA153		Charcoal Test Trench 1 Level 8	UGA-3888 Schubert et al. 1981	3200 ± 655	3303 (1443 B.C.) A.D.125
5PA415		Charcoal Hearth	Beta-13327 Gooding 1986	2920 ± 90	1393 (1116) 847 B.C.
5WL32	Uhl Site	Charcoal Feature 9 Zone E	GX-320 Wood 1967	1955 ± 95	178 B.C. (A.D. 69) 317
5WL32	Uhl Site	Charcoal Zone E	GX-323 Wood 1967	2010 ± 65	174 B.C. (A.D. 5) 130
5WL32	Uhl Site	Mammal Bone Redeposited	GX-322 Wood 1967	2095 ± 105	387 (96 B.C.) A.D. 128
5WL32	Uhl Site	Charcoal Feature 4 Zone E	GX-321 Wood 1967	2170 ± 160	758 (193 B.C.) A.D. 196

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL48		Charcoal Hearth Feature 17	Beta-48813 Jepson et al. 1994; McFaul et al. 1994	2290 ± 50	405 (381) 198 B.C.
5WL48		Charcoal Hearth Feature 10	Beta-48811 Jepson et al. 1994; McFaul et al. 1994	2810 ± 80	1198 (927) 807 B.C.
5WL48		Charcoal Hearth Feature 15	Beta-48812 Jepson et al. 1994; McFaul et al. 1994	2830 ± 80	1254 (987, 956, 944) 813 B.C.
5WL48		Charcoal Hearth Feature 12	Beta-48810 Jepson et al. 1994; McFaul et al. 1994	3230 ± 80	1681 (1511) 1315 B.C.
5WL101	Happy Hollow Rockshelter	Charcoal Hearth Feature 6	GAK-1302 Steege 1967	2170 ± 80	394 (193 B.C.) A.D. 6
5WL101	Happy Hollow Rockshelter	Charcoal Hearth Feature 7	GAK-844 Steege 1967	2680 ± 90	1005 (818) 558 B.C.
5WL1555		Charcoal Hearth	Beta-48814 Jepson et al. 1994; McFaul et al. 1994	2070 ± 100	373 (50 B.C.) A.D. 136
5WL1555		Charcoal Hearth	Beta-48815 Jepson et al. 1994; McFaul et al. 1994	2890 ± 80	1309 (1034) 842 B.C.

Table A-2. Archaic Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL1656	Willow Bunker	Charcoal Hearth	Beta-108068 Overturf and Feiler 1998	6910 ± 50	5850 (5724) 5638 B.C.
5WL1794		Charcoal Feature 8	Beta-59656 Painter et al. 1995	2970 ± 90	1415 (1196, 1181, 1165, 1141, 1139) 915 B.C.
5WL1856	Rattlesnake Shelter	Charcoal Hearth Feature 3 Unit 3	Beta-66569 Brunswig 1996	1920 ± 80	59 B.C. (A.D. 84) 320
5WL1856	Rattlesnake Shelter	Humic Soil or Charcoal Unit 3	Beta-66570 Brunswig 1996	2600 ± 100	923 (797) 407 B.C.
5WL1856	Rattlesnake Shelter	Humic Soil or Charcoal Unit 3	Beta-74321 Brunswig 1996	2680 ± 60	923 (818) 783 B.C.
5WL1856	Rattlesnake Shelter	Humic Soil or Charcoal Unit 3	Beta-82987 Brunswig 1996	2760 ± 80	1117 (902) 796 B.C.
5WL1856	Rattlesnake Shelter	Humic Soil or Charcoal Unit 3	Beta-74320 Brunswig 1996	3350 ± 70	1861 (1625) 1449 B.C.
5WL2055	Webster Feedlot Burial, aka Weld Burial	Bone	Beta-39363 Wanner and Brunswig 1992	2080 ± 160	407 (58 B.C.) A.D. 319
5YM112	Hutton-Pinkham Site	Charcoal Hearth	Beta-35336 Larson et al. 1992	4310 ± 200	3506 (2911) 2405 B.C.

*Stuiver, M. and P.J. Reimer (1993a, 1993b)

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH2	Michaud A	Burial 1	Wood 1967	1800 ± 10	2 B.C. (A.D. 239) 532
5AH15		Feature 1	Beta-34744 Gilmore 1991a	470 ± 70	A.D. 1321 (1438) 1631
5AH244	Aurora Burial	Charcoal, Burial 2	Beta-4732 Guthrie 1983	1040 ± 50	A.D. 893 (1011) 1153
5AH244	Aurora Burial	Human Bone, Burial 2	Beta-4733 Guthrie 1983	1230 ± 80	A.D. 656 (786)9902
5AH244	Aurora Burial	Charcoal, Burial 1	Beta-4730 Guthrie 1983	1570 ± 95	A.D. 256 (535) 660
5AH366		Test Pit 1, Feature 1	Beta-17623 O'Neil and Tate 1986	1160 ± 80	A.D. 679 (888) 1023
5AH366		Test Pit 1, Feature 1	Beta-17624 O'Neil and Tate 1986	1200 ± 70	A.D. 670 (872) 998

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH378		Location B Hearth	Beta-17625 O'Neil and Tate 1986	1870 ± 80	32 B.C. (A.D. 135) 375
5AH380	Senac Site	Feature 24 Level 12/13	Beta-22854 O'Neil et al. 1988	1030 ± 130	A.D. 710 (1014) 1278
5AH380	Senac Site	Test Pit 6	Beta-17626 O'Neil et al. 1986	1060 ± 80	A.D. 789 (997) 1165
5AH380	Senac Site	Feature 9	Beta-22851 O'Neil et al. 1988	1070 ± 100	A.D. 727 (989) 1201
5AH380	Senac Site	Level 13	Beta-22855 O'Neil et al. 1988	1190 ± 100	A.D. 656 (881) 1026
5AH380	Senac Site	Feature 2	Beta-22849 O'Neil et al. 1988	1200 ± 60	A.D. 679 (872) 985
5AH380	Senac Site	Level 19/20	Beta-22865 O'Neil et al. 1988	1330 ± 70	A.D. 608 (676) 881
5AH380	Senac Site	Feature 12	Beta-22852 O'Neil et al. 1988	1380 ± 90	A.D. 537 (660) 873
5AH380	Senac Site	Feature 13	Beta-22853 O'Neil et al. 1988	1560 ± 80	A.D. 339 (538) 654

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH380	Senac Site	Feature 2	Beta-22850 O'Neil et al. 1988	1620 ± 60	A.D. 263 (427) 597
5AH416	Meg Site	Feature 4	Beta-89220 Kalasz et al. 1996	890 ± 50	A.D. 1025 (1168) 1276
5AH416	Meg Site	Feature 1	Beta-89217 Kalasz et al. 1996	1460 ± 60	A.D. 450 (619) 673
5AH416	Meg Site	Test Pit 3	Beta-89224 Kalasz et al. 1996	1590 ± 80	A.D. 260 (445) 642
5AH416	Meg Site	Feature 5A	Beta-89221 Kalasz et al. 1996	1610 ± 80	A.D. 252 (432) 630
5AH416	Meg Site	Feature 3	Beta-89219 Kalasz et al. 1996	1710 ± 70	A.D. 145 (347, 360, 374) 535
5AH416	Meg Site	Feature 5B	Beta-17625 Kalasz et al. 1996	1860 ± 70	A.D. 11 (141) 342
5AH416	Meg Site	Feature 2	Beta-89218 Kalasz et al. 1996	1920 ± 90	103 B.C. (A.D. 84) 330
5AH416	Meg Site	Test Pit 1	Beta-89223 Kalasz et al. 1996	1960 ± 100	190 B.C. (A.D. 66) 320

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5AH741		Feature 9	Beta-93424 Graham 1998	1740 ± 60	A.D. 139 (264,281,329) 428
5AH741		Feature 7	Beta-93421 Graham 1998	1780 ± 60	A.D. 118 (249) 413
5AM3	Hazeltine Heights	Burial 6	I-885 Buckles et al. 1963	1305 ± 100	A.D. 566 (687) 971
5AM631	Moffit Site	Feature L	Beta-67341 Tucker 1994	620 ± 60	A.D. 1283 (1315, 1347, 1390) 1431
5BL65	Murray Game Drive		SI-301 Benedict 1975b	670 ± 150	A.D. 1032 (1300) 1611
5BL65	Murray Game Drive		M1542 Benedict 1975b	970 ± 100	A.D. 885 (1032) 1279
5BL68		Blind 16	SI-302 Benedict 1975c	1230 ± 360	A.D. 71 (786) 1426
5BL68		Blind 15	I-2423 Benedict 1975c	1360 ± 180	A.D. 340 (665) 1023

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL68		Blind 25	I-3264 Benedict unpublished	1730 ± 100	A.D. 79 (268, 274, 334) 548
5BL69	Scratching Deer Site	Feature 1	I-3265 Benedict 1975c	1260 ± 95	A.D. 626 (776) 990
5BL94	Coney Lake Site	Feature F	I-6776 Benedict 1990	1200 ± 90	A.D. 659 (872) 1017
5BL94	Coney Lake Site	Feature D	I-15133 Benedict 1990	1210 ± 80	A.D. 662 (821, 840, 860) 1006
5BL94	Coney Lake Site	Feature B	I-15132 Benedict 1990	1360 ± 80	A.D. 551 (665) 873
5BL94	Coney Lake Site	Feature E	I-12301 Benedict 1990	1430 ± 80	A.D. 444 (641) 772
5BL94	Coney Lake Site	Feature G	I-6774 Benedict 1990	1585 ± 90	A.D. 254 (449, 488, 493) 653
5BL94	Coney Lake Site	Feature C	I-6775 Benedict 1990	1805 ± 90	A.D. 22 (237) 426
5BL97		Blind	I-9004 Benedict 1990	1400 ± 80	A.D. 537 (654) 783

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL876	Indian Mountain Site	Stone Circle 3 hearth	AA-354 Cassells and Farington 1986	1120 ± 200	A.D. 552 (898, 906, 961) 1288
5BL876	Indian Mountain Site	Stone Circle 1 hearth	AA-461 Cassells and Farington 1986	1280 ± 195	A.D. 404 (719, 739, 766) 1168
5BL2712	Rock Creek Site	50s/10w SE 1/4	Beta-42955 Gleichman et al. 1995	650 ± 110	A.D. 1191 (1305, 1367, 1373) 1449
5BL2712	Rock Creek Site	50s/10w NW 1/4	Beta-42956 Gleichman et al. 1995	780 ± 90	A.D. 1036 (1275) 1396
5BL2712	Rock Creek Site	Feature 1	Beta-40187 Gleichman et al. 1995	850 ± 70	A.D. 1025 (1218) 1291
5BL2712	Rock Creek Site	Feature 14	Beta-68171 Gleichman et al. 1995	920 ± 60	A.D. 1010 (1064, 1075, 1127, 1133, 1159) 1257
5BL2712	Rock Creek Site	Feature 16	Beta-68169 Gleichman et al. 1995	930 ± 70	A.D. 989 (1052, 1085, 1121, 1139,1156) 1275
5BL2712	Rock Creek Site	Feature 17	Beta-68170 Gleichman et al. 1995	960 ± 70	A.D. 972 (1037) 1230
5BL2712	Rock Creek Site	Feature 7	Beta-40188 Gleichman et al. 1995	970 ± 70	A.D. 966 (1032) 1226

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5BL2712	Rock Creek Site	Feature 11	Beta-71549 Gleichman et al. 1995	1080 ± 70	A.D. 789 (984) 1153
5BL2712	Rock Creek Site	Feature 29	Beta-71551 Gleichman et al. 1995	1100 ± 100	A.D. 689 (973) 1165
5BL3440		Blind 5	Beta-96541 Benedict 1999	1850 ± 50	A.D. 71 (146, 190) 326
5CC389		Test Pit 2	Beta-36598 Hand and Pearce 1990	1600 ± 60	A.D. 339 (439) 607
5CH3	Chubbuck-Oman Burial	Human Bone	GX-726 Tipton 1967	420 ± 80	A.D. 1400 (1454) 1654
5CH3	Chubbuck-Oman Burial	Human Bone - second run	GX-726 Tipton 1967	400 ± 95	A.D. 1398 (1473) 1953
5DA29	Dancing Pants Shelter		Beta-18397 Liestman and Kranzush 1987	570 ± 90	A.D. 1281 (1403) 1478
5DA29	Dancing Pants Shelter	Feature 5	Beta-18398 Liestman and Kranzush 1987	1070 ± 70	A.D. 819 (989) 1156
5DA29	Dancing Pants Shelter	Feature 4	Beta-19842 Liestman and Kranzush 1987	1230 ± 70	A.D. 662 (786) 979

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA29	Dancing Pants Shelter	Feature 8	Beta-18399 Liestman and Kranzush 1987	1480 ± 90	A.D. 411 (605) 693
5DA29	Dancing Pants Shelter	Feature 6	Pitt-54 Liestman and Kranzush 1987	1550 ± 40	A.D. 422 (541) 614
5DA29	Dancing Pants Shelter	Feature 7	Beta-19843 Liestman and Kranzush 1987	1590 ± 60	A.D. 345 (445) 612
5DA29	Dancing Pants Shelter	Feature 8	Beta-18400 Liestman and Kranzush 1987	1740 ± 70	A.D. 129 (264, 281, 329) 440
5DA29	Dancing Pants Shelter	Feature 2	Beta-19841 Liestman and Kranzush 1987	1820 ± 60	A.D. 75 (230) 383
5DA29	Dancing Pants Shelter	Feature 1	Beta-18396 Liestman and Kranzush 1987	1960 ± 60	59 B.C. (A.D. 66) 217
5DA29	Dancing Pants Shelter	Feature 22	Beta-19844 Liestman and Kranzush 1987	1980 ± 100	196 B.C. (A.D. 26, 42, 53) 310
5DA123	Helmer Ranch Site	Charcoal, unknown prov.	W-289 Scott 1963	1490 ± 160	A.D. 234 (600) 886
5DA124	Rainbow Creek Site	Charcoal, ceramic pot fill	W-290 Scott 1963	1360 ± 200	A.D. 256 (665) 1037

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA265	Bayou Gulch Site	Feature 33	DIC-1703 Gilmore 1991b	510 ± 85	2 B.C. (A.D. 239) 532
5DA265	Bayou Gulch Site	Feature 21	DIC-1702 Gilmore 1991b	640 ± 65	A.D. 1321 (1438) 1631
5DA265	Bayou Gulch Site	Feature 20	DIC-1503 Gilmore 1991b	1040 ± 50	A.D. 893 (1011) 1153
5DA265	Bayou Gulch Site	Stratigraphic age	DIC-1465 Gilmore 1991b	1230 ± 80	A.D. 656 (786)9902
5DA265	Bayou Gulch Site	Sample 2 Feature 19	DIC-1701 Gilmore 1991b	1570 ± 95	A.D. 256 (535) 660
5DA265	Bayou Gulch Site	Feature 12	DIC-1507 Gilmore 1991b	1160 ± 80	A.D. 679 (888) 1023
5DA265	Bayou Gulch Site	Sample 1 Feature 19	DIC-1700 Gilmore 1991b	940 ± 50	A.D. 1010 (1046, 1097, 1115, 1144, 1153) 1222
5DA265	Bayou Gulch Site	Feature 1	DIC-1440 Gilmore 1991b	950 ± 60	A.D. 989 (1041, 1150) 1226
5DA265	Bayou Gulch Site	Upper slope	DIC-1438 Gilmore 1991b	1050 ± 55	A.D. 888 (1005) 1153
5DA265	Bayou Gulch Site	Contact between A & B horizons	DIC-1439 Gilmore 1991b	1270 ± 95	A.D. 617 (728, 732. 772) 984

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA265	Bayou Gulch Site	Feature 18	DIC-1700 Gilmore 1991b	1350 ± 65	A.D. 603 (668) 790
5DA265	Bayou Gulch Site	Feature 18b	DIC-1440 Gilmore 1991b	1440 ± 55	A.D. 540 (635) 678
5DA265	Bayou Gulch Site	Feature 10	DIC-1438 Gilmore 1991b	1520 ± 50	A.D. 426 (553) 648
5DA265	Bayou Gulch Site	Feature 5	DIC-1439 Gilmore 1991b	1660 ± 55	A.D. 252 (412)542
5DA269	Kinney Creek	Feature 4	DIC-1699 Gilmore 1989a	620 ± 55	A.D. 1285 (1315, 1347,1390) 1427
5DA272	Franktown Cave	Upper slope	VGA 1682 Pustmueller 1977	890 ± 65	A.D. 1016 (1168) 1281
5DA272	Franktown Cave	80 cm deep Hearth area	VGA 1683 Pustmueller 1977	1755 ± 65	A.D. 126 (258, 292, 321) 426
5DA306	Window Rock	Hearth	Beta-29047 Tate 1979; OAHP files	1460 ± 90	A.D. 419 (619) 767
5DA306	Window Rock	Hearth	Beta-29047 Tate 1979; OAHP files	1970 ± 50	50 B.C. (A.D. 59) 136
5DA450		Hearth	Beta- 16293 Guthrie 1986	870 ± 50	A.D. 1031 (1195) 1297

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DA451		Hearth	Beta-16294 Guthrie 1986	1330 ± 110	A.D. 541 (676) 968
5DA541	Jarre Creek	Hearth	W1018 Scott 1963	900 ± 250	A.D. 654 (1165) 1473
5DA603	Jackson Creek	Charcoal	Beta-3892 Wynn et al. 1985	1230 ± 60	A.D. 667 (786) 968
5DA603	Jackson Creek	Charcoal	Beta-3893 Wynn et al. 1985	1280 ± 60	A.D. 653 (719, 739, 766) 889
5DA603	Jackson Creek	Charcoal	Beta-5775 Wynn et al. 1985	1590 ± 70	A.D. 267 (445) 630
5DA603	Jackson Creek	Charcoal	Beta-5776 Wynn et al. 1985	1680 ± 50	A.D. 248 (397) 532
5DV3017	Box Elder-Tate Hamlet	Feature 1	Beta-50128 Tucker et al. 1992	630 ± 90	A.D. 1238 (1310, 1353, 1385) 1444
5DV3017	Box Elder-Tate Hamlet	Feature O	Beta-50132 Tucker et al. 1992	760 ± 100	A.D. 1036 (1280) 1405
5DV3017	Box Elder-Tate Hamlet	Feature D	Beta-50118 Tucker et al. 1992	910 ± 110	A.D. 895 (1162) 1295

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DV3017	Box Elder-Tate Hamlet	Feature 1 fill	Beta-51397 Tucker et al. 1989	960 ± 60	A.D. 983 (1037) 1222
5DV3017	Box Elder-Tate Hamlet	Feature F, Stratum 1	Beta-50120 Tucker et al. 1992	990 ± 60	A.D. 966 (1025) 1205
5DV3017	Box Elder-Tate Hamlet	Feature N	Beta-50131 Tucker et al. 1992	1080 ± 90	A.D. 775 (984) 1165
5DV3017	Box Elder-Tate Hamlet	Feature 1-C	Beta-50135 Tucker et al. 1992	1080 ± 100	719 (984) 1178
5DV3017	Box Elder-Tate Hamlet	Feature M	Beta-50130 Tucker et al. 1992	1170 ± 60	A.D. 709 (886) 1006
5DV3017	Box Elder-Tate Hamlet	Feature B	Beta-50116 Tucker et al. 1992	1180 ± 100	A.D. 659 (883) 1029
5DV3017	Box Elder-Tate Hamlet	Feature F-3	Beta-50121 Tucker et al. 1992	1290 ± 90	A.D. 711 (711, 746, 755) 968
5DV3017	Box Elder-Tate Hamlet	Feature C	Beta-50117 Tucker et al. 1992	1300 ± 60	A.D. 645 (690) 884
5DV3017	Box Elder-Tate Hamlet	Feature F-4	Beta-50122 Tucker et al. 1992	1330 ± 100	A.D. 547 (676) 956

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5DV3017	Box Elder-Tate Hamlet	Feature F-10	Beta-50124 Tucker et al. 1992	1360 ± 70	A.D. 594 (665) 790
5DV3017	Box Elder-Tate Hamlet	Feature J	Beta-50127 Tucker et al. 1992	1460 ± 120	A.D. 381 (619) 790
5DV3017	Box Elder-Tate Hamlet	Feature G	Beta-50125 Tucker et al. 1992	1610 ± 90	A.D. 243 (432) 642
5JA58	Muad' dib	Hearth	UGA-2212 Gordon and Kranzush 1978c	955 ± 75	A.D. 969 (1039) 1253
5JA58	Muad' dib	Hearth	UGA-1925 Gordon and Kranzush 1978a	1485 ± 220	A.D. 81 (603) 1009
5JA1068		Feature 2	Beta-110839 Hood et al. 1998	1530 ± 100	A.D. 267 (548) 677
5JF6	Willowbrook		GX-526 Leach 1966	1290 ± 100	A.D. 599 (711, 746, 755) 979
5JF8	Graeber Cave	Hearth	I-12530 Nelson and Graeber 1984	630 ± 75	A.D. 1270 (1310, 1353, 1385) 1436
5JF10	Van Bibber Creek	Zone A hearth	W-616 Nelson 1969	1050 ± 250	A.D. 541 (1005) 1408

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF52	Bradford House III	Feature 16	UGA-2612 Johnson and Lyons 1997b	1225 ± 55	A.D. 672 (788) 965
5JF52	Bradford House III	Feature 16 – second run	UGA-2612 Johnson and Lyons 1997	1270 ± 95	A.D. 617 (728, 732, 772) 984
5JF52	Bradford House III	Feature 4	UGA-2614 Johnson (in press)	1520 ± 55	A.D. 422 (553) 652
5JF52	Bradford House III	Feature 13	UGA-2615 Johnson (in press)	1895 ± 55	A.D. 8 (122) 247
5JF142	LoDaisKa		M-1003 Irwin and Irwin 1961	970 ± 150	A.D. 727 (1032) 1300
5JF142	LoDaisKa		M-1005 Irwin and Irwin 1961	1150 ± 150	A.D. 627 (891) 1218
5JF142	LoDaisKa	Complex B	M-1008 Irwin and Irwin 1961	1150 ± 150	A.D. 627 (891) 1218
5JF142	LoDaisKa		M-1002 Irwin and Irwin 1961	1260 ± 150	A.D. 538 (776) 1037
5JF148	Crescent	Hearth	Not Available Stone and Mendoza 1994	480 ± 70	A.D. 1315 (1436) 1627

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF148	Crescent	Grid D4 Level 4	UCR-1304 Adkins 1997	550 ± 70	A.D. 1295 (1408) 1465
5JF148	Crescent	Grid D7 Level 4	UCR-1303 Adkins 1997	690 ± 70	A.D. 1225 (1295) 1408
5JF148	Crescent	Grid F4 Level 7	UCR-1301 Adkins 1997	1370 ± 70	A.D. 560 (662) 786
5JF148	Crescent	Hearth	Not Available Stone and Mendoza 1994	1440 ± 90	A.D. 427 (635) 776
5JF148	Crescent	Grid E6 Level 12	UCR-1203 Adkins 1997	1540 ± 70	A.D. 396 (544) 655
5JF148	Crescent	Grid D9 Level 8	UCR-1299 Adkins 1997	1595 ± 110	A.D. 232 (442) 661
5JF211	Falcon's Nest	Grid F8 Level 7-8	UGA-2089 Adkins 1993b	1100 ± 60	A.D. 789 (973) 1029
5JF211	Falcon's Nest	Grid F9 Level 4	Beta-34194 Adkins 1993b	1130 ± 50	A.D. 785 (896, 914, 955) 1014
5JF211	Falcon's Nest	Grid C7 Level 4	Beta-17607 Adkins 1993b	1150 ± 70	A.D. 709 (891) 1020

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF211	Falcon's Nest	Grid G8 Level 8-9	UGA-162 Adkins 1993b	1990 ± 240	753 B.C. (A.D. 19) 591
5JF223	Magic Mountain	Feature 3	Beta-75515 Kalasz and Shields 1997	1070 ± 80	A.D. 785 (989) 1162
5JF223	Magic Mountain	Feature 10 soil	Beta-77235 Kalasz and Shields 1997	1110 ± 50	A.D. 818 (967) 1020
5JF223	Magic Mountain	Feature 12	Beta-77138 Kalasz and Shields 1997	1220 ± 70	A.D. 664 (789) 985
5JF223	Magic Mountain	Feature 9	Beta-77136 Kalasz and Shields 1997	1310 ± 70	A.D. 626 (685) 886
5JF223	Magic Mountain	Feature 9D west soil	Beta-94378 Kalasz and Shields 1997	1310 ± 70	A.D. 626 (685) 886
5JF223	Magic Mountain	Top of Feature 11	Beta-77137 Kalasz and Shields 1997	1370 ± 80	A.D. 547 (662) 861
5JF223	Magic Mountain	Feature 9D east soil	Beta-94380 Kalasz and Shields 1997	1620 ± 60	A.D. 263 (427) 597
5JF223	Magic Mountain	Base of Feature 11B	Beta-94377 Kalasz and Shields 1997	1760 ± 50	A.D. 139 (256, 296, 319) 413

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF223	Magic Mountain	Feature 1	Beta-77135 Kalasz and Shields 1997	1790 ± 60	A.D. 87 (244) 408
5JF223	Magic Mountain	Base of Feature 11	Beta-94379 Kalasz and Shields 1997	1930 ± 70	50 B.C. (A.D. 80) 245
5JF321	Swallow	Feature 117	Beta-65275 Rathbun 1995	1040 ± 80	A.D. 870 (1011) 1178
5JF321	Swallow	Feature 130	Beta-55583 Rathbun 1995	1240 ± 90	A.D. 645 (782) 998
5JF321	Swallow	Feature 104	Beta-44397 Rathbun 1995	1370 ± 70	A.D. 560 (662) 786
5JF321	Swallow	Feature 17	Beta-45147 Rathbun 1995	1880 ± 90	45 B.C. (A.D. 130) 244
5JF339	Massey Draw	Stratigraphic sample	Beta-12801 Anderson et al. 1994	1960 ± 80	158 B.C. (A.D. 66) 240
5JF463	Dutch Creek	Feature 3	Beta-25579 Jepson and Hand 1994	1220 ± 60	A.D. 670 (789) 974
5JF463	Dutch Creek	Feature 4	Beta-22278 Jepson and Hand 1994	1430 ± 90	A.D. 431 (641) 779

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5JF463	Dutch Creek	Feature 1	Beta-21192 Jepson and Hand 1994	1980 ± 50	60 B.C. (A.D. 26, 42, 53) 131
5JF1780	Lena Gulch Burial	Charcoal Burial 1 Pit Fill	Beta-124401 Jepson and Hand 1999	1310 ± 40	A.D. 656 (685) 787
5JF1780	Lena Gulch Burial	Charcoal Burial 2 Pit Fill	Beta-126837 Jepson and Hand 1999	1430 ± 50	A.D. 547 (641) 678
5LO1	Peavy Rockshelter	Feature 2, Area C	GX-317 Wood 1967	810 ± 125	A.D. 996 (1245) 1405
5LO1	Peavy Rockshelter	Feature 5	GX-318 Wood 1967	1145 ± 155	A.D. 622 (892) 1224
5LO4	Kasper	Feature 3	GX-560 Wood 1967	655 ± 250	A.D. 889 (1304) 1954
5LO6		Feature 1	GX-564 Wood 1967	545 ± 150	A.D. 1219 (1409) 1658
5LR6	Flattop Mountain Game Drive	Blind 33	Beta-79742 Benedict 1996	880 ± 60	A.D. 1022 (1176) 1281
5LR6	Flattop Mountain Game Drive	Blind 89	Beta-79750 Benedict 1996	940 ± 60	A.D. 996 (1046, 1097, 1115, 1144, 1153) 1230

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR6	Flattop Mountain Game Drive	Blind 76	Beta-79748 Benedict 1996	1190 ± 60	A.D. 683 (881) 990
5LR6	Flattop Mountain Game Drive	Blind 7	Beta-79738 Benedict 1996	1210 ± 60	A.D. 674 (821, 840, 860) 979
5LR6	Flattop Mountain Game Drive	Blind 35	Beta-79743 Benedict 1996	1240 ± 60	A.D. 664 (782) 962
5LR6	Flattop Mountain Game Drive	Blind 23	Beta-79741 Benedict 1996	1290 ± 60	A.D. 650 (711, 746, 755) 886
5LR6	Flattop Mountain Game Drive	Blind 12	Beta-79740 Benedict 1996	1550 ± 60	A.D. 403 (541) 642
5LR6	Flattop Mountain Game Drive	Blind 65	Beta-79747 Benedict 1996	1550 ± 60	A.D. 403 (541) 642
5LR6	Flattop Mountain Game Drive	Blind 2	Beta-79736 Benedict 1996	1570 ± 60	A.D. 388 (535)630

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR6	Flattop Mountain Game Drive	Blind 3	Beta-79737 Benedict 1996	1600 ± 60	A.D. 339 (439) 607
5LR6	Flattop Mountain Game Drive	Blind 10	Beta-79739 Benedict 1996	1740 ± 60	A.D. 139 (264, 281, 329) 428
5LR42	Carter Lake Burial	Midden above burial	Beta-59297 Gleichman and Mutaw 1994	1650 ± 90	A.D.221 (415) 611
5LR42	Carter Lake Burial	Burial Pit Fill	Beta-59298 Gleichman and Mutaw 1994	1850 ± 90	32 B.C. (A.D. 146,190) 407
5LR97	Hutcheson Burial	Human Bone Burial 3	GX-531 Wade 1966	1805 ± 105	A.D. 1 (237) 443
5LR104	Owl Canyon Rockshelter	Feature 18	UGA-1350 Burgess 1977	930 ± 60	A.D. 1003 (1052, 1085, 1121, 1139, 1156) 1250
5LR104	Owl Canyon Rockshelter	Feature 11	UGA-1351 Burgess 1977	1005 ± 60	A.D. 896 (1021) 1170
5LR104	Owl Canyon Rockshelter	Feature 1	UGA-1349 Burgess 1977	1280 ± 80	A.D. 634 (719, 739, 766) 962

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR144	Kinney Springs	Feature 30, hearth on floor of house	Beta-10196 Morris and Litzinger 1985a	950 ± 60	A.D. 989 (1041, 1150) 1226
5LR144	Kinney Springs	From FCR under house floor	Beta-10195 Morris and Litzinger 1985a	1120 ± 60	A.D. 782 (898, 906, 961) 1023
5LR144	Kinney Springs	Feature 4, hearth	Beta-7328 Morris and Litzinger 1985a	1510 ± 70	A.D. 414 (563, 586, 591) 663
5LR144	Kinney Springs	Feature C	Beta-5126 Morris N.D.	1600 ± 100	A.D. 239 (439) 654
5LR144	Kinney Springs	Level 15	Beta-7329 Morris and Litzinger 1985a	1650 ± 70	A.D. 243 (415) 592
5LR200	T - W Diamond	Feature 10, floor	A 1274 Flayharty and Morris 1974	780 ± 220	A.D. 789 (1275) 1627
5LR200	T - W Diamond	Feature 2, floor	A 1273 Flayharty and Morris 1974	930 ± 230	A.D. 657 (1052, 1085, 1121, 1139, 1156) 1438
5LR200	T - W Diamond	Feature 11, floor	A 1272 Flayharty and Morris 1974	1550 ± 340	357 B.C. (A.D. 541) 1197
5LR220	Joe Wright	Feature 2	UGA-1387 Morris and Marcotte 1976	1690 ± 70	A.D. 220 (389) 542

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR220	Joe Wright	Feature 4	UGA-1864 Morris and Marcotte 1976	2000 ± 60	158 B.C. (A.D. 12) 130
5LR252	Spring Gulch	Hearth - Level 5	UGA-1051 Kainer 1976	880 ± 180	A.D. 782 (1176) 1421
5LR252	Spring Gulch	Level II up loc	UGA-1050 Kainer 1976	935 ± 140	A.D. 813 (1049, 1090, 1118, 1142, 1154) 1304
5LR252	Spring Gulch		UGA-664 Kainer 1976	1075 ± 135	A.D. 669 (987) 1251
5LR252	Spring Gulch	Level III up loc	UGA-670 Kainer 1976	1315 ± 135	A.D. 448 (683) 1009
5LR252	Spring Gulch		UGA-1049 Kainer 1976	1485 ± 70	A.D. 424 (603) 670
5LR252	Spring Gulch	Hearth - Level 3	UGA-673 Kainer 1976	1705 ± 70	A.D. 147 (350, 378) 537
5LR263	Lykins Valley	Hearth - Level 3	UGA-814 Ohr, Kvamme and Morris 1979	420 ± 80	A.D. 1400 (1454) 1654
5LR263	Lykins Valley	Hearth A	UGA-812 Ohr, Kvamme and Morris 1979	1370 ± 175	A.D. 340 (662) 1017

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR263	Lykins Valley	Hearth B	UGA-818 Ohr, Kvamme and Morris 1979	1675 ± 85	A.D. 148 (401) 594
5LR284	Lightning Hill	Feature 20	UGA-1386 Morris and Marcotte 1977	1580 ± 110	A.D. 239 (459, 478, 510, 531) 666
5LR284	Lightning Hill	Feature 3 – hearth	UGA-1389 Morris and Marcotte 1977	1635 ± 160	A.D. 69 (421) 683
5LR284	Lightning Hill		UGA-1863 Morris N D.	1770 ± 115	A.D. 12 (253, 304, 314) 545
5LR349	Echo Cave	Feature 3	Beta-42931 Brunswig 1990b	670 ± 80	A.D. 1225 (1300) 1427
5LR1085	Valley View	Surface under foundation of Structure 2	Beta-42935 Brunswig 1999	1080 ± 60	A.D. 870 (984) 1037
5LR1085	Valley View	Central hearth Structure 2	Beta-42932 Brunswig 1999	1160 ± 60	A.D. 718 (888) 1011
5LR1085	Valley View	Feature 2	Beta-42943 Brunswig 1999	1330 ± 50	A.D. 639 (676) 786
5LR1085	Valley View	Charcoal lens below Structure 1	Beta-42933 Brunswig 1999	1840 ± 50	A.D. 75 (215) 331

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR1098		Feature 12	Beta-23490 Grant et al. 1988	570 ± 60	A.D. 1295 (1403) 1444
5LR1098		Feature 34	Beta-23491 Grant et al. 1988	1080 ± 80	A.D. 782 (984) 1159
5LR1102		Stratigraphic date	Beta-23492 Grant et al. 1988	1650 ± 50	A.D. 295 (415) 542
5LR1112	Roberts Ranch Burial	Charcoal from burial pit	Beta-66090 Black 1997b	1520 ± 110	AD 260 (550) 690
5LR1112		Feature 2 – structure	Beta-24094 Grant et al. 1988	1200 ± 50	A.D. 688 (872) 974
5LR1370	Bode's Draw	May not be cultural	Beta-45388 Benedict 1993	440 ± 55	A.D. 1407 (1446) 1631
5LR1370	Bode's Draw	Feature 3 - hearth	I-15953 Benedict 1993	820 ± 80	A.D. 1028 (1229) 1303
5LR1370	Bode's Draw	Feature 1 rock-filled oven	I-15135 Benedict 1993	910 ± 80	A.D. 989 (1162) 1283
5LR1370	Bode's Draw	May not be cultural	Beta-45387 Benedict 1993	1510 ± 55	A.D. 426 (563, 586,591) 655

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5LR1370	Bode's Draw	Possibly not cultural	Beta-44738 Benedict 1993	1515 ± 55	A.D. 424 (558) 653
5MR472	Friehauf	Upper buried soil	Beta-61143 Madole 1994	860 ± 90	A.D. 1010 (1214) 1298
5MR472	Friehauf	Lower buried soil	Beta-52846 Madole 1994	1380 ± 90	A.D. 537 (660) 873
5PA153		Stratigraphic age Level 8	UGA-3888 Schubert et al. 1981	1345 ± 75	A.D. 597 (669) 880
5PA153		Stratigraphic age Level 5	UGA-3882 Schubert et al. 1981	1390 ± 135	A.D. 411 (657) 962
5PA153		Stratigraphic age Level 7	UGA-3887 Schubert et al. 1981	1410 ± 155	A.D. 340 (651) 973
5PA153		Stratigraphic age Level 7	UGA-3882 Schubert et al. 1981	1415 ± 100	A.D. 429 (649) 853
5PA153		Stratigraphic age Level 6	UGA-3883 Schubert et al. 1981	1425 ± 90	A.D. 434 (644)781
5PA153		Stratigraphic age Level 6	UGA-3884 Schubert et al. 1981	1560 ± 90	A.D. 263 (538) 660

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5PA153		Stratigraphic age Level 9/10	UGA-3890 Schubert et al. 1981	1575 ± 155	A.D. 127 (533) 774
5PA153		Stratigraphic age Level 7	UGA-3886 Schubert et al. 1981	1640 ± 110	A.D. 140 (419) 647
5PA153		Stratigraphic age Level 4	UGA-3881 Schubert et al. 1981	1760 ± 150	45 B.C. (A.D. 256, 296,319) 620
5WL27	Biggs	Mammal bone Feature 2	GX-566 Wood 1967	695 ± 110	A.D. 1069 (1294) 1437
5WL27	Biggs	Mammal bone Feature 1	GX-567 Wood 1967	735 ± 105	A.D. 1043 (1285) 1419
5WL27	Biggs	Mammal bone Stratum VI	GX-565 Wood 1967	1400 ± 90	A.D. 452 (654) 790
5WL32	Uhl	Mammal bone Stratum III	GX-324 Wood 1967	1210 ± 220	A.D. 415 (821, 840, 860) 1278
5WL32	Uhl	Stratum V	GX-319 Wood 1967	1755 ± 95	A.D. 73 (258, 292, 321) 537
5WL32	Uhl	Stratum V Feature 9	GX-320 Wood 1967	1955 ± 95	178 B.C. (A.D. 69) 317

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL38	Hatch	Unit 4 Wood's Unit IV/V	Beta-54615 Brunswig 1996	880 ± 50	A.D. 1028 (1176) 1277
5WL39	Wood's Lament	Feature 1	Beta-75446 Brunswig 1996	1070 ± 70	A.D. 819 (989) 1156
5WL47	Kersey Burial		I-188 Scott 1979	1780 ± 130	36 B.C. (A.D. 249) 554
5WL101	Happy Hollow Rockshelter	Hearth 3	GAK-1304 Steege 1967	780 ± 90	A.D. 1036 (1275) 1396
5WL101	Happy Hollow Rockshelter	Hearth 5	GAK-1303 Steege 1967	1270 ± 80	A.D. 639 (728, 732, 772) 968
5WL1483	Cass	CAI Feature 1	Beta-47101 Kalasz et al. 1992	1240 ± 80	A.D. 653 (782) 984
5WL1483	Cass	CAI Feature 6	Beta-47103 Kalasz et al. 1992	1260 ± 70	A.D. 653 (776) 962
5WL1483	Cass	CAI Feature 4	Beta-47102 Kalasz et al. 1992	1370 ± 60	A.D. 599 (662) 779
5WL1483	Cass	CDOT Feature 2	Beta-33946 Kalasz et al. 1992	1460 ± 50	A.D. 537 (619) 666

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL1813	Ehrlich Burial	Human bone Burial 1	Beta-47465 Brunswig and Wanner 1993	710 ± 60	A.D. 1225 (1290) 1398
5WL1813	Ehrlich Burial	Human bone Burial 2	Beta-50673 Brunswig and Wanner 1993	1740 ± 60	A.D. 139 (264, 281, 329) 428
5WL1849	Hilltop	Feature 1, Unit 2	Beta-83503 Brunswig 1996	700 ± 70	A.D. 1221 (1293) 1406
5WL1849	Hilltop	Feature 1, Unit 3	Beta-83502 Brunswig 1996	1170 ± 70	A.D. 684 (886) 1014
5WL1856	Rattlesnake Shelter	Feature 3, Unit 3	Beta-66569 Brunswig 1996	1920 ± 80	59 B.C. (A.D. 84) 320
5WL1997	Three O' Clock Shelter	Unit 6	Beta-74690 Brunswig 1996	920 ± 60	A.D. 1010 (1064, 1075, 1127, 1133, 1159) 1257
5WL1997	Three O' Clock Shelter	Unit 6	Beta-75448 Brunswig 1996	1030 ± 80	A.D. 880 (1014) 1202
5WL1997	Three O' Clock Shelter	Unit 5	Beta-83980 Brunswig 1996	1150 ± 60	A.D. 727 (891) 1014
5WL1997	Three O' Clock Shelter	Unit 7	Beta-83979 Brunswig 1996	1420 ± 60	A.D. 544 (646) 695

Table A-3. Late Prehistoric Radiocarbon Dates.

Site No.	Site Name	Sample Context	Lab No./ Report Reference	Radiocarbon Age B.P.	Calibrated Date* 2 sigma
5WL1997	Three O' Clock Shelter	Unit 7	Beta-83504 Brunswig 1996	1510 ± 70	A.D. 414 (563, 586, 591) 663

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