THREE

Making Places: Burned Rock Middens, Feasting, and Changing Land Use in the Upper Arkansas River Basin

Mark D. Mitchell

RESEARCH ON THE RELATIONSHIPS between human groups and the places they inhabit has a long history in American archaeology. In the 1930s and 1940s, scholars working in the Great Plains, the Southwest, and the Great Basin began to investigate the interactions between culture and the environment (e.g., Steward 1938; Wedel 1953). By the close of the 1960s, the study of human ecology, often conducted by interdisciplinary teams, had become an important aspect of archaeological research throughout the Americas.

An integrated landscape approach emerged in the 1970s, as archaeologists began to recognize the importance of understanding activities taking place away from residential settlements. This approach encouraged scholars to combine and compare disparate lines of evidence, including data on the organization of technology; on the location, structure, and size of residential sites; on the form and permanence of residential architecture; and on the occupational

or life histories of sites and features (Wandsnider 1992). More recently, the increasingly widespread use of remote sensing data (Kvamme 2003) and Geographic Information Systems has greatly amplified the power of archaeological landscape analyses.

As landscape research has progressed, many scholars have come to recognize that land use strategies are affected as much by the meanings and values people assign to the places where they live as they are by the physical properties of the environment (Ashmore 2002; Ashmore and Knapp 1999; Basso 1996; Bender 1993; Gosden 1994; Hirsch and O'Hanlon 1995; Ingold 1993, 2000; Lemaire 1997; Thomas 1996; Tilley 1994; Ucko and Layton 1999). Proponents of this view argue that the landscape is more than simply a neutral backdrop for human activity. It is also experienced and interpreted by the people who inhabit it, and those experiences and interpretations guide the ways it is used. The cultural "decisions and dispositions" governing mobility strategies, resource exploitation patterns, or the design and placement of constructed features reflect shared ways of seeing the land, which in turn reflect the social relations and material practices through which resources are appropriated (Ashmore 2002:1172; Cosgrove 1998; Pred 1984). Explanations for changing land use strategies must therefore focus not only on the material settings in which human action takes place but also on the cultural practices through which human groups create resources.

In this chapter, I explore the implications of this new approach for interpreting hunter-gatherer land use in the upper Arkansas River Basin in southeastern Colorado (Figure 3.1). To do so, I focus on the life histories or biographies of one prominent class of food-processing facilities. I argue that these features, known archaeologically as burned rock middens, played important roles in shaping land use and mobility patterns in the region, not because of their spatial relationships to particular plant and animal communities but because they marked socially valued places. I frame the discussion by first briefly considering the historical roots of functional landscape analysis. I then sketch the outlines of the social landscape approach. Finally, I compare and contrast interpretations of southeastern Colorado's burned rock middens derived from each of these models, concluding that an understanding of the history of human engagement with place is critical for explaining changing mobility strategies.

DECONSTRUCTING THE ENVIRONMENT

At least since the 1960s, hunter-gatherer subsistence practices and settlement systems have been explained as adaptations to the physical properties of the

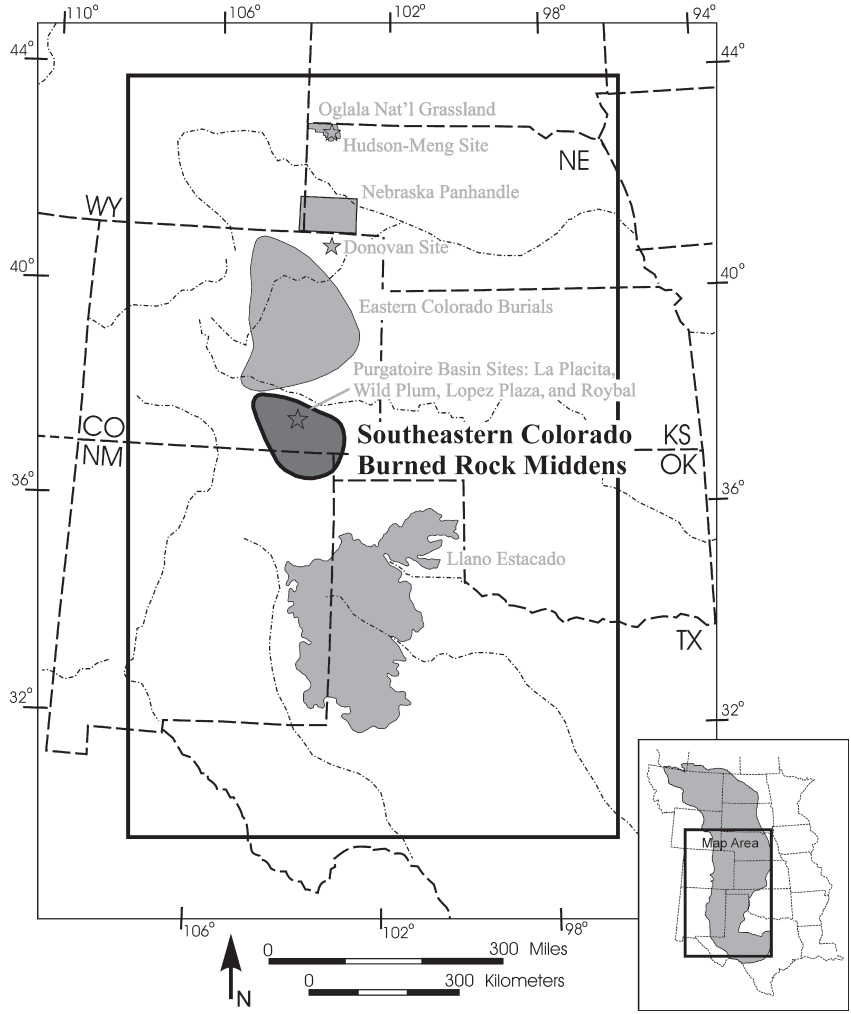

FIGURE 3.1.
Map of the High Plains, highlighting southern Colorado burned rock middens. Illustration by Kevin Gilmore.

environment (Bettinger 1991; Kelly 1995; Winterhalder and Smith 1981). In this view, the organization of production is determined by environmental variables, including the location, density, or predictability of resources (Winterhalder 2001). Decisions about where to live and how to move across the landscape can be explained by relating them to the properties of the environment (Binford 1980) and secondarily to the land use decisions made by competing groups

(Cashdan 1992). As records of those decisions, the design, placement, and life histories of constructed features are believed to reflect long-term environmental trends (Binford 1982).

Critical to this functional approach is an ontological distinction between the landscape, defined as an arrangement of resources whose distributions are governed by natural processes that can be objectively described and measured, and the human actions through which those resources are exploited. Because the structure of the natural world explains the organization of the cultural worlds of the people who inhabit it, nature and culture must constitute distinct and separable domains. It must be possible, for example, to define resources without reference to the cultural functions they fulfill. It must be possible to view the land as if it were unsettled, empty, unpopulated. Nature must be an object that can be perceived directly.

The genealogy of this view of landscape, as ontologically distinct from human culture, can be traced at least to the 1400s (Cosgrove 1998; Gosden and Head 1994; Hirsch 1995; Knapp and Ashmore 1999; Lemaire 1997; Tilley 1994). The emergence of the natural world as a distinct object of study was first reflected in Renaissance pictorial and cartographic techniques designed to set the landscape apart from human observers. Drawing on Euclidean geometry (Cosgrove 1988), European artists during the fifteenth century began experimenting with linear perspective. By creating the illusion of three-dimensional space, perspective establishes a literal and metaphorical point of view and, implicitly, a viewer located outside the scene. The emergence of modern cartographic techniques at about the same time helped solidify the partition between nature and culture by replacing descriptions of the land in terms of routes or other sequences of human action with descriptions rooted in the abstract principles of distance and arrangement (Certeau 1984:120). These new conceptual systems were encouraged by the simultaneous invention of new technologies for seeing, including the telescope, the camera obscura, and the microscope (Cosgrove 1998). Over time, these methods and technologies firmly established the division between an active, cultural observer and the passive, natural landscape (Bender 1999). They became ways of perceiving the world that encoded particular ideas about the relationship between nature and culture, ideas that made possible the notion of abstract nature—existing outside human action—separated from an autonomous, disengaged observer (Barrett 1999a:22; Tilley 1994).

The recognition that the functional approach to landscape is predicated on a particular way of representing the land, one that can be traced to a particular cultural and historical setting, has led many scholars to question whether

it can be applied to the study of the ways non-Western peoples perceive and use their land (Bender 1993, 1999, 2002; Head 1993; Hirsch 1995; Johnston 1998a; Knapp and Ashmore 1999; Lemaire 1997; Tilley 1994; Ucko and Layton 1999). But rejecting the universality of functional analysis does not entail accepting a definition of landscape only in terms of perception and experience. In fact, such a definition threatens simply to replace the "naturalistic fallacy" of functional models—the notion that the landscape is nothing more than a passive substrate—with the "culturalistic fallacy" that the landscape is nothing more than a social construct (Lemaire 1997:11; see also Johnston 1998b). However, a closer look at the history of Western landscape representation points up an altogether different approach.

The objectification of nature expressed in early modern landscape painting, map making, and other disciplines was critically important to the growth of capitalism in Europe (Cosgrove 1998; Lemaire 1997:6–7). Capitalism fundamentally altered the ways Europeans both used and perceived the land. The development of markets for buying and selling property necessitated new systems for describing and recording locations. New technologies affected the nature and scale of resource extraction. Changes in the organization of production transformed people's connections to places. Thus, the new modes of representation arose with and facilitated a new mode of appropriation. Capitalism remade the ways Europeans used the land, prompting new ways of seeing the land. In turn, the objectification of nature helped make the expansion of capitalism possible. In short, perceptions of the environment are bound recursively to the appropriation of resources.

Archaeologists can reconcile the fact that people perceive their environment in culturally conditioned ways—and act on the basis of those perceptions—with the ineluctable materiality of the world by abandoning an analytic approach that treats nature and culture as discrete and separable domains (Ingold 2000:58–60). Instead, landscape should be understood and analyzed as a synthesis of the world's physicality and the human meanings with which it is permeated (Lemaire 1997). Landscape is not equivalent to the environment, nor is it merely an imaginative representation of the environment. Rather, it can be defined in terms of spatially differentiated social practices, which structure, and are in turn structured by, physical spaces and natural materials (Ingold 1993). Landscape emerges from the acts of appropriation or dwelling. It is not simply a matter of different perceptions of the world but of different ways of acting in the world. In short, landscape is neither culture nor nature but "the material manifestation of the relationship between humans and the environment" (Crumley 1994:6; see also Fisher and Feinman 2005).

CONSTRUCTING THE SOCIAL LANDSCAPE

Two important avenues for research are opened up by the view that landscape comes into being through human occupancy and appropriation. Since the early 1990s, archaeologists increasingly have come to appreciate the role played by human action in shaping the earth's ecosystems and have realized that ecological change cannot be understood apart from changing cultural practices and perceptions (Barnes and Williamson 2006; Delcourt and Delcourt 2004; Denevan 1992; van der Leeuw and Redman 2002). At the same time, the social landscape approach has stimulated research on the ways symbolic systems and social relations affect land use decisions (Gosden and Head 1994; Pauketat 2001; Tilley 1994). In the following paragraphs I outline some of the major features of the latter work.

In making their living, all human groups engage the land. They draw from it the materials necessary to sustain themselves biologically, socially, and culturally. But the transformation of materials into resources for the satisfaction of human needs is a cultural act. That is, resources are brought into being by processes of extraction and manipulation carried out by individuals and groups that have defined relationships with one another and that hold particular beliefs about the world in which they live. Moreover, these processes employ particular kinds of technologies, which themselves require particular organizational modes and skills to operate. Materials become "social utilities," resources necessary for the fulfillment of individual physiological needs as well as the reproductive requirements of social life, in ways dictated by the forces and relations of production (Godelier 1979) and by cultural systems of value. For this reason, resources cannot be defined without reference to technological practices, social relations, and symbolic systems.

The land acquires social and symbolic value in the same way. The livelihood of a group entails the performance of a variety of productive tasks. Each task derives its significance and meaning from the "taskscape," the aggregate of tasks carried out by the group (Ingold 1993:158). To the extent that the taskscape is distributed across the land, the landscape becomes its material manifestation, its "congealed form" (Ingold 1993:162). Because the landscape comprises resources brought into being by extractive acts or tasks structured by social rules, then it must also embody social relations and cultural meanings. This is what is meant by the "socialization" of the landscape, the cumulative impact of human action distributed over the land (Bradley 1993; Tacon 1994).

Thus, landscape is not simply a passive arrangement of objectively defined resources, a Cartesian terrain that exists outside human action. Rather, it comprises an array of interlocking places, created through social practice, that

exhibit varying degrees of economic, social, and ideational potential. Places become significant for social reproduction by virtue of their relationships to materials, people, and the cosmos. The potential of a place can therefore be defined in terms of technologies, the relations of production, and cultural values.

This reproductive potential emerges over time from sequences of action that are structured as much by prior social action as by the physical properties of locations and materials (Bender 2002; Gosden and Head 1994; Ingold 1993). Three temporal scales can be identified in the analysis of social landscapes. The smallest scale reflects local experience and individual learning, where observation and repetition combine to produce routine social action (Shennan 1993). Such practices range from habitual bodily movements (Bourdieu 1977; Mauss 1973 [1935]) to the complex practical competencies that make everyday life possible. Such routine activities, both sacred and secular, are carried out within the spatial and temporal limits of individual lives. At this scale, the appropriateness of particular social practices is often taken for granted or "misrecognized" as natural; however, in some cases, particularly during periods of social disruption, they may become objects of conscious scrutiny (Bourdieu 1977; Giddens 1979).

At a somewhat larger scale, landscapes can be understood in terms of social memory. Memory situates the routine actions of daily life within broader cultural contexts, thereby locating social action within a wider field of "mythic and moral principles" (Knapp and Ashmore 1999:13; Van Dyke and Alcock 2003). Individuals locate personal memories within specific places and with specific objects that embody shared social meanings. Social memory maintains continuities of practice that bridge generational divisions and transcend local places. At this scale, landscapes are a subject of discourse, as people make meaningful connections between places and the systems and structures they embody. Public ritual events are one important context through which connections are made between places on the landscape and valued meanings and social relationships. Sacred and secular rituals and the places in which they are performed reproduce one another (Connerton 1989).

Landscapes can also be understood in terms of persistent cultural traditions, which reflect both long-term ecological processes and the symbolic meanings given to human action (Duke 1991). This largest scale is perhaps most familiar to archaeologists because it most clearly reveals the long-term organizational principles that structure the creation of places. Large-scale structure results from interactions between the physical constraints of locations and materials and the dominant mode of production that transforms them into resources.

Such constraints and organizational principles are instantiated in action even as they form the context for future action.

Because the landscape can be equated with the content and structure of social action through time, it can be explained in relation not only to the physical arrangements of locations and materials but also to the processes of social appropriation. To illustrate how this definition of the social landscape can be used to explain the life histories of archaeological features, I now turn to data on land use in the upper Arkansas River Basin and on the life histories of burned rock middens.

LAND USE PATTERNS IN THE UPPER ARKANSAS RIVER BASIN

Between 3000 B.P. and 500 B.P., people living in southeastern Colorado pursued a dynamic, broad-based hunting-and-gathering subsistence strategy (Kalasz, Mitchell, and Zier 1999; Zier 1999). Although the makeup of faunal and macro-floral assemblages varies somewhat from place to place, the subsistence system appears to have been remarkably stable throughout this long period, and no evidence suggests that particular groups pursued exclusive procurement strategies. Maize first became available in small quantities about 2,600 years ago (Zier 1999:137), but while the dietary importance of maize and other cultigens likely increased after about 1800 B.P., it never exceeded that of meat and gathered plants.

However, during this period, distinct changes did take place in the ways people used the landscape. During the Late Archaic period (3000 B.P.–1850 B.P.), human groups exploited all of the region's diverse ecological zones, from mountain valleys to open steppes to deep canyons (Zier 1999:132). A few sites, particularly those located in large rock shelters, appear to have been occupied repeatedly and may have served as base camps at which a comparatively wide range of activities were carried out (Zier 1999:133). Nevertheless, most Late Archaic sites appear to have been occupied briefly.

Features dating to this period consist almost exclusively of burned rock concentrations ranging up to about 1.5 m in diameter. These features were likely used for a variety of tasks. Small, rock-filled basins up to 50 cm in diameter and 25 cm deep are especially common. Deeper, steep-sided, slab-lined basins have also been recorded, as have surface concentrations of fire-cracked rock; some of the latter may represent secondary deposits resulting from hearth cleaning (Zier 1999:135).

No unequivocal Late Archaic storage features have been documented in the region (Zier 1999:135). Only one habitation structure (a shallow house pit

with a ramp entryway) has been recorded (Shields 1980). Although this feature has been interpreted as part of a "village," no other habitation features have been recorded at the site, and no other similar features have been attributed to the Late Archaic elsewhere in the region (Zier 1999:134).

These data, especially the near absence of storage features and substantial habitation structures, indicate that during the Late Archaic, residential mobility was relatively high. Little investment was made in the construction of facilities. Some sites were periodically reoccupied, but sites in different ecological zones often contain functionally comparable assemblages.

This long-standing pattern began to shift during the subsequent Developmental period (1850 B.P.–900 B.P.). About 1,500 years ago, hunter-gatherer groups began building single-room, semi-subterranean stone and brush shelters in open settings and rock walls or partitions in rock shelters (Kalasz, Mitchell, and Zier 1999). The freestanding structures, which are typically circular in plan and range in diameter from about 3.5 to about 8 m, are found mostly on canyon rims. Partitioned rock shelters vary greatly in size, although most are low and shallow. Small storage features, consisting of bell-shaped pits or rock-lined cists, are frequently associated with these structures.

Like their Late Archaic predecessors, Developmental-period hunter-gatherers exploited a wide variety of environmental settings. But Developmental-period artifact assemblages and feature types are more variable, suggesting greater task differentiation and greater variation in occupation duration (Kalasz, Mitchell, and Zier 1999:175). Rock shelter sites and open sites lacking architectural features exhibit a wide range of attributes. Architectural sites are comparatively uncommon, but those that are known differ from one another in important ways. Many small sites appear to have been used for specialized plant-processing tasks.

These trends continued during the Diversification period (900 B.P.–500 B.P.). Architectural features became larger and more complex, and storage features became more numerous. Structures containing up to ten rooms were built in some locations (Gunnerson 1989). Some rooms or partitioned spaces were probably used for communal activities, while others may have served as storage facilities. The sizes and forms of both architectural and non-architectural features vary across the region, suggesting that different groups pursued distinct economic strategies. Maize is present on some sites, but as previously noted the overall contribution of cultigens to the diet was limited. Macrofloral data attest to the importance of gathered plants, especially goosefoot (*Chenopodium*). Most faunal assemblages are dominated by deer and cottontail,

although significant variation is evident between open sites and rock shelters (Kalasz, Mitchell, and Zier 1999).

These data indicate that residential mobility began to decrease after 1500 B.P., likely reaching a minimum at the end of the Diversification period, about 500 years ago. During this period, hunting-and-gathering groups made greater investments in the construction of domestic structures and storage facilities, suggesting that certain localities were used more frequently and perhaps for longer periods. The simultaneous increase in assemblage diversity indicates that as residential mobility decreased, the spatial segregation of productive tasks increased, with some activities restricted to particular settings. Especially after 750 B.P., the settlement system may have incorporated brief periods of population aggregation. Nevertheless, the absence of extensive accumulations of cultural debris indicates that most sites and structures were occupied intermittently. The sporadic occurrence of cultigens, along with the lack of agricultural tools and the frequent placement of habitation structures away from arable land, supports the view that hunting and gathering, involving some degree of residential mobility, remained the primary subsistence strategy throughout the period.

BURNED ROCK MIDDENS

Along with stone and brush enclosures and storage features, large burned rock middens also first appeared during the Developmental period. These features differ in both size and content from simple domestic hearths and plant-processing features (Table 3.1). Each consists of an exceptionally dense and compact accumulation of burned and fractured rock. Most are circular or slightly elliptical in plan, with well-defined margins. Two forms have been documented: mounded or dome-shaped, which is the most common, and annular or ring-shaped. Excavated middens range from just over 3 m to 12 m in diameter. The rocks comprising the middens range in size from large slabs and blocks to irregular cobbles and pebbles. Some of the largest stones are flat-lying, but most are randomly oriented and tightly interlocking (Figure 3.2). The extent of heat alteration varies among stones. In most middens the matrix is black because of the presence of abundant, finely divided charcoal. All of the middens for which there are data were built in shallow pits.

Unlike hearths and other small burned rock features, which typically contain few artifacts, southeastern Colorado's burned rock middens contain large and diverse artifact assemblages (Kalasz 1990; Mitchell 2001). Both burned and unburned flaking debris is abundant, as are chipped stone tools and tool

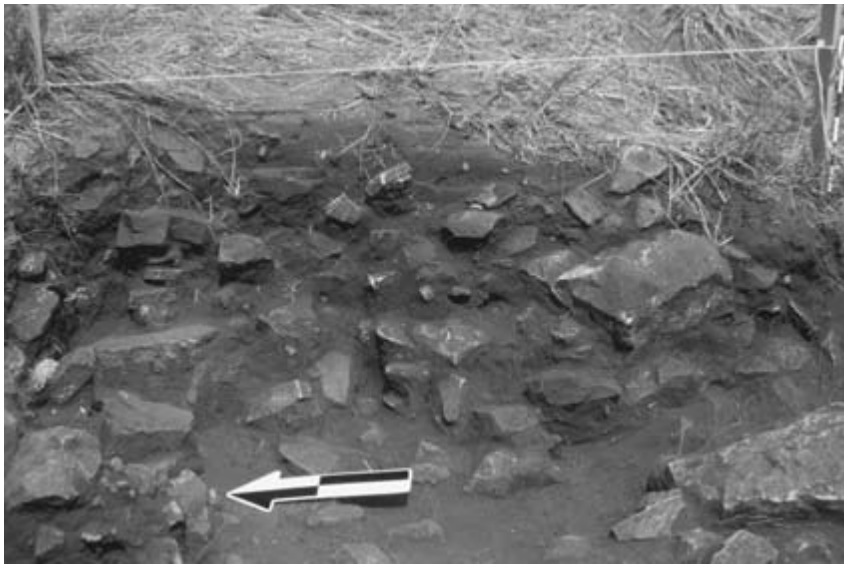

FIGURE 3.2.
The large burned rock midden at 5LA5840.

fragments. Groundstone tools, including handstones, millingstones, and enigmatic multifunction abraders, are common. Pottery is typically present. Decorative items, including shell and bone beads, occur frequently. Charred botanical remains are present in most middens, but faunal remains are notably rare or absent. Artifacts are generally more abundant in middens than they are in nearby contemporaneous cultural deposits.

Although widely distributed, large burned rock middens are relatively uncommon in the upper Arkansas River Basin. In one extensively surveyed part of the basin, just 1.5 percent of recorded fire-related features (11 of 733) fall into the largest size class (32 to 53 m^2) (Kalasz 1999:XII-79). Most middens are located on high terraces in canyons, but they also occur on canyon rims, mesa tops, and steppes. Many are located adjacent to clusters of domestic architectural features, in what can be interpreted as small plazas or communal work areas (Figure 3.3). Generally, in such cases only one midden is present. All of the excavated middens were constructed between about 1870 B.P. and 515 B.P., although most of the associated dates fall between 1220 B.P. and 855 B.P.

The functions of burned rock accumulations such as these have long been debated (Black 1997; Collins 1994). From the beginning, it has been assumed

Table 3.1. Data on Excavated Burned Rock Middens in the Upper Arkansas River Basin.

Site and Feature	*Max. Diameter (m)*	*^{14}C Age(s) (B.P.)*	*Relative Artifact Density*	*Reference*
5LA2169	9	1130±65 1220±50 1220±65	Moderately abundant	Nowak and Jones (1984)
5BA320, Hearth B	7	900±60	Abundant; some bone	Nowak and Jones (1986)
5BA346, Feature 2	3.2	890±60	Abundant	Nowak and Jones (1985, 1986)
5HF289	5	870±50	Moderately abundant; little bone	Chenault (1982)
5LA5840, RS 1	12	855±50 1110±50	Abundant; little bone	Mitchell (2001)
5BA320, Hearth A	6	630±50 1870±70	Abundant	Nowak and Jones (1985)
5LA1045	9.4	515±65	Moderately abundant; little bone	Greer (1966)

that they are palimpsests, representing one or more activities carried out repeatedly in the same location over an extended period of time. Some scholars have argued that they represent the amalgamation of comparatively small, discrete hearths. Others have viewed them as communal dumps for burned rock and other debris removed from primary domestic contexts. However, research conducted since the late 1980s in central Texas and elsewhere has demonstrated that many such compact accumulations of burned rock represent the remains of recurrently used earth ovens (e.g., Black et al. 1997).

Earth oven food processing uses the thermal inertia of heated stones to cook a variety of foods, especially plants rich in complex polysaccharides and meats rich in fat (Wandsnider 1997). These foods require relatively long cooking times at relatively high temperatures; both of these conditions can be achieved in an earth oven. Typically, an oven consists of a shallow pit lined with cobbles or slabs (Ellis 1997). The oven is fired, after which charcoal and unburned wood are removed. Food items are wrapped or covered to protect them from scorching, placed in the pit, and covered with more stones and earth. When cooking is complete, the oven is opened by removing the covering layer or lid. The repeated use and periodic reconstruction of the oven result in a progressive accumulation of burned, fractured rocks, as well as tools and debris related to food preparation, which are deposited in a symmetrical toss

FIGURE 3.3.
A burned rock midden, approximately 4 m in diameter. Note circular stone enclosure located immediately behind the midden.

zone. The resulting burned rock midden is therefore not a structureless accumulation but rather a "center-focused cooking facility," the size of which is a function of its duration of use or life history (Black 1997:85).[1]

Problem-oriented research designed to determine the functions of southeastern Colorado's large burned rock middens has yet to be undertaken. However, data from two recently excavated features bolster the inference that the large, compact accumulations of burned rock described in this chapter represent the remains of earth ovens. The clearest evidence comes from 5LA3186 (Kalasz et al. 2007). There, excavation revealed the presence of two superimposed slab-lined basins, surrounded by a scatter of burned rock several meters in diameter. The slabs forming each of the basins or heating beds fit tightly together, and some of the stones comprising the lower basin were later incorporated into the upper basin. A well-developed oxidation rind is present beneath the feature, which dates to the late Developmental and early Diversification periods. A similar arrangement was observed at 5OT430, a Late Archaic site where a shallow basin hearth surrounded by a burned rock scatter 3 m in

diameter was superimposed directly over an earlier, smaller accumulation of rock (Mueller, Zier, and Brown 1994). Interestingly, the earlier feature had been buried under 24 cm of nearly sterile sediment prior to construction of the later feature.

However, significant differences also exist between the features observed at 5LA3186 and 5OT430 and the region's large burned rock middens, indicating that they may have been used in different ways. All of the excavated middens contain abundant plant remains, but in the features at 5LA3186 and 5OT430 charred plant parts are virtually absent. The vagaries of preservation may play a role in this difference, but it also seems likely that different food preparation methods were used, perhaps involving different types of foods. Artifacts, too, are nearly absent from the burned rock accumulations at 5LA3186 and 5OT430. By contrast, excavated middens contain numerous artifacts, including tools and debris not directly related to food preparation. This suggests that, in addition to food preparation and cooking, a comparatively wide range of activities was carried out adjacent to large middens (Collins 1994).

It is not clear what types of foods were prepared in southeastern Colorado's burned rock middens. None of the plants commonly associated with earth oven cooking, such as camas (*Camassia* sp.), agave (*Agave* sp.), and sotol (*Dasylirion* sp.), currently grows in the upper Arkansas River Basin. However, at least three species (yucca [*Yucca glauca*], cholla [*Opuntia imbricate*], and prickly pear [*Opuntia* sp.]) known from ethnographic and historical accounts to have been processed in earth ovens do grow in the region. In addition, there are tubers such as bush morning glory (*Ipomoea leptophylla*) that exhibit compositional characteristics similar to those known to have been processed in earth ovens (Mitchell 2001). *Ipomoea* roots are processed by the Alyawara in similar roasting pits (O'Connell, Latz, and Barnett 1983).

The plant parts most frequently recovered from burned rock middens in southeastern Colorado are goosefoot seeds. In some cases, goosefoot leaves may have been consumed directly, but they may also have been wrapped around meats or tubers to prevent scorching. Other genera represented in midden deposits include *Amaranthus* (amaranth), *Portulaca* (purslane), and *Echinocereus* (hedgehog-type cactus). Starch granules present in at least one midden may derive from either *Zea* (maize) or *Ipomoea* (Puseman and Cummings 2001), both of which likely were relatively minor dietary components owing to their sparse, uneven distributions. Animal bones are absent or uncommon in all of the upper Arkansas River Basin middens for which excavation data are available. If meat was cooked in southeastern Colorado's middens, then butchery must have taken place elsewhere.

Taken together, these data suggest that southeastern Colorado's large burned rock middens were used by momentarily aggregated groups for preparing special foods. Ethnographic accounts often associate earth oven cooking with supra-household food preparation and consumption (Wandsnider 1997), and the archaeological data presented here suggest that middens represent persistent locations of communal activity. Many are situated in open areas adjacent to clusters of intermittently occupied habitation structures. The size and diversity of the associated artifact assemblages indicate that a wide variety of tasks were carried out there, concomitant with food preparation. Given the diversity of tool types present, it seems likely that family groups, rather than specialized task groups, used them. Limited macro-botanical data suggest that they were used differently than hearths or other small accumulations of burned rock.

CLIMATE AND BURNED ROCK MIDDENS

How well does the functional approach to landscape explain the life histories of large burned rock middens? Functional models predict that the structure and distribution of archaeological features will mirror the structure and distribution of the resources they were created to utilize or the materials from which they were constructed (Dewar and McBride 1992; Smith and McNees 1999). In this view, the location and form of Arkansas Basin middens were determined by the locations and densities of particular kinds of foods, which in turn are affected by climate, topography, soils, and so forth.

In a semiarid region like southeastern Colorado, the abundance and distribution of many plant and animal species vary significantly both spatially and temporally. Such patchiness is a product of both synchronic and diachronic variation in temperature and precipitation. Modern meteorological records hint at the magnitude of this variation. For example, during an eighty-year period-of-record for Rocky Ford, Colorado, annual precipitation varied between 5.9 inches and 22.4 inches (Siemer 1977). Similarly, in 1998, a total of 26.3 inches of rain fell at the Campo 7S weather station in southern Baca County, while during the same period only 14.8 inches fell at the town of Stonington, just 25 miles (40 km) away.

Paleoenvironmental data, although sparse, suggest that similarly variable, patchy conditions prevailed in the past. Most climatic reconstructions suggest that approximately modern rainfall and temperature regimes were in place at the end of the Altithermal. Essentially modern floral and faunal assemblages have been recovered from both Middle Archaic (5000 B.P.–3000 B.P.) and Late Archaic rock shelters (Hand and Jepson 1996; Zier and Kalasz 1991).

During the Developmental period, eastern Colorado may have been somewhat cooler and wetter than at present, but the departures from current conditions are not thought to have been dramatic (Painter et al. 1999).

Stochastic fluctuations in temperature and precipitation affect the diversity and abundance of available plant and animal species. Even minor variations in the timing of precipitation can affect the species composition of particular patches. For mobile human populations, the resulting instability and unpredictability can prevent the establishment of a routine annual subsistence round in which particular places are used repeatedly for particular purposes. Under such circumstances, functional models predict that resource-processing features will be widely distributed across the landscape, particularly if they are inexpensive to build. Most burned rock features should be relatively small, reflecting the small likelihood that any given feature could be profitably reused. Even comparatively minor variations in the abundance of key species should result in a relatively unstructured arrangement of features. This is particularly true in open settings (Wandsnider 1998).

Although this model likely explains the form and wide distribution of the region's small burned rock features, it does little to explain the life histories of large burned rock middens. On the contrary, their compact, sharply defined morphology, a product of the complete spatial congruence of specific activities carried out periodically over an extended period of time (Dewar and McBride 1992), suggests that the decision to reuse them was made despite environmental instability. Their life history is particularly striking if it is the case that they were built to process widely and unevenly distributed resources, such as *Ipomoea* tubers, or low-yield resources such as sotol (Dering 1999).

The decision to reuse a burned rock midden likely was not dictated by the costs of building and operating them. Earth ovens are simple to construct. The necessary materials would always have been available within or immediately adjacent to a productive resource patch. Stones for the heating bed and cobble covering could be obtained on-site. The fuel consisted of common trees and shrubs such as juniper (*Juniperus* sp.), rabbitbrush (*Chrysothamnus nauseosus*), and four-wing saltbush (*Atriplex canescens*) (Puseman and Cummings 2001). Considerable effort was likely needed to gather sufficient fuel (Dering 1999), but the labor required would not have been diminished by reusing an existing facility. In fact, much of the effort involved in earth oven cooking is spent on harvesting, transporting, and processing food items; it is difficult to imagine that the perhaps slightly lower cost of reusing an existing oven would have offset the cost of transporting food items from distant patches. Moreover, reuse of a particular locality could entail costs that increased with the number of

site visits. Superimposition of activity areas can lead to a buildup of domestic debris, which in turn can attract a variety of undesirable pests (Wandsnider 1992). Depletion of fuel resources could increase the time and effort needed to obtain them.

The contrasts between the morphological expectations derived from functional landscape analysis and data on burned rock middens in the upper Arkansas River Basin suggest that factors other than climatic conditions or the distributions of plant and animal species must be invoked to explain their life histories. As the social landscape model suggests, one of the most important factors is the history of human engagement with the land.

FEASTING AND BURNED ROCK MIDDENS

Dedicated settings for communal social activity, whether natural or constructed, are crucial for human social and biological reproduction. In such places, social relations are enacted and reenacted, establishing and maintaining relationships among people and between people and the cosmos (Barrett 1999b). Ceremonial or ritual events are often the most important social practices linking people to places and to each other (Spielmann 2002). Ritual events provide a context for sustaining connections between individuals and groups and for negotiating social identity and status. Communal ceremonies also connect social groups to particular places by directly linking the processes of social reproduction to particular landscape features or constructed facilities. Over time, the places where such ceremonies occur take on the social and symbolic meanings those ceremonies are meant to invoke, providing a focal point for shared memories (Connerton 1989). Indeed, it is partly through ceremonial practice that the social landscape comes into being.

Supra-household food preparation and consumption often accompany communal ceremonial events (Dietler 1996; Hayden 2001; Joyce in press; Wills and Crown 2004). Such ceremonial meals or feasts often feature special foods that are rare, difficult to procure, and laborious to prepare (Hayden 1996). Specialized tools, such as oversized cooking and serving vessels, and specialized features, such as large earth ovens (Hayden 1996:138), are frequently used in the preparation of ceremonial meals. Feasts are often carried out inside special structures or in suitably large public spaces. Ceremonial or ritual meals may involve the preparation of large quantities of food, resulting in the formation of unusual archaeological deposits (Wills and Crown 2004).

Recently, considerable attention has been paid to the connections between feasting and social power (e.g., Clark and Blake 1994; Dietler 2001; Phillips

and Sebastian 2004). Many scholars have argued that feasts are "political tools," by which status-seeking individuals or groups build and reinforce social relationships based on debt (Dietler 1996:87). Such competitive feasting, along with associated communal ritual activities, provides a venue for aggrandizing individuals to amass status and political power. However, supra-household food consumption need not entail the creation of obligation; nor is status differentiation the principal axis around which feasting necessarily revolves (Potter 2000; Potter and Ortman 2004; Spielmann 2002). Feasts are also a venue for the "symbolic representation of social relations" (Dietler 1996:89). Such "minimally distinctive" feasts serve to negotiate and reaffirm social relationships among people (Hayden 2001). They can establish and maintain group cohesion, build cooperative alliances between disparate social groups, mobilize communal labor, or compensate for social transgressions. Although feasts may have been less common among some hunting-and-gathering groups than among food-producing groups, they nevertheless may have played a role in promoting social solidarity (Hayden 2001), redistributing food or other items, and enhancing group prestige (Lindauer 2000).

Although research on southeastern Colorado's burned rock middens is just beginning, the data discussed previously suggest that they were hubs of communal activity. The diversity of the artifacts associated with them indicates that they were associated with a wide variety of concurrent tasks. Given the ethnographically documented uses of earth oven cookery, it is likely that several households cooperated in procuring and processing the food items prepared in them. Macro-botanical data suggest that those items could have included maize, which would have been rare and perhaps highly valued, and bush morning glory, which is difficult to procure and prepare (Mitchell 2001). Large burned rock middens are also frequently located in what can be interpreted as public spaces adjacent to clusters of small domestic structures.

Thus, the compact structure of these features, a material expression of their unique life histories, reflects the intimate connections between them and the social purposes they served. Through repeated use, large burned rock middens became associated with the productive and reproductive functions of communal food preparation and related activities. This was a historical process. As the number of uses increased, the power of these places to invoke particular social relations and cultural meanings also increased. Over time, these features became the spatial embodiment of the social relations they were built to enact and sustain, perhaps including relations of debt. Their potential to reproduce the social or cosmological order lay not in their proximity to economic resources but in the values they epitomized and the social bonds they created.

BURNED ROCK MIDDENS AND CHANGING MOBILITY PATTERNS

In the upper Arkansas River Basin, the appearance of the earliest large burned rock middens coincided with the beginning of a gradual reduction in residential mobility and a correlated increase in the spatial segregation of productive tasks. Paleoenvironmental data indicate that these processes, as well as the broader technological changes defining the Developmental period (ceramics and the bow and arrow), were not accompanied by directional changes in climate. The end of the Late Archaic period and the beginning of the Developmental period may have been somewhat wetter than at present, but the transition itself did not coincide with a climatic shift (Hall 1982; Zier and Kalasz 1991; but see Butler 1992 for evidence of regional variability). Instead, the interpretations discussed in this chapter suggest that these changes were bound up recursively with changes in the ways people conceptualized and engaged with the land. The construction and use of earth ovens, perhaps during a period of relative resource abundance (Wills and Crown 2004:156), initiated the sedimentation of social and symbolic meanings and potentials onto specific, restricted portions of the landscape. Through repeated communal inhabitation, these places became socially valuable. In turn, a desire to sustain and elaborate the social meanings those places engendered encouraged repeated use. Burned rock middens, therefore, mark socially and symbolically important places. The fact that they first appeared in the absence of directional climatic change suggests that the fixation of social or ideational meanings may have initiated, rather than simply reflected, the trend toward decreased residential mobility. Thus, periodic feasting and the growing social value of particular places may have contributed to long-term changes in the relations and organization of production.

It is not clear whether the periodic population aggregation that marked the end of the Developmental period and the Diversification period was accompanied by population increases. No evidence suggests that people moved into the region from elsewhere during the Developmental period (Kalasz, Mitchell, and Zier 1999:171). The large number of architectural sites dated to the Diversification period may reflect population increases, but the distribution of such sites is rather patchy (Kalasz, Mitchell, and Zier 1999:191). Moreover, despite modest increases in the use of cultigens, subsistence practices appear to have been relatively stable throughout this period. In any case, even if regional population increases took place, they postdate the first appearance and initial growth of many of the region's large burned rock middens.

MAKING PLACES: CONSTRUCTING SOCIETY, CONSTRUCTING THE LANDSCAPE

Significant places cannot be defined solely in terms of abstract distributions of natural resources. Rather, places are "mediations" between the physical properties of the land and the processes of human occupancy (Lemaire 1997:11). Social landscapes are made up of resources brought into being by social action. Over time, the landscape comes to embody productive practices and as a consequence the social order responsible for those practices. In a very real sense, the landscape as occupied is the material manifestation of rights to resources and relationships among social actors. However, the landscape is not merely a reflection of such relationships; it is constitutive of them. The land both structures and is structured by the everyday practices of dwelling or inhabitation (Bourdieu 1977; Certeau 1984; Fisher and Feinman 2005; Giddens 1984; Ingold 2000).

Socialized landscapes embody history. Traces of human action accumulate over time, in the manipulation of plant and animal communities (Barnes and Williamson 2006), the placement of symbols and signs (Tacon 1994), the construction of features (Bradley 1993), and the habitual use of paths and spaces (Robin 2002). In these ways, the landscape is shaped by long-term cultural processes. In turn, the landscape as inhabited enables and constrains further action. Neither the physical properties of the land nor the structure of human settlement systems can be explained without an understanding of the history of human extractive practices. For this reason, research on the life histories of places is critical to the study of landscape (Ashmore 2002; Wandsnider 1992).

The development of a recursive, historical view of landscape has been stimulated by the recognition that "the natural world" is a recent invention. But the dwelling perspective applied in this chapter moves analysis far beyond a simple dichotomy between Western and non-Western ways of perceiving and experiencing the world. Rather, it is the foundation of a comprehensive human ecology capable of integrating the study of human cultural practices and the study of environmental change (Crumley 1994; Fisher and Feinman 2005; Ingold 2000; McGlade 1995; van der Leeuw and Redman 2002). The recognition that landscape and society are mutually constitutive provides a more complete understanding of the factors affecting both environmental change and human land use decisions. In the case at hand, the social landscape approach explains the life histories of southeastern Colorado's burned rock middens more fully than the functional approach.

The recognition that the history of human engagement with the land can affect patterns of sedentism and mobility has direct implications for under-

standing change and continuity in hunter-gatherer settlement systems. By focusing on the ways people inhabit their surroundings over long periods of time and on the critical role social relations play in determining mobility strategies, archaeology can make important contributions to a new human ecology.

ACKNOWLEDGMENTS

I thank Laura Scheiber and Bonnie Clark for the opportunity to participate in the original Society for American Archaeology symposium and to contribute to this book. Thoughtful comments provided by Arthur Joyce, Steve Kalasz, Casey Carmichael, the members of the University of Colorado's Graduate Writers Group, and two anonymous reviewers greatly improved the chapter's clarity and content. Partial funding for this research was provided by a National Science Foundation Graduate Research Fellowship.

NOTES

1. The period over which middens accumulated in the upper Arkansas River Basin has not been estimated, nor has their tempo of use. However, the dispersion of radiocarbon dates associated with the midden at 5LA5840 suggests that at least several generations may have elapsed between the first and last uses (Mitchell 2001). Based on Phil Dering's (1999) experimental data, a midden 7 m in diameter and 40 cm thick could have been used about 230 times; one 9 m in diameter could have been used about 380 times.

REFERENCES CITED

Ashmore, Wendy
2002 "Decisions and Dispositions": Socializing Spatial Archaeology. *American Anthropologist* 104 (4):1172–1183.

Ashmore, Wendy, and A. Bernard Knapp (editors)
1999 *Archaeologies of Landscape*. Blackwell, Oxford.

Barnes, Gerry, and Tom Williamson
2006 *Hedgerow History: Ecology, History and Landscape Character.* Windgather Press, Bollington, Macclesfield, Cheshire.

Barrett, John C.
1999a Chronologies of Landscape. In *The Archaeology and Anthropology of Landscape: Shaping Your Landscape*, ed. Peter J. Ucko and Robert Layton, 21–30. Routledge, New York.

1999b The Mythical Landscapes of the British Iron Age. In *Archaeologies of Landscape,* ed. Wendy Ashmore and A. Bernard Knapp, 253–265. Blackwell, Oxford.

Basso, Keith H.
1996 *Wisdom Sits in Places: Landscape and Language among the Western Apache*. University of New Mexico Press, Albuquerque.

Bender, Barbara
1993 Landscape—Meaning and Action. In *Landscape: Politics and Perspectives,* ed. Barbara Bender, 1–17. Berg, Oxford.
1999 Subverting the Western Gaze: Mapping Alternative Worlds. In *The Archaeology and Anthropology of Landscape: Shaping Your Landscape*, ed. Peter J. Ucko and Robert Layton, 31–45. Routledge, New York.
2002 Time and Landscape. *Current Anthropology* 43 (Supplement):S103–S112.

Bettinger, Robert L.
1991 *Hunter-Gatherers: Archaeological and Evolutionary Theory*. Plenum, New York.

Binford, Lewis R.
1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45 (1):4–20.
1982 The Archaeology of Place. *Journal of Anthropological Archaeology* 1:5–31.

Black, Stephen L.
1997 Scenarios of Midden Accumulation. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas*, ed. Stephen L. Black, Linda W. Ellis, Darrell G. Creel, and Glenn T. Goode, 83–87. Studies in Archaeology No. 22. Texas Archaeological Research Laboratory, University of Texas, Austin.

Black, Stephen L., Linda W. Ellis, Darrell G. Creel, and Glenn T. Goode (editors)
1997 *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas.* Studies in Archaeology No. 22. Texas Archaeological Research Laboratory, University of Texas, Austin.

Bourdieu, Pierre
1977 *Outline of a Theory of Practice.* Cambridge University Press, Cambridge.

Bradley, Richard
1993 *Altering the Earth: The Origins of Monuments in Britain and Continental Europe*. Society of Antiquaries of Scotland, Edinburgh.

Butler, William B.
1992 Bison Presence and Absence in Colorado. *Southwestern Lore* 58 (3):1–14.

Cashdan, Elizabeth
1992 Social Organization and Habitat Use. In *Evolutionary Ecology and Human Behavior*, ed. Eric Alden Smith and Bruce Winterhalder, 237–266. Aldine de Gruyter, New York.

Certeau, Michel de
1984 *The Practice of Everyday Life.* University of California Press, Berkeley.

Chenault, Mark L.
1982 The Excavation of the Montez Midden. In *Archaeological Resources of the Muddy Creek Drainage along State Highway 69 West of Gardner*, ed. Mark L. Chenault, 179–218. Highway Salvage Report No. 41. Colorado Department of Transportation, Denver.

Clark, John, and M. Blake
1994 The Power of Prestige: Competitive Generosity and the Emergence of Rank Societies in Lowland Mesoamerica. In *Factional Competition and Political Development in the New World*, ed. Elizabeth M. Brumfiel and John W. Fox, 17–32. Cambridge University Press, Cambridge.

Collins, Michael B.
1994 Thoughts on Future Investigation of Burned Rock Middens. In *The Burned Rock Middens of Texas: An Archaeological Symposium*, ed. Thomas R. Hester, 1–24. Studies in Archaeology No. 13. Texas Archaeological Research Laboratory, University of Texas, Austin.

Connerton, Paul
1989 *How Societies Remember.* Cambridge University Press, Cambridge.

Cosgrove, Denis E.
1988 The Geometry of Landscape: Practical and Speculative Arts in Sixteenth-Century Venetian Land Territories. In *The Iconography of Landscape*, ed. Denis E. Cosgrove and Stephen Daniels, 254–276. Cambridge University Press, Cambridge.
1998 *Social Formation and Symbolic Landscape.* University of Wisconsin Press, Madison.

Crumley, Carole L.
1994 Historical Ecology: A Multidimensional Ecological Orientation. In *Historical Ecology: Cultural Knowledge and Changing Landscapes*, ed. Carole L. Crumley, 1–16. School of American Research Press, Santa Fe, N.M.

Delcourt, Paul A., and Hazel R. Delcourt
2004 *Prehistoric Native Americans and Ecological Change.* Cambridge University Press, Cambridge.

Denevan, William
1992 The Pristine Myth: The Landscape of the Americas in 1492. *Annals of the Association of American Geographers* 82 (3):369–385.

Dering, Phil
1999 Earth-Oven Plant Processing in Archaic Period Economies: An Example from a Semi-Arid Savannah in South-Central North America. *American Antiquity* 64 (4):659–674.

Dewar, Robert E., and Kevin A. McBride
1992 Remnant Settlement Patterns. In *Space, Time, and Archaeological Landscapes*, ed. Jacqueline Rossignol and LuAnn Wandsnider, 227–255. Plenum, New York.

Dietler, Michael
1996 Feasts and Commensal Politics in the Political Economy: Food, Power and Status in Prehistoric Europe. In *Food and the Status Quest*, ed. Polly Wiessner and Wulf Schiefenhovel, 87–125. Berghahn Books, Oxford.
2001 Theorizing the Feast: Rituals of Consumption, Commensal Politics, and Power in African Contexts. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, ed. Michael Dietler and Brian Hayden, 65–114. Smithsonian Institution Press, Washington, D.C.

Duke, Philip
1991 *Points in Time*. University Press of Colorado, Niwot.

Ellis, Linda
1997 Hot Rock Technology. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas,* ed. Stephen L. Black, Linda W. Ellis, Darrell G. Creel, and Glenn T. Goode, 43–81. Studies in Archaeology No. 22. Texas Archaeological Research Laboratory, University of Texas, Austin.

Fisher, Christopher T., and Gary M. Feinman
2005 Introduction to "Landscapes over Time." *American Anthropologist* 107 (1): 62–69.

Giddens, Anthony
1979 *Central Problems in Social Theory*. University of California Press, Berkeley.
1984 *The Constitution of Society: Outline of the Theory of Structuration.* University of California Press, Berkeley.

Godelier, Maurice
1979 Territory and Property in Primitive Society. In *Human Ethology: Claims and Limits of a New Discipline*, ed. Mario von Cranach, K. Foppa, W. Lepenies, and D. Ploog, 133–155. Cambridge University Press, Cambridge.

Gosden, Chris
1994 *Social Being and Time.* Blackwell, Oxford.

Gosden, Chris, and Leslie Head
1994 Landscape—A Usefully Ambiguous Concept. *Archaeology in Oceania* 29 (3):113–116.

Greer, John W.
1966 The Louden Site (CO-1), Las Animas County, Colorado. *Southwestern Lore* 32 (3):57–66.

Gunnerson, James H.
1989 *Apishapa Canyon Archaeology: Excavations at the Cramer, Snake Blakeslee and Nearby Sites.* Reprints in Anthropology No. 41. J & L Reprint Company, Lincoln, Neb.

Hall, Stephen A.
1982 Late Holocene Paleoecology of the Southern Plains. *Quaternary Research* 17:391–407.

Hand, O. D., and Daniel A. Jepson
1996 *Archaeological Investigations at Wolf Spider Shelter (5LA6197), Las Animas County, Colorado*. Research Series No. 5. Colorado Department of Transportation, Denver.

Hayden, Brian
1996 Feasting in Prehistoric and Traditional Societies. In *Food and the Status Quest*, ed. Polly Wiessner and Wulf Schiefenhovel, 127–147. Berghahn Books, Oxford.
2001 Fabulous Feasts: A Prolegomenon to the Importance of Feasting. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, ed. Michael Dietler and Brian Hayden, 23–64. Smithsonian Institution Press, Washington, D.C.

Head, Leslie
1993 Unearthing Prehistoric Cultural Landscapes: A View from Australia. *Transactions of the British Institute of Geographers* 18:481–499.

Hirsch, Eric
1995 Landscape: Between Place and Space. In *The Anthropology of Landscape*, ed. Eric Hirsch and Michael O'Hanlon, 1–30. Clarendon, Oxford.

Hirsch, Eric, and Michael O'Hanlon (editors)
1995 *The Anthropology of Landscape*. Clarendon, Oxford.

Ingold, Tim
1993 The Temporality of the Landscape. *World Archaeology* 25:152–174.
2000 *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. Routledge, London.

Johnston, Robert
1998a Approaches to the Perception of Landscape. *Archaeological Dialogues* 5 (1):54–68.
1998b The Paradox of Landscape. *European Journal of Archaeology* 1 (3):313–325.

Joyce, Arthur A.
In press Expanding the Feast: Food Preparation, Feasting, and the Social Negotiation of Gender and Power. In *From Subsistence to Social Strategies: New Directions in the Study of Daily Meals and Feasting Events*, ed. Elizabeth A. Klarich. University Press of Colorado, Boulder.

Kalasz, Stephen M.
1990 Prehistoric Feature Analysis. In *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado*, Vol. II, ed. William Andrefsky Jr., XII-1–XII-90. Prepared by Larson-Tibesar Associates, Inc., Laramie, Wyo., and Centennial Archaeology, Inc., Fort Collins, Colo. Submitted to USDI National Park Service, Rocky Mountain Region, Denver.

Kalasz, Stephen M., Cody M. Anderson, Bonnie K. Gibson, John D. Kennedy, Christopher C. Kinneer, Lawrence L. Loendorf, and Cortney A. Wands
2007 *Archaeological Investigations at Sites 5LA3186, 5LA3188, and 5LA3189 along Burke Arroyo in the Pinon Canyon Maneuver Site, Las Animas County, Colorado.* Prepared by Centennial Archaeology, Inc., Fort Collins, Colo. Submitted to New Mexico State University, Las Cruces, and United States Army, Directorate of Environmental Compliance and Management (DECAM), Fort Carson Military Reservation, Colo.

Kalasz, Stephen M., Mark Mitchell, and Christian J. Zier
1999 Late Prehistoric Stage. In *Colorado Prehistory: A Context for the Arkansas River Basin*, ed. Christian J. Zier and Stephen M. Kalasz, 141–263. Colorado Council of Professional Archaeologists, Denver.

Kelly, Robert L.
1995 *The Foraging Spectrum*. Smithsonian Institution Press, Washington, D.C.

Knapp, A. Bernard, and Wendy Ashmore
1999 Archaeological Landscapes: Constructed, Conceptualized, Ideational. In *Archaeologies of Landscape,* ed. Wendy Ashmore and A. Bernard Knapp, 1–30. Blackwell, Oxford.

Kvamme, Kenneth L.
2003 Geophysical Surveys as Landscape Archaeology. *American Antiquity* 68 (3): 435–457.

Lemaire, Ton
1997 Archaeology between the Invention and Destruction of the Landscape. *Archaeological Dialogues* 4:5–21.

Lindauer, Owen
2000 A Schoolhouse Point Perspective on Salado Community Development. In *Salado*, ed. Jeffrey S. Dean, 219–240. University of New Mexico Press, Albuquerque.

Mauss, Marcel
1973 [1935] Techniques of the Body. *Economy and Society* 2 (1):70–88.

McGlade, James
1995 Archaeology and the Eco-dynamics of Human-Modified Landscapes. *Antiquity* 69:113–132.

Mitchell, Mark D.
2001 Hot Rock Cooking in the Picketwire Canyonlands, Southeastern Colorado. Paper presented at the 59th Annual Plains Anthropological Conference, Lincoln, Neb.

Mueller, Marilynn, Christian J. Zier, and Stephen A. Brown
1994 *Cultural Resource Inventory and Excavations for the Diamond Shamrock Colorado Springs Pipeline, Southeastern Colorado.* Prepared by Centennial Archaeology, Inc., Fort Collins, Colo. Submitted to USDA Forest Service, Pike and San Isabel National Forests, Pueblo, Colo.

Nowak, Michael, and Christopher A. Jones
1984 *Archaeological Investigations in Southeastern Colorado.* Publications in Archaeology No. 7. Department of Anthropology, Colorado College, Colorado Springs.
1985 *Archaeological Investigations in Southeastern Colorado.* Publications in Archaeology No. 8. Department of Anthropology, Colorado College, Colorado Springs.
1986 *Archaeological Investigations in Southeastern Colorado.* Publications in Archaeology No. 9. Department of Anthropology, Colorado College, Colorado Springs.

O'Connell, James F., Peter K. Latz, and Peggy Barnett
1983 Traditional and Modern Plant Use among the Alyawara of Central Australia. *Economic Botany* 37 (1):80–109.

Painter, Mary W., Amy Holmes, Michael McFaul, and Christian J. Zier
1999 Environmental Setting. In *Colorado Prehistory: A Context for the Arkansas River Basin*, ed. Christian J. Zier and Stephen M. Kalasz, 5–24. Colorado Council of Professional Archaeologists, Denver.

Pauketat, Tim R.
2001 Practice and History in Archaeology. *Anthropological Theory* 1 (1):73–98.

Phillips, David A., and Lynne Sebastian
2004 Large-Scale Feasting and Politics: An Essay on Power in Precontact Southwestern Societies. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, ed. Barbara J. Mills, 233–258. University Press of Colorado, Boulder.

Potter, James M.
2000 Pots, Parties, and Politics: Communal Feasting in the American Southwest. *American Antiquity* 65 (3):471–492.

Potter, James M., and Scott G. Ortman
2004 Community Cuisine in the Prehispanic American Southwest. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, ed. Barbara J. Mills, 173–191. University Press of Colorado, Boulder.

Pred, Allan
1984 Place as Historically Continent Process: Structuration and the Time-Geography of Becoming Places. *Annals of the Association of American Geographers* 74 (2):279–297.

Puseman, Kathryn, and Linda Scott Cummings
2001 *Pollen, Starch, Macrofloral, and Protein Residue Analysis at 5LA5840, Southeast Colorado*. Paleo Research Institute Technical Report 01-56. Submitted to USDA Forest Service, Comanche National Grassland, La Junta, Colo.

Robin, Cynthia
2002 Outside of Houses: The Practices of Everyday Life at Chan Nòohol, Belize. *Journal of Social Archaeology* 2 (2):245–268.

Shennan, Stephen
1993 After Social Evolution: A New Archaeological Agenda? In *Archaeological Theory: Who Sets the Agenda?* ed. Norman Yoffee and Andrew Sherratt, 53–59. Cambridge University Press, Cambridge.

Shields, W. Lane
1980 Preliminary Investigations at the McEndree Ranch Site, 5BA30. *Southwestern Lore* (46) 3:1–17.

Siemer, Eugene G.
1977 *Colorado Climate.* Colorado Experiment Station, Colorado State University, Fort Collins.

Smith, Craig S., and Lance M. McNees
1999 Facilities and Hunter-Gatherer Long-Term Land Use Patterns: An Example from Southwestern Wyoming. *American Antiquity* 64 (1):117–136.

Spielmann, Katherine A.
2002 Feasting, Craft Specialization, and the Ritual Mode of Production in Small-Scale Societies. *American Anthropologist* 104 (1):195–207.

Steward, Julian H.
1938 *Basin-Plateau Aboriginal Sociopolitical Groups*. Bulletin No. 120. Bureau of American Ethnology, Washington, D.C.

Tacon, Paul S.C.
1994 Socializing Landscapes: The Long-Term Implications of Signs, Symbols and Marks on the Land. *Archaeology in Oceania* 29:117–129.

Thomas, Julian
1996 *Time, Culture and Identity: An Interpretive Archaeology*. Routledge, New York.

Tilley, Christopher
1994 *A Phenomenology of Landscape.* Berg, Oxford.

Ucko, Peter J., and Robert Layton
1999 Introduction: Gazing on the Landscape and Encountering the Environment. In *The Archaeology and Anthropology of Landscape: Shaping Your Landscape*, ed. Peter J. Ucko and Robert Layton, 1–20. Routledge, New York.

van der Leeuw, Sander E., and Charles L. Redman
2002 Placing Archaeology at the Center of Socio-Natural Studies. *American Antiquity* 67 (4):597–605.

Van Dyke, Ruth M., and Susan E. Alcock
2003 Archaeologies of Memory: An Introduction. In *Archaeologies of Memory*, ed. Ruth M. Van Dyke and Susan E. Alcock, 1–13. Blackwell, Oxford.

Wandsnider, LuAnn
1992 The Spatial Dimension of Time. In *Space, Time, and Archaeological Landscapes*, ed. Jacqueline Rossignol and LuAnn Wandsnider, 257–282. Plenum, New York.
1997 The Roasted and the Boiled: Food Consumption and Heat Treatment with Special Emphasis on Pit-Hearth Cooking. *Journal of Anthropological Archaeology* 16:1–48.
1998 Landscape Element Configuration, Lifespace, and Occupational History: Ethnoarchaeological Observations and Archaeological Applications. In *Surface Archaeology*, ed. Alan P. Sullivan III, 21–39. University of New Mexico Press, Albuquerque.

Wedel, Waldo R.
1953 Some Aspects of Human Ecology in the Central Plains. *American Anthropologist* 55 (4):499–514.

Wills, W. H., and Patricia L. Crown
2004 Commensal Politics in the Prehispanic Southwest: An Introductory Review. In *Identity, Feasting, and the Archaeology of the Greater Southwest*, ed. Barbara J. Mills, 153–172. University Press of Colorado, Boulder.

Winterhalder, Bruce
2001 The Behavioral Ecology of Hunter-Gatherers. In *Hunter-Gatherers: An Interdisciplinary Perspective,* ed. Catherine Panter-Brick, Robert H. Layton, and Peter Rowley-Conwy, 12–38. Cambridge University Press, Cambridge.

Winterhalder, Bruce, and Eric Alden Smith (editors)
1981 *Hunter-Gatherer Foraging Strategies.* University of Chicago Press, Chicago.

Zier, Christian J.
1999 Archaic Stage. In *Colorado Prehistory: A Context for the Arkansas River Basin*, ed. Christian J. Zier and Stephen M. Kalasz, 100–140. Colorado Council of Professional Archaeologists, Denver.

Zier, Christian J., and Stephen M. Kalasz
1991 Recon John Shelter and the Archaic-Woodland Transition in Southeastern Colorado. *Plains Anthropologist* 36 (135):111–138.

Published by the University Press of Colorado
5589 Arapahoe Avenue, Suite 206C
Boulder, Colorado 80303

Printed in the United States of America

The University Press of Colorado is a proud member of the Association of American University Presses.

The University Press of Colorado is a cooperative publishing enterprise supported, in part, by Adams State College, Colorado State University, Fort Lewis College, Mesa State College, Metropolitan State College of Denver, University of Colorado, University of Northern Colorado, and Western State College of Colorado.

The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials. ANSI Z39.48-1992

Library of Congress Cataloging-in-Publication Data

Archaeological landscapes on the High Plains / edited by Laura L. Scheiber and Bonnie J. Clark.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-87081-931-5 (alk. paper)
1. High Plains (U.S.)—History, Local. 2. High Plains (U.S.)—Antiquities. 3. Excavations (Archaeology)—High Plains (U.S.) 4. Historic sites—High Plains (U.S.) 5. Landscape archaeology—High Plains (U.S.) 6. Archaeology and history—High Plains (U.S.) 7. Social archaeology—High Plains (U.S.) 8. Indians of North America—High Plains (U.S.)—Antiquities. 9. Human ecology—High Plains (U.S.)—History. I. Scheiber, Laura L. II. Clark, Bonnie J.
F590.7.A73 2008
978'.01072—dc22

2008029530

Design by Daniel Pratt

17 16 15 14 13 12 11 10 09 08 10 9 8 7 6 5 4 3 2 1