F O U R

Ritual Landscapes, Population, and Changing Sense of Place during the Late Prehistoric Transition in Eastern Colorado

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UNTIL RECENTLY, the study of prehistoric hunter-gatherer landscapes has focused on the distribution of different functional site types and their topographic and environmental contexts rather than on the relationship of people to their landscape. This is the case because the study of nomadic people, whose effect on non-site environments is (for the most part) imperceptible, is difficult within the limits of current methodologies because of a combination of low population density, a highly mobile, scattered population, and individualistic, family-centered technologies (Johnson 1989:214). This site-centered focus on environment has shed little light on these people's ideology and attitudes and has made examination of changing prehistoric perceptions of landscape seem out of reach.

Traditional human geography posits that the creation of cultural landscapes from natural landscapes was the natural outgrowth of human residence.

Thus, to the educated observer, cultural landscapes contain information that provides insight into the cultures that transformed them. Although developing the ability to "read the landscape" like a book was a goal of traditional cultural geographers, they thought this task was far more difficult because (unlike books) landscapes were never *meant* to be read (Lewis 1979:12). I disagree with the belief that reading the landscape is difficult. In fact, for much of human history humans have not only been familiar with the meanings attached to landscape, but we were *of* the landscape: an essential part of both the natural and the built environment. All landscapes in which people live have meanings attached to them at the individual, family, and community levels. These landscapes contain a multitude of places that serve as the subject and source of narratives, and these narratives are especially important to preliterate societies. Places serve as "durable symbols of distant events and as indispensable aids for remembering and imagining them" (Basso 1996:7). In this way, with or without the discernible presence of modification, *all* landscapes in which people live are cultural landscapes in that they contain information meaningful to their inhabitants.

In traditional cultural geography, space is neutral and is subject to measurement and physical division according to mathematical principles or models (Sahlqvist 2001). More recent study of landscapes has involved more symbolically oriented approaches (e.g., Tilley 1994). As theories, these two approaches have often been dichotomized. But Sahlqvist correctly contends that "constructive analyses of cultural landscapes rarely benefit from being polarized into a theoretical corner" (Sahlqvist 2001:79). Individual sites have meaning, as does the pattern of sites on the land. The perception and meaning of landscapes can be discerned through the analysis of the changing spatial patterns of ritually significant sites, as well as by the changes observed in these rituals through time.

In this chapter I examine the changes in technology, economy, and demography—and the context they provide for explaining changing ritual and its manifestation in landscape—during the transition from the Archaic stage (6400 B.C.–A.D. 150) to the Late Prehistoric stage (A.D. 150–1540) on the western High Plains. More specifically, this transition comes between the Late Archaic period (1200 B.C.–A.D. 150) and the Early Ceramic period (A.D. 150–1150), which correlates to the Developmental period (A.D. 100–1050) in the Arkansas River Basin (Zier and Kalasz 1999). The western High Plains during this time period has long been considered peripheral to the Plains Woodland societies of the Central Plains of Kansas and Nebraska, and researchers have explained cultural similarities between the two areas as the

result of spatial diffusion of cultural traits from east to west. But similarities between these two areas may in fact be evidence of parallel development of cultural institutions influenced by region-wide demographic forces that came into play at the end of the Archaic stage. These developments are reflected in, among other things, mortuary practice—primarily changes in spatial and cultural contexts of burials and burial sites at the regional, site, and individual burial levels.

Mortuary ritual is among the most complicated human behavior that can be interpreted from the archaeological record. It is not the result of a functional process and therefore forms "deliberate, planned, sacred spaces that serve to symbolically integrate families and communities and to provide continuity in the deep time of buried descent groups" (Hutchinson and Aragon 2002:28). So the changing contexts of mortuary ritual as indicated by burial practice reflect fundamental changes in the perception and meaning of landscapes and sense of place between the Late Archaic and Early Ceramic periods on the High Plains of eastern Colorado.

THE LATE PREHISTORIC TRANSITION IN EASTERN COLORADO

This chapter discusses portions of both the South Platte and Arkansas river basins of eastern Colorado. For these purposes, the western High Plains is defined as the portion of these basins from the base of the Southern Rocky Mountain foothills north, south, and east to the Colorado state line (Figure 4.1). This area contains portions of both the High Plains and Colorado Piedmont sections of the Great Plains Physiographic Province (Fenneman 1931).

The transition from the Late Archaic period to the Early Ceramic period in eastern Colorado is defined archaeologically by the appearance of new technologies, new economies, increasing population, and new social and ritual structures (Gilmore et al. 1999; Mitchell, this volume; Zier and Kalasz 1999). Archaeologists have often explained the appearance of new technologies in terms of simple spatial diffusion; technologies were adopted when they became available because of the adaptive advantage they represented. However, I contend that the acquisition of some of these technologies was not passive but instead occurred actively as a response to population pressure. These demographic changes have a deep history, beginning with the amelioration of climate at the end of the Pleistocene and gaining momentum throughout the early and middle Holocene. This trend of slow but relatively steady population increase culminated in a period of a much greater rate of increase that started ca. 500–200 B.C., just prior to the beginning of the Early Ceramic period,

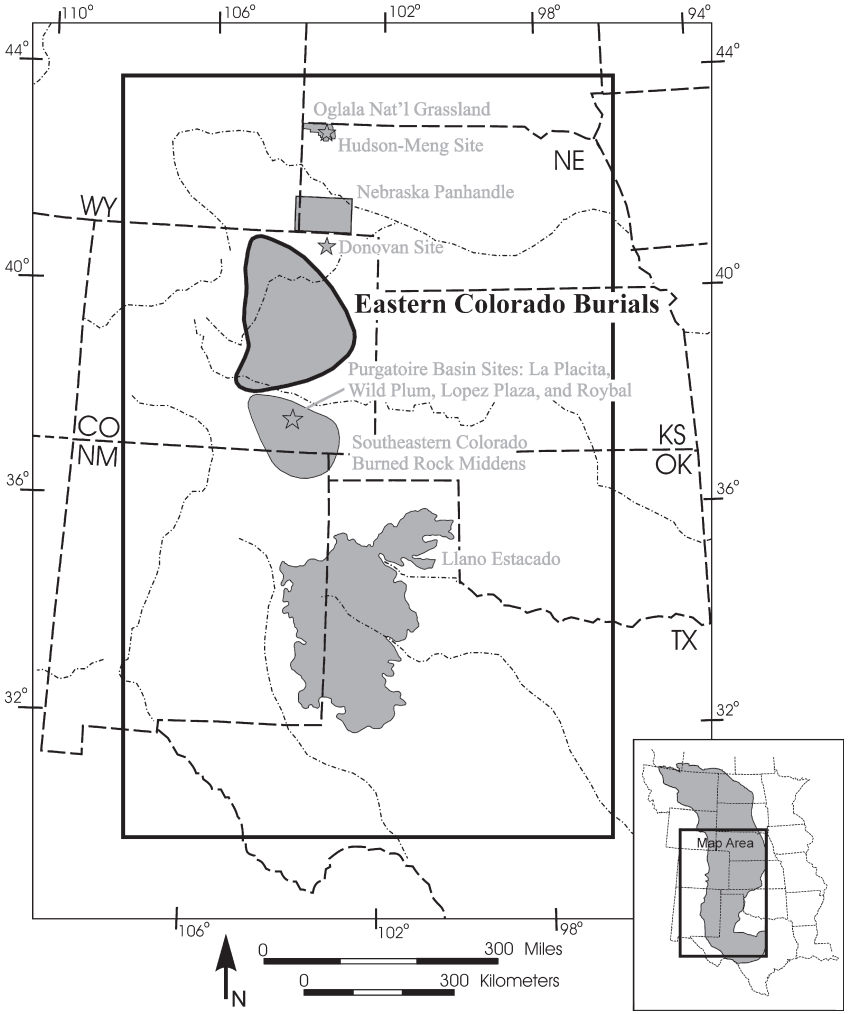

FIGURE 4.1.
Map of the High Plains, highlighting distribution of burials in the Platte and Arkansas river basins. Illustration by Kevin Gilmore.

and peaked in the later part of the period, ca. A.D. 1000–1200—just prior to the transition between the Early Ceramic and Middle Ceramic periods in the Platte Basin and in the middle of the Diversification period at A.D. 1300 in the Arkansas Basin. I also argue that changes in ritual and landscape percep-

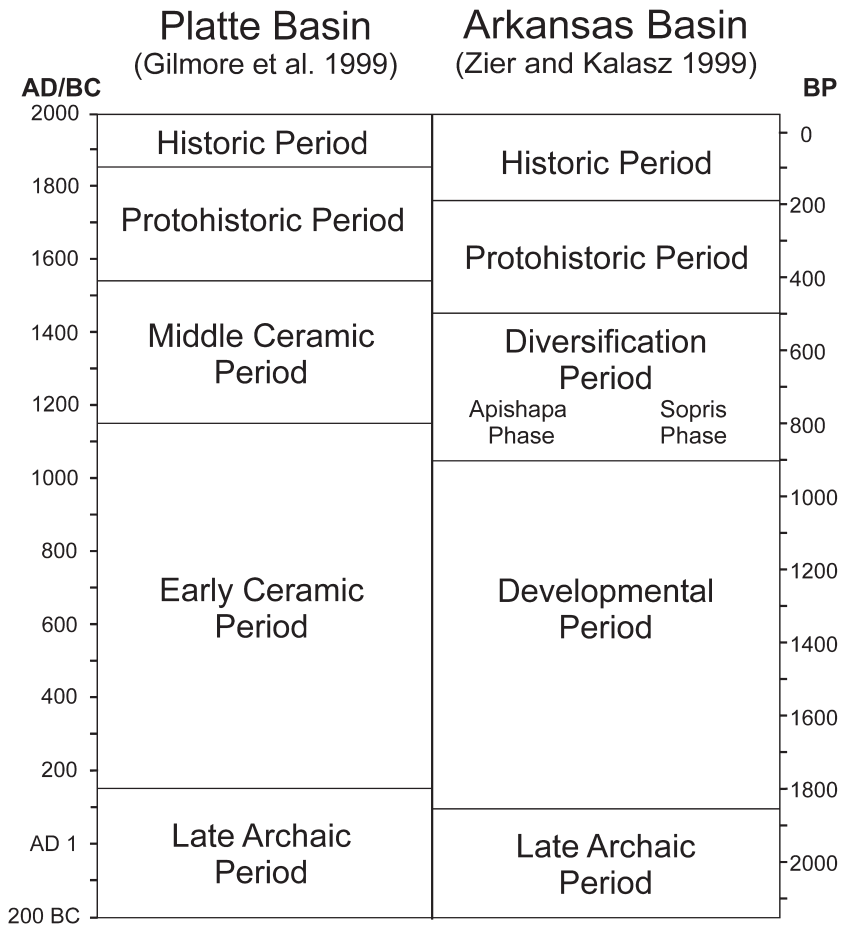

FIGURE 4.2.
Post-Archaic (Late Prehistoric–stage) cultural chronology for eastern Colorado used in this chapter.

tion reflected in mortuary practice can be best explained within the context of demographic and social changes, which in turn lead to redefined concepts of community.

The cultural chronologies for the Arkansas and South Platte basins of eastern Colorado are in relative agreement concerning the timing of major cultural events (Figure 4.2). The transition from the Late Archaic period to the Early Ceramic/Developmental period is the most easily recognizable of these transitions because it was accompanied by the most obvious changes.

These changes include the replacement or addition of basic technologies (e.g., replacement of the atlatl by the bow and the appearance of ceramics), increases in population and sedentism, changes in economy (more intensive processing of natural resources and increased use of cultigens), and changes in mortuary practice that echo the practices of Plains Woodland cultures of the Central Plains (Gilmore 1999; Kalasz, Mitchell, and Zier 1999).

Although relatively popular among archaeologists in the past, simplistic models invoking contagious diffusion that have been used to explain culture change in the western High Plains are inadequate because they assume that cultures are essentially passive. This assumption is not warranted; some technological and economic innovations were probably available to prehistoric residents of eastern Colorado for a long period of time prior to their adoption. For instance, counter to the unilinear diffusion model in which many have postulated the arrival of the bow from northeast Asia, recent research suggests that the bow may have been introduced to North America as early as 5,000 years ago, may have diffused to some groups but been independently invented by others, and was adopted, relinquished, and subsequently readopted by other groups over time (Nassaney and Pyle 1999). The same is true for ceramic technology, which was independently invented several times in North America and dates to as early as 3200 B.C. in the southeastern United States (Sassaman 1998) and to 2600–1600 B.C. in sites affiliated with the Late Archaic Nebo Hill complex of northwestern Missouri and eastern Kansas (Reid 1984). Early Woodland cord-marked, paddle and anvil manufactured Crawford Ware ceramics date to 470–70 B.C. in western Iowa (Benn 1990), yet ceramics do not appear in the archaeological record of eastern Colorado until ca. A.D. 400. These examples speak against simple, unilinear models of contagious diffusion in favor of models that support the active acquisition of technological innovations from the pool of available knowledge as the need arose. I believe the appearance of these technologies at the beginning of the Late Prehistoric stage in Colorado was a result of population pressure.

Ester Boserup (1965) argued that the evolution of agriculture was a process ordinarily pushed by increasing population density, that is, more advanced tools and techniques could squeeze more food from a given amount of land. However, she also demonstrated that the law of diminishing returns comes into play when more advanced techniques are used: more advanced technologies require a greater labor input for each unit of production compared with more traditional methods. Taking his cues from Boserup, Mark Cohen (1977) posited that the origins of agriculture on a worldwide scale could be attributed to resource stress as a result of population pressure resulting from amelioration

of climate at the end of the Pleistocene. These models of population pressure as a forcing mechanism have since been used to explain the adoption of many technological innovations. These models assume that cultures are in essence conservative, and a forcing mechanism is necessary (or at least highly likely) for new technology to be widely adopted.

Population increase precedes (or is perhaps coincident with) the appearance of some technological innovations in the archaeological record of the western High Plains, which fits the models of cause and effect between population pressure and the adoption of technology described here. However, does population pressure contribute to higher-level culture change, especially changing ideology as reflected in ritual? It is difficult to reasonably explain changes in landscape perception, ritual, or other aspects of ideology in terms of spatial diffusion of ideas from elsewhere or as a result of population pressure. However, it is more meaningful to posit these changes within the context of other changes in social structure and economy that may actually have their roots in changing demography. To determine the context in which the changes occurred, the dynamics of hunter-gatherer populations and the relative scale of changes in population, if not actual numerical estimates of population, must be estimated for the western High Plains.

ESTIMATING POPULATION SIZE OF PREHISTORIC HUNTER-GATHERERS

Estimates of prehistoric hunter-gatherer population are rarely attempted, for several reasons. Unlike populations of sedentary people for whom momentary population estimates can be made based on the floor areas of contemporaneous habitations and can be dated to a narrow time period using ceramic chronologies, hunter-gatherer groups were often highly mobile, and their impact on the landscape was ephemeral. The consequent meagerness of the archaeological record of these people, coupled with the less precise chronologies derived from radiocarbon ages, renders momentary estimates of their population by standard methods difficult. The few attempts that have been made to measure the population of prehistoric hunter-gatherers have met with mixed results. Measures of prehistoric human population based on environmental factors, such as carrying capacity derived from estimates of the biomass for a given environment, are a useful starting point (i.e., Hassan 1981). However, these models only provide a measure of the *potential* population of a given environment. Further, they make assumptions about both cultural adaptations and resource use that are almost always difficult, if not impossible, to make based

on archaeological data and also assume that environment and culture are static. These mathematical methods strive to derive the precise population number for a given region and usually result in a predicted range of population so large as to be of little practical use or in a specific figure that is impossibly precise (see Upham 1992). Yet even if the derivation of actual population numbers is beyond current methodologies, I believe *proportional* changes in prehistoric hunter-gatherer populations can be determined by several methods.

The number of archaeological components cross-dated to a particular cultural-historical period has been used widely as a rough measure of relative size of population, and the frequency of radiocarbon dates through time has also been used as a more detailed indicator of the relative size of population or intensity of occupation in large areas (Chatters 1995; Gilmore et al. 1999; Prentiss et al. 2005; Reed and Metcalf 1999; Zier and Kalasz 1999). Of course, issues of site formation, differential preservation of landforms, and research bias in a particular geographic area could potentially skew these data. However, the large size of the regions investigated and the resulting wide variety of depositional contexts (fluvial, aeolian, and colluvial) within the mountain, foothills, and Plains environments represented, coupled with the large number of sites recorded during cultural resource management projects (which document all the sites within a specific project area), militate against these biases. Even taking all these issues into consideration, archaeologists recognize that the number of components recorded for a certain period of time in a large area does in some way reflect the number of people who lived in an area at that time.

Based on this measure, archaeologists have hypothesized an increase in population in eastern Colorado between the Late Archaic period (ca. 1250 B.C.–A.D. 150) and the Early Ceramic period (ca. A.D. 150–1150) in the Platte Basin and the Developmental period (ca. A.D. 100–1050) in the Arkansas Basin. This increase in population culminates at the end of the Early Ceramic period in the Platte Basin but continues through the Developmental period and into the Diversification period (A.D. 1050–1450) in the Arkansas Basin. However, since the length of different cultural periods varies widely, the number of components cross-dated to a given period is not directly comparable to the number for any other period unless these counts are normalized using the amount of time during which the components accumulated—the length of the cultural period. Dividing the number of components assigned to a given cultural period by the length of the period in years and then multiplying the resulting quotient by 1,000 results in the Index of Occupational Intensity (IOI) (Larmore and Gilmore 2006). Graphing the IOI by period within the prehistoric cultural chronologies of the Platte and Arkansas river basins of east-

ern Colorado supports what archaeologists have suspected: that the number of components per unit of time increases and peaks in the Early Ceramic period in the Platte Basin and in the Diversification period in the Arkansas Basin. This result is somewhat at odds with the distribution of uncorrected radiocarbon dates for the Arkansas Basin, which indicates a peak in population toward the end of the Developmental period (Figure 4.3).

These different lines of information suggest an increase in population after the Late Archaic period in both basins and a subsequent drop in population after the Early Ceramic period in the Platte Basin and the Diversification period in the Arkansas Basin. However, because it is based on the number of components recorded for cultural periods lasting hundreds of years, the level of resolution of IOI data is so low that it has limited utility in determining the nature and structure of these hypothesized fluctuations in population. Although closer to a continuous measure of population, the distribution of uncorrected radiocarbon dates also seems at odds with the component and IOI data, showing a drop in population in the Developmental period rather than in the Diversification period.

Using the summed probability distribution of calibrated radiocarbon dates as a proxy for population has an advantage over the other methods described. Although not a representation of actual population numbers, the summed probability distribution associated with the set of calibrated radiocarbon dates from archaeological sites in the Platte and Arkansas basins does provide a visual representation of the rise and fall of population, occupational intensity, or both; the higher the peaks in the curve, the higher the probability contributed by radiocarbon ages from dated features created by prehistoric people. The resulting aggregated probability curves serve as a high-resolution proxy for relative size and concentration of prehistoric population for a given area (Figure 4.4). However, the nature of the calibration curve suggests that caution should be exercised with this method. As a result of fluctuating concentrations of atmospheric ^{14}C through time, the calibration curve is not a straight line but a series of peaks and valleys that document these fluctuations. As a result, some of the lower amplitude peaks and valleys on the population curve are artifacts of the calibration and not a reflection of population changes. For example, "wiggle matching" (Mauquoy et al. 2004; Ramsey, van der Plicht, and Weninger 2001) the summed probability curves to the radiocarbon calibration curve makes some of these artifacts explicit. This is especially obvious in the summed probability curve for the Arkansas Basin after A.D. 1300 (and to a lesser extent in the curve of the Platte Basin for the same time period), which reflects the calibration curve rather closely. Several flat sections of the calibration curve are

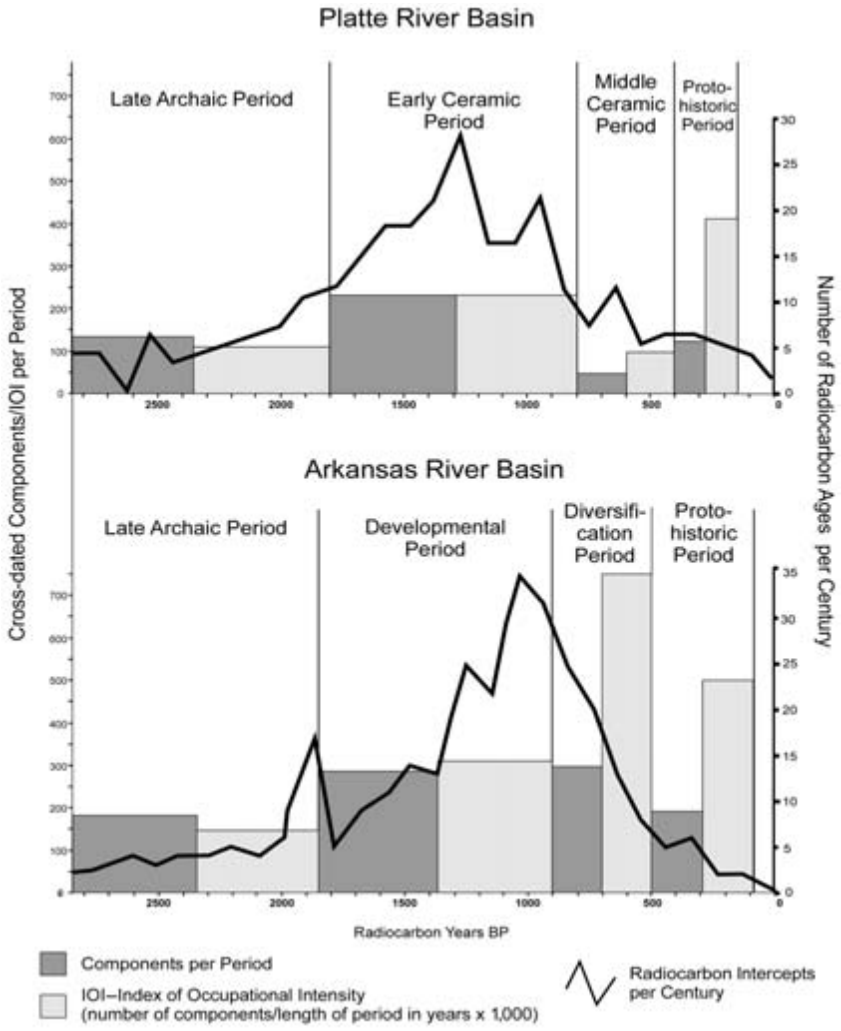

FIGURE 4.3.
Distribution of prehistoric radiocarbon ages (number of intercepts per century) in the Plains subregion of the Platte and Arkansas river basins, with number of components and Index of Occupational Intensity (IOI) per cultural period. Data compiled from Gilmore et al. (1999) and Zier and Kalasz (1999).

also reflected in the summed probability distribution curves for both basins. However, the larger trends do not reflect the calibration curve, and these higher amplitude changes are the ones that document population.

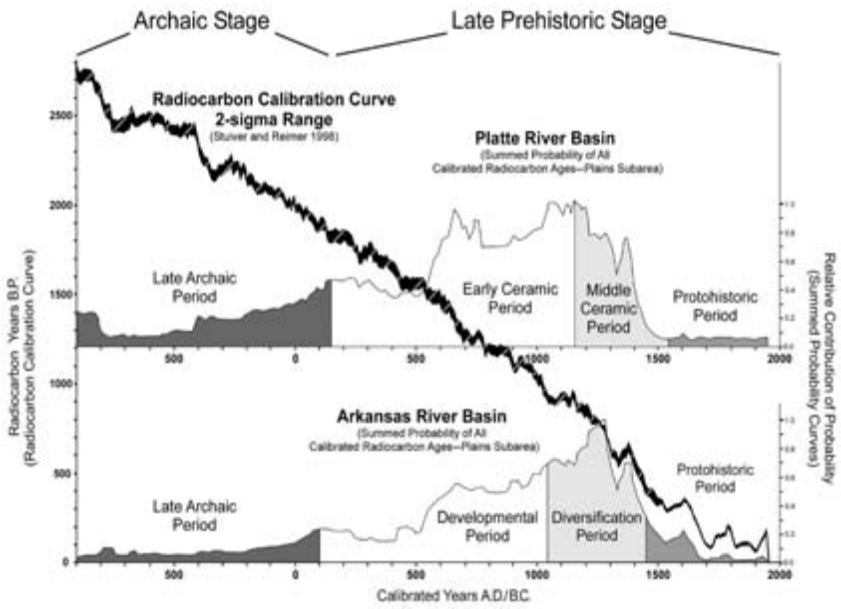

FIGURE 4.4.
Summed probability distributions of archaeological radiocarbon ages (proxy population) for the Plains subregion in the Platte (n=124) and Arkansas river basins (n=163), compared to the radiocarbon date calibration curve of Stuiver and Reimer (1998).

Calibration of radiocarbon ages and the generation of summed probability distribution curves for this study were accomplished using CALIB version 5.0 (Stuiver and Reimer 1993; Stuiver et al. 1998). Summed probability distribution curves generated from radiocarbon dates have been used elsewhere as proxy measures of the relative size of prehistoric populations, but the foci of most of these studies were relatively small geographic areas, such as a portion of the Southern Rocky Mountains in Colorado (Benedict 1999), the so-called Vacant Quarter of the lower Ohio River Valley (Cobb and Butler 2002), the Cherry Creek Basin of Colorado (Gant 2007), eastern Colorado (Gilmore 2004), and the southern coast of British Columbia (Lepofsky et al. 2005). The studies of larger regions to date have focused on late Pleistocene to middle Holocene populations in Europe (Gamble et al. 2005; Shennan and Edinborough 2007). All of these studies stress the relative nature of this method as an indicator of population trends and not as representing actual numbers. Lynn Gamble and

colleagues (2005) and Stephan Shennen and Kevan Edinborough (2007) have pointed out that these curves are remarkably stable and maintain the same general shape even when generated from large random samples of radiocarbon dates from a particular region.

Focusing on the last 2,900 years in the Platte and Arkansas basins, the summed probability of calibrated radiocarbon curves for both areas suggests that some changes in population were in phase during this period, while some changes were out of phase (Figure 4.4). These data reflect the population patterns posited for eastern Colorado but deliver them at a level of resolution that allows for a more detailed examination of the archaeological record. An increase in summed probability at the transition between the Late Archaic and the Early Ceramic/Developmental periods ca. A.D. 1–200 suggests that population increase coincided with, and therefore may have been a factor contributing to, the adoption of the technological innovations and social restructuring that characterized the Archaic/Late Prehistoric transition in Colorado. After approximately 800 years of population increase, population peaked in the Platte Basin ca. A.D. 1000–1150. This came at the end of the Early Ceramic period, which is characterized in the archaeological record by evidence of larger group size, decreased residential mobility, and limited evidence of incipient corn horticulture. A relatively precipitous decrease in population followed this peak into the Middle Ceramic period (A.D. 1150–1540), which is characterized in the archaeological record by smaller, more ephemeral sites indicative of smaller group size and a more dispersed and mobile population (Brunswig 1996; Gilmore 1999). Proxy population peaked somewhat later in the Arkansas River Basin (ca. A.D. 1200–1300) in the middle of the Diversification period (A.D. 1050–1450). This period was characterized by a general trend toward increased sedentism and more substantial and clustered habitation structures, limited corn agriculture, and aggregation of Apishapa-phase populations in larger (and sometimes fortified) village sites (Kalasz, Mitchell, and Zier 1999). Populations in the Arkansas Basin were higher and more aggregated for a century beyond the point when Early Ceramic populations in the South Platte Basin began to disperse.

POPULATION AND INNOVATION ON THE WESTERN HIGH PLAINS

Although determining cause-and-effect relationships among culture, technological and economic innovation, and population is problematic, it is obvious that a correlation often exists between population and the adoption of

technology and other cultural changes observed in the archaeological record. Within a model of population growth as the forcing mechanism, innovations are assumed to have been adopted because they imparted increased efficiency in the procurement and processing of resources, such as the introduction of the bow and ceramics, or because of the need to supplement existing resources, such as the adoption of limited corn horticulture. Evidence for this contention comes from the South Platte Basin, where the initial appearance of both the bow and arrow and corn horticulture in the archaeological record seems to coincide with periods of population increase, peaks in population, or both (Figure 4.5a, 4.5b). This model of technological innovation in response to population growth has some utility in explaining the adoption of basic technologies, but can it explain other, more subtle and complex changes in ritual that are also part of the Archaic to Late Prehistoric transition?

Most cultures possess a unique set of rituals associated with the treatment of the dead, and these rituals are used to "express and intensify a network of social, political, and economic transactions" (Krause 1995:131). It is in this way that burials, as artifacts of ritual, offer one of the clearest views in the archaeological record of how prehistoric people perceived themselves as a social group. Because of this feature, burials also have the potential to provide cultural information that could shed light on issues of ethnicity and social identity of the mobile Late Prehistoric hunter-gatherer people of eastern Colorado. Geography is an important characteristic of many ritual activities, and selection of location is one aspect of prehistoric behavior preserved in the archaeological record.

PLAINS WOODLAND MORTUARY PRACTICE

Based on similarities in burial offerings, placement on the landscape, topographic situation, and treatment of the remains, many parallels can be drawn between the mortuary practices of the Plains Woodland cultures of the Central Plains and those of the Hopewell Culture of the midwestern and eastern United States. Hopewell mortuary practice includes multiple primary and secondary interments and occasional cremations placed in constructed earthen mounds, some containing dry-laid masonry vaults, and inclusion of decorative grave goods. Plains Woodland mortuary practice includes all of these features, although mounds are relatively uncommon on the Central Plains and lack the formal masonry vaults characteristic of Hopewell burial mounds. However, mounds along the lower Republican River in Kansas were situated on high terraces overlooking the river valley (similar to the situation of Hopewell mounds),

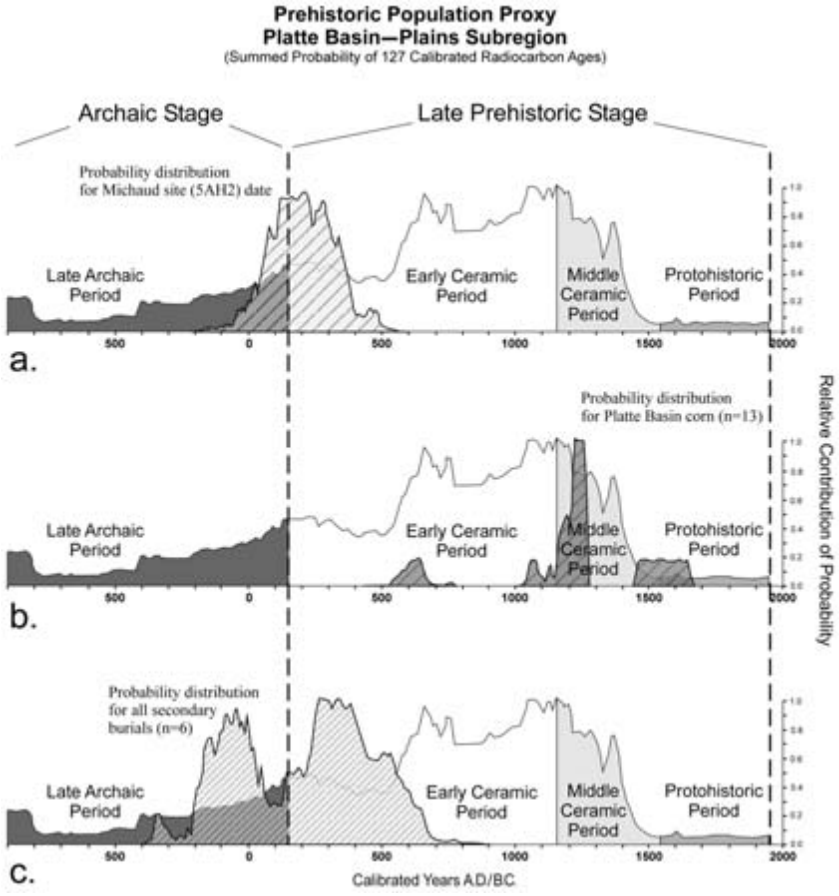

FIGURE 4.5.
Comparisons of proxy population curve for the Plains subregion of the Platte River Basin with the probability distributions of (a) the radiocarbon date from the Michaud site, which dates the earliest presence of small arrow points in the Platte Basin; (b) the radiocarbon dates associated with corn in the Platte Basin; and (c) dated secondary burials in the Platte Basin.

and some contained central depressions lined with stone slabs. In a few mounds these slabs formed walls similar to the dry-laid masonry chambers contained within the mounds built by the Kansas City Hopewell to the east (Wedel 1943, 1986:82–83). The burial mounds of the Republican River contained a combi-

nation of both flexed and extended primary burials, secondary bundle burials, scattered secondary disarticulated remains, and fragmentary cremated remains (Phenice 1969). Burial accompaniments were often included in an apparently random pattern within mound fill and included numerous 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*, pendants manufactured from freshwater shell, unmodified shell, and corner-notched and stemmed types of arrow and dart points (Wedel 1986).

The expression of Plains Woodland culture on the Republican River upstream in Nebraska was similar to that of the mound sites in Kansas, with the notable exception of burial mounds and a "somewhat more limited material culture inventory" at both burial sites and associated habitation sites (Wedel 1986:81). Despite the lack of mound construction, some of the burial sites were fairly substantial ossuaries containing the remains of dozens of individuals, and grave goods of the types described earlier are often found in great abundance (Kivett 1953:135). Although no evidence indicates that these sites had any durable aboveground features that would have made them as readily visible as sites with earthen mounds, many ethnographic accounts of the mortuary ritual of Native American groups on the Plains describe a variety of grave markers that would not necessarily be preserved in the archaeological record. These markers include poles with clan standards, scaffolds, small turf mounds, and log structures (DeMallie 2001). These examples demonstrate that there are ways other than the construction of burial mounds that would have served the purpose of marking burial locations without necessarily leaving obvious traces in the archaeological record. Even if the location of these burial sites was not obvious to outsiders, the living kin and descendants of the people buried there would have known their location, as evidenced by the multiple interments separated in time. These new modes of burial and the repeated use of burial sites represent a considerable increase in the investment of both time and economic resources over mortuary practice during the previous Archaic stage.

MORTUARY PRACTICE ON THE WESTERN HIGH PLAINS

Mortuary practice during the Late Prehistoric stage on the western High Plains is similar to that of the Plains Woodland cultures of the Central Plains, and some archaeologists have identified this pattern as the Colorado Plains Woodland Mortuary complex (Breternitz and Wood 1965; Butler, Chomko, and Hoffman 1986; Scheiber 2008; Scheiber and Gill 1997; Scott and Birkedal

1972; Wendt 2004). Just as Plains Woodland mortuary practice seems to be an attenuated version of the practices of Hopewell groups to the east, so the Late Prehistoric mortuary practice on the High Plains seems to be an attenuated version of the practice of Plains Woodland groups. This east-to-west trend is also reflected in the generally decreased complexity of habitation sites (suggesting increased residential mobility) and the diminished quantity and variety of material culture found at these sites. Although perhaps less obviously elaborate than the practices of contemporary groups to the east, mortuary practice of the Late Prehistoric people of the western High Plains was still significantly different from that of the people of the previous Archaic stage. Several of these differences are specific to the preparation and interment of the individual, and others are specific to the cultural and spatial context of the burial site. The most readily apparent differences in the treatment of individual burials between Archaic and Late Prehistoric mortuary practice are the increase in material culture elaboration and the presence of secondary burials. The changes in the cultural and spatial contexts of burial sites between the Archaic and Late Prehistoric stages are primarily in topographic situation and functional context (habitation site versus specialized burial site). Another difference is the significant increase in multiple burials from the Archaic stage to the Late Prehistoric stage. In addition, some archaeologists believe there was a shift in the location of burials from the foothills to the Plains between the Archaic and Late Prehistoric stages.

Support for any discussion of changing attitudes toward the landscape through time, as reflected in burial ritual, requires a critical examination of the available data. The observed differences between Archaic and Late Prehistoric burial practice have defied statistical analysis to date because of the relatively few sites containing burials, the small number of individual burials found at these sites, and the lack of detailed information recorded for some of the burials. While there is sufficient information to include a particular burial in the sample for a specific statistical test, the necessary information in support of a different test may not exist. Hence, the sample size for different statistical tests varies depending on the information available for individual burials and burial sites.

Statistical analysis of many of these trends is somewhat problematic because of the small sample size in some of the categories and the relative power of nonparametric tests compared to parametric tests. However, at this writing there are enough burials with sufficient associated information recorded for eastern Colorado to perform statistical tests on the data. The data set used for the present analyses includes 10 Archaic burial sites, with 13 individuals, and 31

Late Prehistoric (Early Ceramic–period) burial sites, with over 113 individuals (Table 4.1). Developmental-period burials from the Arkansas River Basin are included in the Early Ceramic sample. Statistical analysis is only a tool that helps confirm the validity of observed patterns of phenomena, and as such, a significant test does not necessarily confer significance to the pattern tested. However, these tests do allow the identification of meaningful relationships and differences. Although several of the statistical tests performed on the data suggest that there were no significant differences between the samples compared, the results of these tests are included because I believe they do suggest trends in the data. The chi-square tests were performed using JMP version 4.0; all chi-square tests were two-tailed, and the significance level was set at p=0.05. The Mann-Whitney *U* tests were performed according to the method outlined by Sidney Siegel (1956), and the significance level for these tests was also set at p=0.05.

All of the demonstrated differences in burial practice discussed later reflect significant changes through time in the rituals associated with death and the burial process, which in turn belong to a greater pattern of changes in technology, demography, settlement pattern, and economy that characterize the transition from the Archaic stage to the Late Prehistoric stage in a large geographic region from the Midwest to the High Plains. I believe these changes were accompanied by a fundamental reorganization of worldview, including essential alterations in how people constructed their cultural landscape. The specific transformations in burial ritual that seem to represent these changes are increases in material elaboration, the adoption of the practice of secondary burial, and changes in the cultural and physical contexts of burial sites.

Material Elaboration

One of the principal changes in burial practice between the Archaic and Late Prehistoric stages involves the type of goods interred with individuals. Archaic burials in eastern Colorado for which accompaniments can be determined (n=8) contain either utilitarian items (n=5, 63%) or no grave goods at all (n=3, 37%), with none containing goods thought to have a strictly decorative function. Although many Early Ceramic–period burials were also devoid of accompaniments (n=15, 29%), several contained what are construed as strictly utilitarian accompaniments (n=8, 16%). However, the majority of Early Ceramic burials contained decorative items for personal adornment (n=28, 55%), either in addition to utilitarian items or as exclusively decorative items. These decorative items are similar to those found in contemporary

Table 4.1. Archaic and Early Ceramic Burials Recorded in Eastern Colorado.

Site #	*Period*	*Site Name*	*# Ind.*	*Burial Type*	*Accompanying Artifacts*
JF.148	Early Archaic	Crescent	1	primary	none
AM.1733	Late Archaic	none	1	n/a	none
JF.052	Late Archaic	Bradford House III	1	primary	util
JF.211	Late Archaic	Falcon's Nest	1	primary	none
JF.211	Late Archaic	Falcon's Nest	2	primary	util
JF.211	Late Archaic	Falcon's Nest	3	primary	util
WL.2055	Late Archaic	Webster	1	unk	n/a
AH.006	Middle Archaic	Witkin	1	primary	util
CR.001	Middle Archaic	Draper Cave	1	primary	util
JF.321	Middle Archaic	Swallow	1	primary	n/a
JF.321	Middle Archaic	Swallow	2	unk	n/a
AM.014	Archaic	Badger Hill	1	primary	n/a
BL.285	Archaic	none	1	unk	n/a
AH.002	Early Ceramic	Michaud	1	primary	util
AH.120	Early Ceramic	Baumgartner	1	unk	none
AH.244	Early Ceramic	Aurora	1	secondary	none
AH.244	Early Ceramic	Aurora	2	primary	decorative non-shell
AM.003	Early Ceramic	H. Heights	1	primary	none
AM.003	Early Ceramic	H. Heights	2	primary	shell
AM.003	Early Ceramic	H. Heights	3	primary	n/a
AM.003	Early Ceramic	H. Heights	4	primary	none
AM.003	Early Ceramic	H. Heights	5	primary	none
AM.003	Early Ceramic	H. Heights	6	primary	shell
AM.003	Early Ceramic	H. Heights	7	primary	shell
AM.003	Early Ceramic	H. Heights	8	primary	n/a
AM.003	Early Ceramic	H. Heights	9	primary	n/a
AM.004	Early Ceramic	Byers	1	primary	n/a
BL.062	Early Ceramic	Sadar	1	unk	shell
BL.062	Early Ceramic	Sadar	2	unk	shell
DA.1687	Early Ceramic	C and A	1	secondary	decorative non-shell
DA.1687	Early Ceramic	C and A	2	secondary	decorative non-shell
EL.66	Early Ceramic	none	1	unk	util-ceramic
EL.67	Early Ceramic	none	1	unk	n/a
EL.67	Early Ceramic	none	2	unk	n/a
EL.67	Early Ceramic	none	3	unk	n/a
EL.67	Early Ceramic	none	4	secondary	n/a
EL.67	Early Ceramic	none	5	secondary	n/a
EL.67	Early Ceramic	none	6	secondary	n/a
EL.67	Early Ceramic	none	7	secondary	n/a
EL.67	Early Ceramic	none	8	secondary	n/a
EP.1177	Early Ceramic	East Fork	1	primary	shell, bone, util
EP.773	Early Ceramic	Red Creek	1	primary	none
JF.1780	Early Ceramic	Lena Gulch	1	primary	shell
JF.1780	Early Ceramic	Lena Gulch	2	primary	shell
JF.223	Early Ceramic	Magic Mtn.	1	primary	decorative non-shell

Age	*Sex*	*Functional Context*	*Topographic Context*	*References*
30–40	F	habitation	shelter	Finnegan (1997)
indet.	indet.	burial	low hill	Centennial Archaeology (2004)
45–55	M	habitation	shelter	Finnegan (1978)
50–60	M	habitation	shelter	Finnegan and Kilgore (1997)
35–45	F	habitation	shelter	Finnegan and Kilgore (1997)
infant	indet.	habitation	shelter	Finnegan and Kilgore (1997)
20–30	F	habitation	high terrace	Wanner and Brunswig (1992)
25–35	F	habitation	hill/high terrace	Swedlund and Goodman (1966)
25	M	habitation	shelter	Finnegan (1976); Hagar (1976)
indet.	indet.	habitation	shelter	Rathbun (1991)
indet.	indet.	habitation	shelter	Rathbun (1991)
n/a	n/a	habitation	hill	Prillwitz and Rathbun (1988)
n/a	n/a	habitation	n/a	OAHP Compass
35–55	F	habitation	1st terrace	Wade (1971); Wood (1971)
19–20	indet.	habitation	1st terrace	Hand (1986)
5	indet.	burial	1st terrace	Guthrie (1982)
35–39	M	burial	1st terrace	Guthrie (1982)
adult	indet.	burial	1st terrace	Buckles et al. (1963)
30–35	F	burial	1st terrace	Buckles et al. (1963)
indet.	indet.	burial	1st terrace	Buckles et al. (1963)
adult	indet.	burial	1st terrace	Buckles et al. (1963)
adult	indet.	burial	1st terrace	Buckles et al. (1963)
13–17	indet.	burial	1st terrace	Buckles et al. (1963)
7	indet.	burial	1st terrace	Buckles et al. (1963)
infant	indet.	burial	1st terrace	Buckles et al. (1963)
infant	indet.	burial	1st terrace	Buckles et al. (1963)
17–20	F	habitation	n/a	Wilshusen (2001)
adult	indet.	burial	1st terrace	Biggs (1966)
infant	indet.	burial	1st terrace	Biggs (1966)
12–18	F	habitation	1st terrace	URS (2003)
6–8	indet.	habitation	1st terrace	URS (2003)
adult	indet.	habitation	hill	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
n/a	n/a	burial	terrace	Gilmore (1999)
35	F	burial	2nd terrace	Chomko (1986)
20–25	F	burial	alcove	Butler, Chomko, and Hoffman 1986
35–45	M	burial	1st terrace	Jepson and Hand (1999)
35–39	F	burial	1st terrace	Jepson and Hand (1999)
unk	unk	habitation	shelter	Irwin-Williams and Irwin (1966)

continued on next page

Table 4.1—*continued*

Site #	*Period*	*Site Name*	*# Ind.*	*Burial Type*	*Accompanying Artifacts*
JF.223	Early Ceramic	Magic Mtn.	2	primary	n/a
JF.223	Early Ceramic	Magic Mtn.	3	primary	shell
JF.223	Early Ceramic	Magic Mtn.	4	primary	n/a
LR.042	Early Ceramic	Carter Lake	1	primary	none
LR.097	Early Ceramic	Hutcheson	1	primary	decorative non-shell
LR.097	Early Ceramic	Hutcheson	2	primary	n/a
LR.097	Early Ceramic	Hutcheson	3	primary	decorative non-shell
LR.1683	Early Ceramic	Roberts Ranch	1	primary	shell
LR.284	Early Ceramic	Lightning Hill	1	primary	shell
LR.284	Early Ceramic	Lightning Hill	2	secondary	none
MR.378	Early Ceramic	Gahagan-Lipe	1	primary	n/a
MR.378	Early Ceramic	Gahagan-Lipe	2	primary	shell
MR.378	Early Ceramic	Gahagan-Lipe	3	primary	util
MR.378	Early Ceramic	Gahagan-Lipe	4	primary	util
MR.378	Early Ceramic	Gahagan-Lipe	5	primary	shell
MR.378	Early Ceramic	Gahagan-Lipe	6	primary	shell
MR.617	Early Ceramic	Howard Rollins	1	primary	shell
MR.617	Early Ceramic	Howard Rollins	2	primary	shell
MR.617	Early Ceramic	Howard Rollins	3	primary	shell
OT.124	Early Ceramic	Ancell	1	primary	none
PE.009	Early Ceramic	Beacon Hill	1	secondary	shell
PE.079	Early Ceramic	Dave Fountain	1	primary	util
PE.079	Early Ceramic	Dave Fountain	2	unk	n/a
PE.1746	Early Ceramic	Bronquist	1	primary	util
PE.420*	Early Ceramic	Muldoon Hill	1	secondary	util
PE.420*	Early Ceramic	Muldoon Hill	2	secondary	util
Whitman Ranch	Early Ceramic	Whitman Ranch	2+	unk	shell, bone
WL.047	Early Ceramic	Kerbs-Klein	1	secondary	none
WL.047	Early Ceramic	Kerbs-Klein	2	secondary	decorative non-shell
WL.047	Early Ceramic	Kerbs-Klein	3	secondary	none
WL.047	Early Ceramic	Kerbs-Klein	4	secondary	none
WL.047	Early Ceramic	Kerbs-Klein	5	secondary	n/a
WL.047	Early Ceramic	Kerbs-Klein	6	secondary	n/a
WL.048	Early Ceramic	Kersey	1	secondary	none
WL.1813	Early Ceramic	Ehrlich	1	secondary	util
WL.1813	Early Ceramic	Ehrlich	2	secondary	none
WL.1986	Early Ceramic	Garcia	27	unk	shell
WL.4840	Early Ceramic	Newcomb	1	primary	none
MR.003	Early Ceramic	none	16	primary	decorative non-shell

Abbreviations: H.—Hazeltine; indet.—indeterminate; Mtn.—Mountain; unk—unknown; util—utilitarian

* The Muldoon Hill burial was evaluated as Middle or Late Archaic in the available documentation. However, because the burials are secondary and are accompanied by a large corner-notched projectile point, it is given an Early Ceramic affiliation.

Age	*Sex*	*Functional Context*	*Topographic Context*	*References*
n/a	n/a	habitation	shelter	Irwin-Williams and Irwin (1966)
indet.	indet.	habitation	shelter	Kalasz and Shields (1997)
35–45	M	habitation	shelter	Kalasz and Shields (1997)
45–55	F	habitation	1st terrace	Gleichman and Mutaw (1994)
35–40	F	burial	2nd terrace	Wade (1966)
30–35	M	burial	2nd terrace	Wade (1966)
45–50	F	burial	2nd terrace	Wade (1966)
50+	F	burial	1st terrace	Black (1997)
adult	M	habitation	low terrace	Morris and Marcotte (1977)
adult	M	habitation	low terrace	Morris and Marcotte (1977)
45–55	F	habitation	sand hill	Scott and Birkedal (1972)
16–18	F	habitation	sand hill	Scott and Birkedal (1972)
adult	M	habitation	sand hill	Scott and Birkedal (1972)
18–20	M	habitation	sand hill	Scott and Birkedal (1972)
juvenile	indet.	habitation	sand hill	Scott and Birkedal (1972)
infant	indet.	habitation	sand hill	Scott and Birkedal (1972)
n/a	n/a	burial	terrace	Breternitz and Wood (1965)
n/a	n/a	burial	terrace	Breternitz and Wood (1965)
n/a	n/a	burial	terrace	Breternitz and Wood (1965)
37–51	M	habitation	1st terrace	Black, Spurr, and France (1991)
45–55	M	burial	high terrace	Black, Spurr, and France (1991)
47–61	F	burial	low dune	Simonich (1979)
n/a	n/a	burial	low dune	Simonich (1979)
23–35	M	burial	1st terrace	McMahon and Sullivan (1994)
50	M	burial	1st terrace	Burner and Simonich (1984)
50	M	burial	1st terrace	Burner and Simonich (1984)
n/a	n/a	burial	hill or mound	Irwin-Williams and Irwin (1966)
adult	indet.	habitation	sand hill	Scott (1979)
juvenile	indet.	habitation	sand hill	Scott (1979)
indet.	indet.	habitation	sand hill	Scott (1979)
40+	indet.	habitation	sand hill	Scott (1979)
40+	M	habitation	sand hill	Scott (1979)
40+	F	habitation	sand hill	Scott (1979)
juvenile	indet.	habitation	1st terrace	Lutz (1974)
24–28	F	habitation	1st terrace	Brunswig and Wanner (1993)
21–23	M	habitation	1st terrace	Brunswig and Wanner (1993)
n/a	n/a	burial	1st terrace	Gilmore (1999); Greenway (1961)
young adult	F	burial	2nd terrace	Wanner and Brunswig (2004)
n/a	n/a	burial	hill	Gilmore (1999); Shalkop (1950)

Plains Woodland burials of the Central Plains, which were accompanied by strings of bone beads, such as those found at the Bisterfeldt site (25SF3) in Sioux County, Nebraska (Breternitz and Wood 1965; Mattes 1965; see also Peterson, this volume), or shell ornaments manufactured from both freshwater (most often freshwater clams of the genus *Lampsilis*) and marine species (often snails of the genus *Olivella*). The most common shell ornaments found in Late Prehistoric burial contexts are disk beads and clamshell pendants (some triangular and drilled with two suspension holes, similar to Hopewell gorgets) manufactured from freshwater species. As mentioned earlier, decorative materials do not accompany all Early Ceramic burials (in fact, a single site can contain burials that range from the most elaborate to the least elaborate burial types), but they do represent the addition of a unique type of burial to the established Archaic mortuary practice (Gilmore 1999:277).

Marvin Kivett (1953:118) observed that in Plains Woodland burials, ornaments—especially shell beads, bone beads, and shell pendants—were found more frequently in sub-adult burials than with adults. William Butler and colleagues (1986:23) also made this observation with regard to Late Prehistoric burials in eastern Colorado. A second perceived trend was that more female than male burials contained shell accompaniments. Burials of males often contained chipped stone tools, atlatl weights, and unmodified flakes, while ground stone and items of personal adornment were associated with females (Butler, Chomko, and Hoffman 1986:table 6). However, this pattern is not absolute; there are examples of males buried with both shell disk beads and *Olivella* beads (Black, Spurr, and France 1991; Jepson and Hand 1999; Morris and Marcotte 1977; Morris and Mayo 1979) and females buried with chipped stone tools, including a cache of tools that included both scrapers and projectile points, among other items (Jepson and Hand 1999).

In addition to the material elaboration of burials, some of the most compelling evidence of the cultural connections between the Plains Woodland and Early Ceramic peoples of eastern Colorado is similarities in how certain items are placed with the body. The placement of shell pendants and beads within the oral cavity in both Plains Woodland and Late Prehistoric burials on the western High Plains suggests a shared concept of the specific symbolic significance of placing decorative shell items in the mouths of the dead. This pattern has a relatively widespread geographic distribution and temporal duration; it was documented at Woodruff Ossuary in Kansas (Kivett 1953), as well as at the Early Ceramic–period Hazeltine Heights (Buckles et al. 1963) and Roberts Ranch (Black 1997) sites and the Middle Ceramic–period Chubbuck-Oman (Tipton 1967) site in Colorado. These burials have a temporal range of

600–1,000 years, from 1305±100 B.P. (2-sigma cal. range of A.D. 560–970) at Hazeltine Heights to 400±95 B.P. (2-sigma cal. range A.D. 1320–1800) at Chubbuck-Oman.

A statistical comparison of burials by accompaniment type (decorative, utilitarian, or no accompaniments) between the Archaic and the Early Ceramic was highly significant (chi-square=13.289, n=59, p=0.001), but the low expected frequencies within the cells containing the Archaic-stage sample make this result suspect. However, the lack of any Archaic-stage burials containing decorative items, compared with the 55 percent of Early Ceramic burials that do, would seem to be a significant difference. The same problems with insufficient sample size were encountered when testing the relationship between class of individual (male, female, or sub-adult) and type of burial accompaniments (decorative items versus utilitarian or no accompaniments) within all Early Ceramic burials. This was not possible because of the small size of each of these classes; only thirty-three burials have information on accompaniments, gender, and age. When the classes of females and juveniles are combined, and the classes of utilitarian and no accompaniments are also combined within a two-by-two contingency table, the comparison is not significant (chi-square=1.807, n=33, df=1, p=0.18), although a probability of 0.18 suggests a slight trend in the data toward different treatment of females and juveniles versus males. While this information may be statistically equivocal, an obvious change takes place in the range of items that accompany burials between the Archaic and the Late Prehistoric stages, and this is related to a changing social environment and the part burial of the dead played within that changed environment.

Secondary Burials

In addition to the increase in material investment in burial accompaniments from the Archaic stage to the Late Prehistoric stage on the High Plains, there is an increase in the amount of time invested in burial ritual, represented by the practice of secondary burial. Examples of secondary burials include bundle burials, interment of scattered disarticulated bones in ossuaries, and secondary articulated burials (Brunswig and Wanner 1993). All of these forms of interment require either exhumation of primary burials for reburial, the gathering of bones from scaffold or other aboveground burials, or the active postmortem removal of the flesh and disarticulation of the body. These actions require a period in which the body is allowed to decompose, which indicates a significant increase in the time and effort invested in the ritual preparation of the body after death—including disinterment—and collection and cleaning

of the remains. Of these activities, the secondary burial itself represents only the final act of the ritual process (Blick 2000; DeMallie 2001; DeMallie and Miller 2001; Hutchinson and Aragon 2003). As such, secondary interment suggests greater community involvement in mortuary ritual and process than primary interment does (Gold 2003). Secondary burial is not so much about the death of an individual; it has more to do with issues of group identity. Mortuary rituals consisting of several stages in a lengthy ritual cycle are often practiced by societies in which kinship is the principal means of social organization (Hutchinson and Aragon 2002:27). In this way, Early Ceramic–period secondary burial indicates a *qualitative* rather than a *quantitative* change in mortuary ritual from the Archaic stage, so there is no basis for statistical comparison between secondary and primary burials.

In Plains Woodland sites, secondary burials occur with primary burials in the same burial sites, sometimes in the same burial pits. On the High Plains of eastern Colorado, secondary burials are most often found associated with other secondary burials at sites with more than one burial, although not exclusively so. Of the nine documented sites that contain secondary burials, three also contain primary burials (Table 4.1). This is consistent with ethnographic accounts of the burial practice of Native Americans on the Plains. Many groups historically practiced both scaffold and earth inhumation, and the ultimate disposition of the body was often determined by individual choice before death (Brown and Irwin 2001; DeMallie 2001; Newcomb 2001; Schweitzer 2001; Stewart 2001; Wood and Irwin 2001). Differences in the form of interment could also be related to differences in practice between kin groups within the same social group (Buikstra and Charles 1999). Within archaeological contexts, it is difficult to determine whether contemporaneous secondary and primary burials at a particular site represent the end result of different burial practices or different stages in the same multistage mortuary ritual (Hutchinson and Aragon 2002:47). Accompaniments are usually absent from secondary interments, possibly as a result of loss or deterioration during the extended period of time the body is aboveground.

Secondary burials appear in the archaeological record prior to the end of the Archaic stage in Colorado, and the few dates available cluster in the terminal Late Archaic period and the initial part of the Early Ceramic period. The summed probability distribution for secondary burials is also bimodal, extending from the terminal Late Archaic and overlapping the Archaic/Late Prehistoric transition (Figure 4.5c). The dates for secondary burials place them at a time when population was growing in the later part of the Late Archaic period and into the initial Early Ceramic period, just prior to a rapid increase

in population that began ca. A.D. 500. Based on these data, it is tempting to posit the migration of a population to eastern Colorado from the Central Plains during the terminal Late Archaic period (ca. 200 B.C.) that practiced secondary burial and was subsequently pushed out of the region ca. A.D. 500 by the expansion of local populations practicing primary inhumations. However, in the absence of additional data (cultural or genetic), further discussion is purely speculative.

Site Context

In addition to changes in the treatment of individual burials, changes took place in the spatial and cultural contexts of the sites where burials were placed. The location of burials changed from primarily habitation sites during the Archaic to almost exclusively burial sites during the Late Prehistoric. These later sites were also situated topographically in ways that were more visible within the surrounding landscape. In addition, the number of both multiple-burial sites and interments at these sites increased. All of these factors suggest that changing rituals and the growing social importance of those rituals were reflected in the increasing importance of burial sites, which became specialized locations often used exclusively for interment and situated prominently within the landscape.

Perhaps the most meaningful evidence of the changing social context of burial ritual in Early Ceramic society is the increase in the number of sites used exclusively for burial. While the vast majority of Archaic burials are found in habitation sites (n=9, 90%), the number of Late Prehistoric habitation sites that also contain burials represents the minority of all Late Prehistoric burial sites (n=13, 42%). This difference is highly significant (chi-square=7.513, n=38, df=1, p=0.006) and suggests a developing attitude through time toward society's need for the dead to occupy a space exclusive to them.

Not only does the creation of a special place for interring the dead indicate the growing importance of the associated ritual, but the reuse of these places also amplifies their social and ritual importance. Of all the Archaic burial sites, only one (Falcon's Nest) contains as many as three interments (10%), whereas one-third (n=11, 35%) of Early Ceramic burial sites contain three or more interments, with a maximum of nine individuals at well-documented sites and at least twenty-seven individuals at the incompletely documented Garcia site (Table 4.1). Using the Mann-Whitney *U* test for large samples, a rank order comparison of the number of interments at Archaic-stage and Early Ceramic burial sites indicates that the difference in the number of burials at sites dating

to different periods is significant, at a 95 percent level of confidence (p=0.0212, n_1=10, n_2=31, *U*=212, *z*=2.03).

Although the number of Late Prehistoric burial locations that are also habitation sites (n=13, 42%) is not substantially different from the number of locations used exclusively for burial (n=18, 58%), the latter group of sites contains 74 percent of all burials. When a rank order comparison of the number of interments is made between habitation sites and specialized burial sites for Archaic- and Early Ceramic–age sites using the Mann-Whitney *U* test, the difference is significant, with an associated probability of less than 0.001 (n_1=13, n_2=18, *U*=92). Not only were special sites for the interment of the dead created during the Early Ceramic period, but these sites were also used repeatedly through time as part of burial ritual.

The creation of a place of ritual significance or other importance is the product of a sequence of actions; both the initial decision and the subsequent practice are reinforced by these actions. Thus, these places are "both informed by particular structures of meaning as well as constitutive of such structures. As such, sequential social action derives from preexisting meanings that are either reinforced or modified through practice" (Mitchell, this volume). With this in mind, the selection of a burial place that was used repeatedly by mobile hunter-gatherers is the end result of a series of decisions that took into consideration both human agency and the contingencies of death. Where and how an individual was ultimately buried depended on many factors in hunter-gatherer societies, including time of year, the individual's location at time of death, the individual's status and perceptions of the individual by the family and social group, and individual preference (Bailey 2001; Brown and Irwin 2001; DeMallie 2001; Schweizer 2001; Stewart 2001; Wood and Irwin 2001). The return of a body to a designated burial site was the end result of what was potentially a long and involved process for hunter-gatherers prior to the introduction of the horse.

As a part of this pattern of increasing meaning of place, special topographic situations were also selected for burial locations. The number of Archaic and Early Ceramic sites containing burials is approximately split between prominent topographic situations, such as the crest of hills or high terraces, and less prominent locations, such as low terraces and rock shelters. However, the majority of Early Ceramic sites with three or more burials (n=8, 73%) are situated in topographically prominent locations. In the Midwest, Woodland burials were often placed in constructed mounds that accentuated the visibility of burial locations already situated on topographic high points. Other Early Ceramic–period burials on the High Plains of Wyoming and Nebraska, espe-

cially multiple-burial sites, are associated with constructed mounds (Scheiber 2008), although only two poorly documented sites in eastern Colorado, Sadar and Whitman Ranch, are recorded as possibly having mounds constructed over them. Mound construction is only one method, albeit the most permanent one, that has been used over time to signify burial sites. As mentioned earlier, historical accounts of burial ritual on the Plains abound with references to wood structures, poles with clan insignia, and turf mounds and rock mounds erected over burials (Liberty, Wood, and Irwin 2001).

Besides noting the shift from habitation to specialized site reserved exclusively for burial, some archaeologists working in eastern Colorado have suggested a shift in the geographic context of burials between the foothills for Archaic burials and the Plains for Late Prehistoric burials (Johnson and Adkins 1997:157). Although there is a higher proportion of Early Ceramic burial sites on the Plains (n=20, 71%) compared with Archaic burial sites (n=5, 50%), that difference is not statistically significant (chi-square=1.458, n=38, df=1, p=0.22). Rather than the result of conscious placement of burial sites in the foothills or the Plains, the impression that Archaic people buried their dead more often in the foothills and Early Ceramic people more often on the Plains is probably related to more general changes in settlement patterns that began in the Early Archaic period and lasted through the Protohistoric period. The location of the geographic mean centers for all Archaic and Early Ceramic sites suggests a general west-to-east trend in the location of all sites through time (Figure 4.6). Thus, the impression that Early Ceramic people chose burial sites out on the Plains more often than people did during the Archaic stage may just be a reflection of this more general settlement pattern. However, while the geographic mean centers of all Archaic sites and sites with burials occupy almost the same point, suggesting no difference in the selection of burial sites versus all site locations, the geographic mean centers for the spatial distribution of burial sites versus the mean center for all Early Ceramic–period sites are spatially distinct, which suggests a difference in the way burial sites were selected relative to the way habitation sites were selected.

In summary, measurable and significant differences exist in the geographic and cultural contexts of burial sites between the Archaic and Late Prehistoric in eastern Colorado. Are these differences culturally meaningful? Statistics are a useful tool for testing hypotheses, and in this way they provide a somewhat arbitrary mathematical measure of "significance" per se; however, they are only a tool for analysis and do not actually confer significance on a set of observations. With this in mind, statistics do provide a method that can reinforce the validity of trends in the burial site location and cultural context perceived over

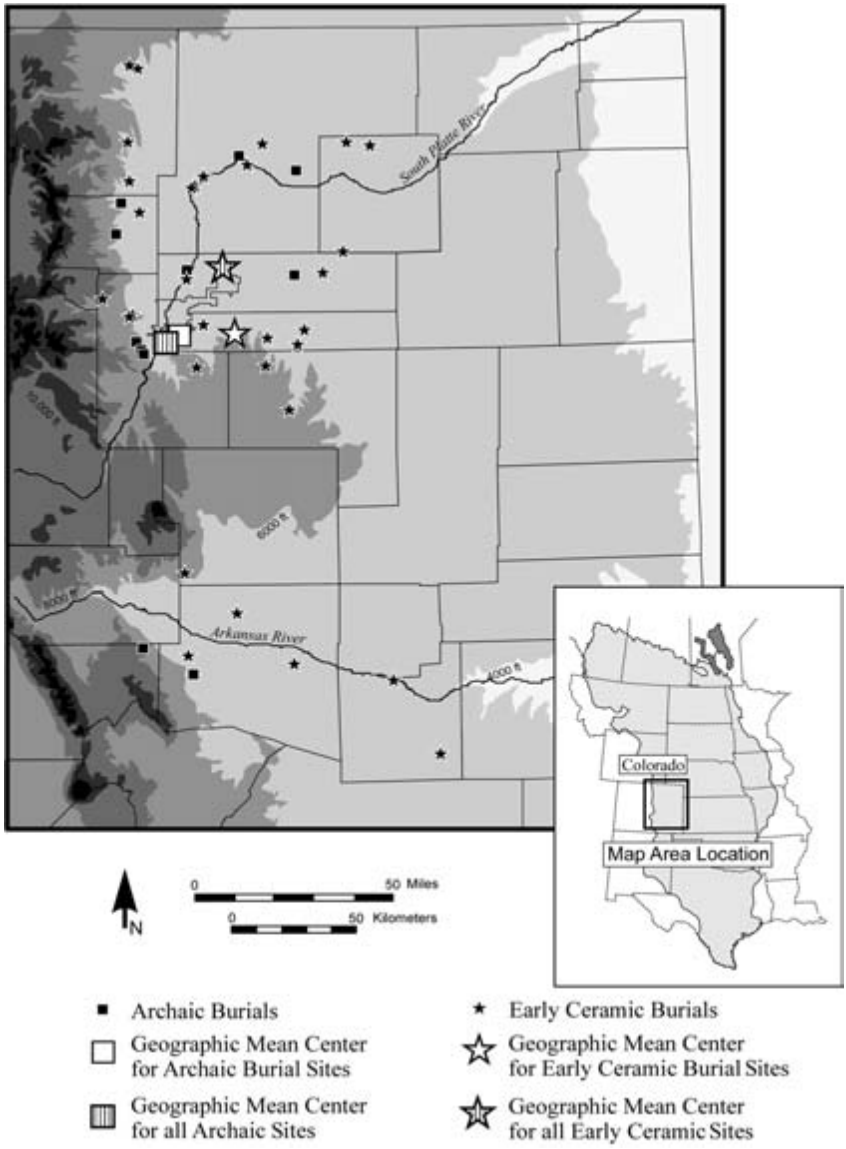

FIGURE 4.6.
Elevation map of northeastern Colorado with the locations of both Archaic and Late Prehistoric sites containing burials. The geographic mean centers (average location) for burial sites and all sites for both periods are also indicated.

the years (Breternitz and Wood 1965; Butler, Chomko, and Hoffman 1986; Scott 1979; Scott and Birkedal 1972). In all, changes in burial ritual from the Archaic stage to the Late Prehistoric stage suggest greater elaboration of the rituals surrounding the burial process, and this suggests a qualitative change in the concepts of death, community, and ethnic identity.

DISCUSSION AND CONCLUSIONS

For millennia in North America, the places where the dead are buried have been used to mark the landscape "in ways that carried social, political, and religious meaning" (Buikstra and Charles 1999:203). This is true on the High Plains of eastern Colorado. Archaic mortuary practice—for which evidence for elaborate ritual is absent and which is characterized by the predominance of single burials located in habitation sites with either utilitarian or no burial accompaniments—reflects what I interpret as site-centered identification with the landscape. As such, it suggests that Archaic people identified the band as the primary social unit. In contrast, Late Prehistoric mortuary practice—which included repeated use of specialized burial sites, more prominent topographic situations, exotic accompaniments, and postmortem manipulation of the body (as in secondary burials)—suggests profound changes in the rituals surrounding death and an extension of social ties beyond the local area, possibly reflecting identity based on a larger social entity. All of this suggests a fundamental change in the socially constructed concept of landscape.

The shift to multiple burials interred in specialized mortuary sites suggests a fundamental change in attitude toward death that reflects greater community integration. These sites were reserved for the dead, and as such they were set aside as sacred ground, separated both spatially and functionally from economic and social activities of the living. Multiple interments on a site over time indicate a traditional association with those sites and a greater time depth of use. The practice of returning to a burial site, not because it was convenient but as a ritual requirement soon after the time of death (in the case of primary inhumations), reinforces the importance of place. The multiple number of individuals interred in these specialized sites (n=82, 74%) suggests that larger communities identified them as sacred, and placement in topographically prominent positions both reinforced the uniqueness of the place and sent a message declaring to whom this land belonged to those outside the group, as well as reinforcing that message to members of the group. Contingencies that interfered with completion of the ritual or decisions made by groups or individuals (including personal preference of the deceased) that contradicted the

established ritual could account for the 26 percent of all Early Ceramic burials found at sites containing fewer than three burials.

The increased use of shell ornaments as burial accompaniments during the Early Ceramic period suggests greater contact with cultures to the east and southwest through trade in exotic goods. These trade relationships would also have served as conduits for ideas as well as goods. The inclusion of exotic materials in burials suggests a different conceptualization of the dead and their importance and needs. Differences in the quantity and variety of burial accompaniments are best understood in terms of the roles and status of the living as well as those of the dead (Buikstra and Charles 1999:211; Hutchinson and Aragon 2002:46), so this trend toward an increased number of shell ornaments accompanying female and juvenile burials during the Early Ceramic period could be an indication of changing cultural attitudes and perhaps changing social stature and roles of women and children. Likewise, it could also indicate incipient economic stratification, a possibility suggested by the quantity and exotic nature of many of the shell items. Economic status is often related to the number of regional trade partners, and the importance of those relationships would be communicated by the inclusion of exotic goods in burials. Shell ornaments may also have had symbolic meaning beyond economics. The inclusion of shell ornaments and ceramics depicting water birds in burials in Hopewell mounds and the situation of these mounds next to rivers have been interpreted by some as reflecting the importance of water in the acts of bathing and cleansing incorporated in world renewal rituals. In addition, water may have been the symbolic entryway into the underworld and therefore important to mortuary ritual (Buikstra and Charles 1999:215–216). Changing ideology that emulated that of the Hopewell may explain the shift in burial site location from rock shelters in the Late Archaic period to stream terraces in the Early Ceramic period.

Shell items found in burial contexts on the western High Plains are from several sources. The items include species of marine shell such as *Olivella,* which are most often sourced (when identified to species) to the Gulf of Mexico, with some shells sourced to the Gulf of California and the Pacific Ocean (Kozuch 2002). The majority of shell disk beads and pendants found in eastern Colorado burials are manufactured from freshwater species of *Lampsilis* or other freshwater mollusks. Although freshwater mollusks do inhabit the western High Plains of eastern Colorado, the species native to the region do not possess shells of sufficient thickness to have provided the material for the manufacture of the disk beads observed in burials (Wu 1989). In this case, even the freshwater shells found in burials would have to have been acquired from the Central Plains through trade or long-distance travel.

The increase in the amount of exotic shells and the specialized way these goods were placed on the body are indicative of two things. First, there seems to have been greater regional interaction during the Early Ceramic period than during the Archaic stage in the trade of both materials and ideas. Second, the exotic materials acquired through this trade would have possessed great economic value because of their rarity and the difficulty in acquiring them. The inclusion of items of this nature in burials marks them as "sacra," that is, items of and for ceremonial display that are related to cult institutions (Knight 1986, in Krause 1995). The manipulation of the bodies and bones of the dead also marks the burials themselves as sacra (Krause 1995:137). In this context, the trend in eastern Colorado toward special mortuary sites and away from habitation sites for burial suggests that the burial site itself became sacra and as such had a very different place in the ideology of the community than did the habitation sites, even those also used for burial.

What was the basis for these seemingly fundamental changes in burial ritual? Others have posited economic and environmentally based explanations for the sorts of changes observed in eastern Colorado (Charles and Buikstra 1983; Goldstein 1976, 1980; Saxe 1970). These explanations tied the "development of specialized, permanent and bounded areas for exclusive disposal of the dead to ritual affirmation of corporate group control of crucial restricted resources" (Buikstra and Charles 1999:203). Although this perspective has been subject to criticism (e.g., Hodder 1980, 1982; Shanks and Tilley 1982), it still has explanatory utility in some situations as long as human agency is also taken into account (Buikstra and Charles 1999:204; Morris 1991). I believe this theoretical perspective does have some explanatory utility for the Archaic/Late Prehistoric transition in eastern Colorado.

Taken as a whole, the data here suggest that perceptions on the landscape changed during the transition from the Archaic to the Late Prehistoric. The shift from what appears to be a site-based perception of landscape in the Archaic stage to a larger, territorial perception of landscape that was seemingly part of the transition to the Late Prehistoric, as well as the context in which these changes occurred, suggests that at least indirect functional reasons existed for this shift. Relatively low population densities make control of a specific territory somewhat irrelevant—a sufficient quantity and variety of resources are distributed throughout the landscape, and no one group can exhaust or otherwise diminish any of the critical resources. The shift to a territorial sense of place during the transition to the Early Ceramic period has its origins in increasing population pressure and decreased residential mobility, as well as the resulting need to exercise greater control over access to critical resources.

Decreased residential mobility may have been the consequence as population increased and mobile hunter-gatherer groups divided into smaller, possibly mutually antagonistic groups, some of which moved into other areas within the original group territory. This would have effectively reduced the size of the territory that could be utilized by both groups, resulting in less space between times when resource areas were revisited. That in turn would have hampered the full recovery of the resource prior to the next visit, ultimately resulting in decreased productivity. Populations continued to grow; as a result, overly large groups divided and subdivided, and these groups became spatially constrained in progressively smaller territories. Because of this increasing circumscription, people had less access to dispersed resources, which necessitated more efficient use of the available resources required to survive. In addition to using known resources with greater efficiency, this situation compelled people to use a greater variety of resources, both animal (including a greater variety of animals overall and in particular a greater number of small animals) and plant. Because they were more spatially concentrated, plant resources became proportionally much more important for subsistence, as access to large migratory mammals (such as bison) was increasingly restricted as a result of the decreasing size of territory and subsequent limitations of access to migration routes. As population continued to grow in an environment that offered no further group fission options, consumer demand increased within a now-constrained space, and some sort of production system (i.e., agriculture) became mandatory (Binford 1968, 1983). Within this scenario, greater control of a smaller territory was necessary to guarantee access to critical resources, and the importance of territory and group identity was reinforced through repetition of rituals (such as burial ritual) at special places on the landscape. These recurring rituals created and reinforced community cohesion. The choice of topographically prominent locations to perform these rituals communicated possession of this territory by all members of the community, both living and dead, to other communities.

The changes in mortuary practice that characterize the transition from the Archaic stage to the Late Prehistoric stage on the High Plains of eastern Colorado reflect fundamental changes in the complexity and importance of the rituals surrounding death. Although many of these changes relate to the increased material elaboration and postmortem manipulation of individual burials, the most significant changes have to do with the cultural contexts of the burial sites and their relationship to changing perceptions of the cultural landscape and territory. Unlike patterns of mortuary practice established during the Archaic stage, many of the Early Ceramic burial sites were reserved for the exclusive use of the dead, separated both spatially and functionally

from other activities; as such, they represent sacred places whose growing importance was enhanced and reinforced by repeated use through time. This change in the social context of the burial site, coupled with the shift from a pattern dominated by single burials in less visible situations—such as rock shelters—to one of multiple burials in topographically prominent situations, suggests not only that these changes were important to the people participating in the rituals but also that it was more important than before to signal the location of these places to others. This growing importance of special places on the landscape and the need to communicate the location of these places suggest a change in the importance of territory and a concomitant need to control that territory. The fact that these changes were not universal suggests that not everyone felt compelled to follow the pattern, and situational contingencies cannot be ruled out as the source of these variations in mortuary ritual. However, changes in the overall pattern of burial ritual and the increased variation within this pattern suggest that something larger was affecting and reinforcing the changes.

In addition to changes in mortuary practice, the transition from the Archaic stage to the Late Prehistoric stage in eastern Colorado was characterized by changes in technology, economy, settlement patterns, and social structures. These changes are likely related to a significant increase in population that began at the end of the Late Archaic period and peaked in the middle of the Early Ceramic period. The sense of place based on a larger territorial scale instead of at the site level was in part an outgrowth of the need for greater control of territory when population pressures resulted in greater competition for critical resources within constrained territories, which in turn contributed to a redefinition of community identity and territorial ties. Many of the changes in mortuary practice correlate to similar changes in Plains Woodland burial rituals on the Central Plains, where they also created and reinforced a larger and more integrated sense of community. Likewise, similarities in the nature and use of burial accompaniments, the appearance of secondary burials, and the topographic positioning of burial sites suggest not only communication but also a shared ideology with communities to the east.

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