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CHAPTER 4

WHAT IT TAKES TO GET COMPLEX

FOOD, GOODS, AND WORK AS SHARED CULTURAL IDEALS FROM THE BEGINNING OF SEDENTISM

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The majority of chapters in this volume consider ancient and modern societies at their most developed stages, with a particular focus on chiefdoms and states. In this chapter, I look back into prehistory to examine the individual cognitive and social capacities manifested in human societies before the development of institutionalized political hierarchies. As Kyle Summers (2005:108) has observed, the last ten thousand years of human evolution has not changed gene frequencies sufficiently to account for new behavioral patterns; instead, preexisting propensities have led to the capacity of individuals to develop and adjust to new technological and social environments. Prior to ten to twelve thousand years ago, human group size was relatively small and organized along lines of kinship and affinity in which the majority of interactions were undertaken with already-known persons. In this chapter, I argue that those characteristics provided the necessary social foundation for the subsequent development of chiefdoms, states, and empires (see also Peterson and Drennan, Chapter 6).

Our species' ability to deliberately alter the environment, create complex tools, and make choices about food consumption and goods acquisition is evident by the Upper Paleolithic period starting fifty thousand years ago. Sophisticated investments in cognition and communication were exhibited in the creation of non-utilitarian "art" such as paintings and carvings, the development of portable symbol systems in the form of durable ornamentation, and the elaboration of burial customs. These actions, undertaken by individuals in a shared rubric of cultural understanding about intent and meaning, were elaborated through continued investments in objects and fixed-place settlements. After the adoption of sedentism, the transition to social complexity was manifested in the elaboration of ritual, the emergence of permanent leadership, and the specialization of economic inputs. Decisions exercised by individuals about actions at the household level

continued even after the development of institutionalized political hierarchies, a factor that underwrote the capacity of elites to achieve large-scale outcomes through the appropriation of *some* food, the control of *some* goods, and the cooption of *some* labor.

Food, Goods, and Work: The Material Signatures of Individual Decision Making

The materialization of human cognitive capacities is carried out daily in three basic realms: food, objects, and work. Each of these activities leaves archaeological traces that can be utilized to evaluate both change over time and the stasis of systems (or "traditions") that remain unchanging. Both stasis and change are the result of conscious acts by individuals who expend energy; while much human action is habituated, the parameters of that habituation can be challenged when natural or social inputs change, resulting in a stable-yet-fluid dynamic of production and consumption that is consciously maintained and furthered by each individual action.

Food is a basic human need that must be addressed by every living person, but food is utilized by people in many and diverse ways. Not everything that is edible is eaten, and not everyone is sanctioned to eat from the same menu. Within socially acceptable parameters, it is the individual who chooses to eat or not eat from the array of available foods. Through the expression of both food preferences and food taboos, people affirm their individual and group identity on a daily basis. Preference can be seen as a very deeply held component of the human food quest, evident as early as the beginning of the Upper Paleolithic when humans became the only predators to consistently target prime animals (Stiner 1994:chapter 11). In a study of the subsequent Mesolithic, Preston Miracle (2002) urges that we consider the development of food preferences and "cuisine" for hunter-gatherers as an important component of the social development of eating. Factors such as food availability, preference, and choice appear to have affected domestication as well (Fuller 2002), and it is clear that even after the advent of agriculture people continued to utilize a variety of "wild" resources as integral components of the diet (Mabry 2005; Smith 2006). Agriculture and sedentism encompassed many more types of decisions about food, including calculations of energy investment in intensification and food processing as well as the use of memory and social planning to create and manage storage systems for seasonally harvested foods.

Objects are another essential component of daily life, through which humans modify their environment and communicate with others. The use

of objects as a human trait began as early as two and a half million years ago with the Oldowan chopper complex, and became increasingly diverse and sophisticated by about forty thousand years ago when ornaments as a symbolic manifestation supplemented the diversity of objects that could be used for practical tasks (Bar–Yosef 2002; Kuhn et al. 2001). People afterwards used objects to project social roles as well as to affirm both private and public identity (Smith 2007, 2010). The ubiquity of objects in the archaeological record enables us to discuss modes of acquisition (gift, exchange, theft), as well as the use of objects for practical purposes and for their display value. Even discard is important: humans cease their interactions with objects in a variety of ways, ranging from ostentatious removal through burial with the dead, to daily removal of trash in middens that are often located in front of houses in a way that signals social status and prosperity.

Work is a process through which individuals modify their social and physical environments. Although the anthropological evaluation of work tends to focus on "labor" and its attendant exploitative connotations, a broader definition of work as energy expenditure enables us to see how individuals direct themselves physically to address short-term, medium-term, and long-term outcomes. Even the simplest decisions about work involve the individual capacity to engage in calculations about time, space, and value: for example, grain can be prepared through labor-intensive grinding and baking, fuel-intensive boiling, or time-intensive fermentation. "Work" occurs not only in the form of physical energy expenditure, but also includes intangible activities such as storytelling, memory-work, adjudication, and other forms of communication. Given the need to respond to dynamic natural and social surroundings, individuals engage in selective energy expenditure in which each decision has an impact on subsequent activities. The outcomes of work are conditioned by factors of skill, for example when individuals apprentice themselves in specialized occupations such as ritual and medicine. Outcomes also are conditioned by factors of temporality as individuals age and either acquire virtuosity in quotidian tasks through practice or lose physical strength and reduce their task set.

In their decisions about food, goods, and work, individuals thoughtfully consider the results of their actions and purposefully engage with the material world. Individual decision-making as an active component of quotidian practices was the social basis upon which increasingly sophisticated social and economic systems were crafted at least fifty thousand years ago. The increasingly intensive manipulation of the environment in many parts of the world ten to twelve thousand years ago, often resulting in the adoption

of domesticated plants and animals, further required the elaboration of individual decision-making capacities and "multi-tasking" to address new obligation and opportunities. Domesticated plants, for example, require a significant recalibration in expectations about the relationship of energy expenditure to results. The incremental efforts of tending plants until the moment of harvest represent a daily increment of "sunk costs" in planting, weeding, watering, and pest control. Energy that is expended in plant management cannot simultaneously be devoted to gathering wild foods, and the payoff of domesticates for the farmer is a long-term one that requires future planning from the moment of planting through the harvest and beyond. The harvest itself engenders further decision-making and energy inputs: storage facilities must be designed and built to keep out rodents, damp, and unauthorized human access. Each time a storage facility is opened, the user must calculate how much to remove and how much to keep behind for future use, and how far in the future that use will be.

All of these decisions about food, goods, and work are exercised at the quotidian level and through individual thought processes. Evident in sophisticated form as early as ten to twelve thousand years ago, they continued to increase as populations grew and as social complexity became materially defined through new demands placed on households by leaders who collected resources and pooled them for political, ritual, and communal activities. From the individual perspective, the emergence of hierarchical leadership meant that decisions about daily and annual energy expenditure were interwoven with new requirements such as taxation and corvée labor requirements. To examine the way in which quotidian decisions were exercised at the individual level as a integral component of increased social complexity, we can examine three areas of the world in which there are robust data sets covering long time spans: the Indus Valley, with a particular emphasis on the example of the Neolithic community at Mehrgarh (Pakistan); the Levant from the beginnings of the Natufian culture; and the American Southwest starting with the Archaic and ending with the Pueblo period.

Trajectories in the Levant

The hinterlands of the Eastern Mediterranean have been described as one of the "cradles of civilization" and one of the first places in the world where people experimented with the domestication of plants and animals (Kuijt and Goring-Morris 2002; Richerson et al. 2001; Salamini et al. 2002; Watkins 2005). In this region, shared cultural beliefs were developed at the

same time as a shared basis of foodways and other daily domestic components of life, resulting in a highly ritualized set of beliefs about food, goods, and energy expenditure.

The social context of food preference is seen first in the Upper Paleolithic by a diversification of hunted food sources to include more small game (the "broad spectrum revolution"; Flannery 1969; Stiner 2001). By the Epipaleolithic (starting around twenty thousand years ago), environmental and archaeological studies show that humans utilized a wide range of plant and animal resources, including seasonal high-calorie, storable resources such as nuts, fruits, and seeds (Watkins 2005). A long history of research in the Levant enables us to examine the subsequent, intertwined ecological and social changes that afterwards developed in the Natufian (14,000–11,600 B.C.), Pre-Pottery Neolithic A (11,700–10,500 B.C.) and Pre-Pottery Neolithic B (10,500–8400 B.C.; see Kuijt and Goring-Morris 2002, Watkins 2005 for dates).

The development of the early Levantine agricultural economy is encapsulated by Randi Haaland (2007), who examines the development of Near Eastern foodways based on starchy staples such as wheat and barley. Noting that the earliest use of wild grasses dates to as early as 19,000 B.C. at Ohalo II, Haaland discusses the long trajectory of a pre-pottery period of grass seed use in the form of grinding tools. In her view, a focus on human decision making as an incremental, quotidian process shifts the understanding of early agriculture to emphasize the methods, rather than merely the product, of this transition. She notes that the "first important step in the emergence of agriculture was thus cultivation, not domestication. Cultivation is a socioeconomic process that constitutes the selection pressures affecting the biological process leading to the evolution from wild to domesticated . . ." (2007:172).

Although much of the adjustment in behavior tends to be interpreted by archaeologists from the perspective of the *longue durée*, Haaland's work reminds us that each of the actions undertaken to manage the environment and mitigate environmental fluctuation was undertaken by individuals engaged in daily activities of resource procurement and food preparation. Adaptations varied considerably from place to place within the Levant, meaning that individuals could watch the result of decisions made by others and elect to repeat or ignore the innovations of their neighbors. Pioneering settlements such as Ohalo II were inhabited in full view of other communities who did not immediately take up this mode of life; as Watkins (2005:207) summarizes, "Ohalo II is not typical of its period, for other Kebaran sites show evidence of repeated, short occupations by mobile hunter-gatherer bands. But Ohalo II does demonstrate that some groups were already tending toward sedentism and the year-round exploitation of an ecologically diverse home territory."

Environmental variability in both spatial and temporal terms provided the parameters for individual decision making on a daily, seasonal, annual, and lifetime basis. As Kuijt and Goring-Morris (2002:365) note, "Gradual changes in the environment could sometimes be accommodated whereas abrupt changes would have necessitated radical readjustments." Climate fluctuated considerably in the Levant throughout the past twenty thousand years, resulting in a variety of adjustments ranging from migration into better-favored areas during dry periods (e.g., at the end of the Natufian; see Kuijt and Goring-Morris 2002:371) to changes in household-level risk management that included communal storage and food sharing (see Flannery 2002).

The incremental development of sedentism, agriculture, and herding in the Levant can be discerned in the archaeological record through artifacts and features including hearths, storage facilities, grinding tools, and farming equipment. People altered many aspects of the built environment to accommodate new ways of procuring food, new types of foods, new ways of seeing the landscape, and even the growth of population that accompanied the advent of foods such as porridge that could be used to sustain both the very young and the very old (e.g., Molleson 1995). Even basic configurations of houses changed, with the transition from round houses to square ones observed by Flannery (1972) as a means of creating architecture that could be more easily added onto as households grew in size. Although leadership was probably evident in some elements of communal activity such as large-scale ritual events, the household's many daily decisions about cooking, eating, building, storage, resource allocation, domestic ritual, cleaning, and clothing were still undertaken one person at a time.

In an expansion of his 1972 article, Flannery (2002) provides an example of how small-scale changes within sites were generated at the household level and manifested in material remains. Using the example of Tell Hasuna in Iraq, he observes how changes in domestic architectural styles to accommodate larger-than-nuclear families were first made through the haphazard adjoining of rooms. In later phases, houses were purposefully laid out as larger, compartmentalized spaces that indicate their builders' intent to house a larger number of people as an acknowledgment of shifts in family size ideals. Although the site of Hasuna is relatively late (sixth millennium B.C.), the careful elucidation of phase-by-phase changes in the excavations cited by Flannery provides a model for looking at changes elsewhere that

were undertaken one building and one generation at a time, in which decisions were materialized based on individual memory, planning, and predictive capacity. Flannery's more recent perspective on the variable adaptations seen in the early agricultural period leads him to conclude that the relatively rigid equivalencies of subsistence modes, storage and risk acceptance, and architectural configurations that he proposed in his 1972 paper were overdrawn. Instead, he concludes, "It appears that, far back in time, human agents made strategic decisions among alternatives for reasons which are not always apparent archaeologically" (2002:422).

Near Eastern burial treatments also show incremental decision making in the development and sustaining of ritual traditions. Increasingly elaborate, purposeful burials of individuals are seen at Epipaleolithic sites such as Neve David, where a young male was buried in a slab-lined grave pit accompanied by a grinding slab and a stone bowl (Kaufman 1989:277), indicative of the increasing symbolic importance of new subsistence practices. In the following Natufian period, "Most burials are primary and of a single individual, although secondary and multiple burials are also observed. Burial offerings are sometimes found on or around the interred" (Eshed et al. 2004:316). By the subsequent Neolithic period, burials became much more elaborate, including secondary mortuary treatments and ritual behaviors that combined architectural and burial activities in highly symbolic terms. The diversity of burial treatments in the Neolithic period, which included secondary burial, the re-use of skulls, the creation of figurines and half-size human effigies, painted heads on animal bones, and the occasional presence of stone masks, is evidence of "a remarkable regional similarity in mortuary practices and, at the same time, a high degree of variation in those practices between settlements" (Kuijt 2008:172). Decisions to participate in the regional tradition, as well as the forms of practice within a site or at a given time, were undertaken by individuals who assessed expectations and capacities at the moment of the specific ritual act.

Even ancillary behavioral patterns, such as trash disposal, were subject to modifications. In the Neolithic, changes in trash deposition indicate individuals' creation and acceptance of changing social parameters of behavior: "In contrast to the preceding Natufian, a major innovation begun during the PPNA and becoming widespread during the PPNB in the Mediterranean zone was systematic house cleaning and the dumping of refuse in clearly defined adjacent refuse areas" (Kuijt and Goring-Morris 2002:373). Along with the elaboration of ritual practices, routine activities ranging from house-building to foodways show that for Neolithic people, there was

more work, and more types of work, in which individuals and households could be engaged.

In the ancient Near East, decisions related to food, objects, and energy expenditure undertaken at the village level continued to be made by individuals who became incorporated into successively larger physical entities such as the city and progressively larger social institutions such as the state starting in the Uruk period (4200–3000 B.C.). Sustained regional interactions throughout periods of dramatic episodes of state formation, including those identified through the study of trade connections, indicate the extent to which ordinary domestic activities resulted in the cultural cohesion that underwrote and sustained several subsequent millennia of complex political hierarchies.

Trajectories in the Indus Valley

The Indus Valley region is located in the alluvial plains of present-day Pakistan and western India. Best known archaeologically for the Bronze-Age Harappan culture (2500–1800 B.C.), the Indus region also has significant remains relating to earlier periods. With a long trajectory of human population development, the Indus region is an excellent place to look at the processes of initial agriculture and sedentism. The relatively close geographic proximity between the alluvial plains of the Indus and the "fertile crescent" of the Near East has prompted attempts to link technologies and social groupings from one area to the other. Examined from the South Asian perspective, however, there were many opportunities for the independent domestication of some plants and animals (MacHugh et al. 1997; Morrell and Clegg 2007; Possehl 2002).

One limitation to the comparative study of this region is that few sites of the earliest phases have been investigated; however, extensive investigations at the site of Mehrgarh (Jarrige 2004, Jarrige et al. 1995) serve as a proxy for regional patterns of cultural development. Mehrgarh, occupied from 7000–1600 B.C., is located in the western part of Pakistan at an ecotone where alluvial plains and upland meet. In this environment, people could readily exploit multiple natural resources in a manner that would reduce risk as well as provide opportunities for diversified production intensification in both plants and animals. Extensive excavations at the site show the development of agricultural strategies, architectural investments, and ritual activities in long-term patterns of stasis and change indicative of individual and household-level decision making.

From the beginning of the occupation, Mehrgarh's architecture consisted of structures described as freestanding, multiroomed, rectangular houses (Jarrige 2004:27). However, it was not until the sixth millennium that clay containers are recovered in association with this architecture, indicating that Mehrgarh (like the Levant) sustained a pre-pottery Neolithic tradition. By the fifth millennium, people were simultaneously investing more labor in storage, food processing, and architecture. Jean-François Jarrige (2004:29) notes that structures were more elaborate, and that "a more careful threshing of the cereals... is clearly indicated by an almost complete disappearance of the impressions of seeds or whole ears that are so frequent in the Neolithic walls." Another change in foodways is seen at the midpoint of the occupational sequence when pig bones increased in frequency and then decreased again, leading the project's faunal analyst Richard Meadow to propose that there might have been an attempt at pig domestication in the fourth millennium that was later abandoned (reported in Jarrige 1995:77).

Figurines are another way in which social and ritual traditions can be examined. Figurines appear throughout the Indus Valley starting in the seventh millennium B.C.; at Mehrgarh, they are found in a wide variety of contexts and show an evolution from a generalized anthropomorph through a stage of bovine forms to a corpus of predominantly female figures, often with elaborate coiffures (Jarrige 1991). The hairstyles, along with the rolled clay layers that appear to represent jewelry, change from one era to the next and include various types of ringlets, coils, and even wigs. In nearly all cultures, hairstyles are one of the most basic ways in which people project their identity in the public sphere, along with clothing, headgear, and ornaments. The Mehrgarh figurines constitute one of the ancient world's few archaeologically documented examples of the dynamic ephemera of hair.

Figurines – and the living sartorial traditions they mirrored – were part of a regional culture in which there was a fluid distribution of styles across space and over time providing evidence for the often archaeologically invisible quotidian decisions made on an individual basis long before the advent of the state. Frequent changes in the shape, style, and decoration of the Mehrgarh figurines show a dynamic engagement with the production and consumption process by people who would have been experiencing many other cultural and environmental shifts including increased dependence on agricultural products and the engagement with highland peoples in cycles of transhumance that eventually linked the Indus region to the Iranian plateau and to Central Asia. Not all practices involved innovation, however, indicating that choices also included the deliberate selection of traditions and

stasis. At Mehrgarh, burial practices are represented by what the excavator characterizes as "great homogeneity of grave goods, which are limited to necklaces and bracelets of baked white steatite micro-beads and a few pendants of lapis lazuli and other semiprecious stones" (Jarrige 1995:73).

Throughout the millennia of Mehrgarh's development, individuals and households were expending more energy in a variety of ways simultaneously, resulting in pressure for time management and planning throughout the economic spectrum. By about 3500 B.C., there is evidence of supra-household labor investment in the form of a ditch discovered at the edge of the settlement that the investigators interpreted as an irrigation canal (Jarrige et al. 1995:451). Energy expenditures for these supra-household allocations would have been added to the activities that people already scheduled for themselves. As in the case of the Levant, elaborate social, economic, and ritual traditions were sustained at the individual level and became the basis upon which increasingly complex sociopolitical configurations were established.

Although Mehrgarh itself did not become a city, by the middle of the third millennium B.C. the Indus region featured genuine urban configurations at sites such as Dholavira, Harappa, and Mohenjo-daro. People living in those urban centers continued to use the same agricultural base as the preceding Neolithic, as well as the same techniques of craft production and the types and styles of ornaments, architecture, and culinary practices seen at Mehrgarh and other nearby sites where the latest Neolithic figurines "already incorporate in embryonic form all the elements of the Indus civilization figurines with their elaborate hairstyles, loin-cloths and applied ornaments" (Jarrige 1991:92). These long-standing traditions, deliberately maintained, were augmented by new expressions of social hierarchy: walls around urban subdivisions, an elaborate script system, and the development of standardized ornaments made from a variety of raw materials. Writing about the Indus patterns of accommodating new hierarchies upon sustained cultural patterns, Mark Kenoyer notes that the "reproduction of identical shapes and styles using different raw materials helps to unify people within a single culture and belief system, even though not everyone enjoys the same wealth or status" (Kenoyer 1998:143).

Trajectories in the American Southwest

The American Southwest provides an extensive data set for assessing the development of social complexity, principally focused on the Four Corners area of Colorado, Arizona, Utah, and New Mexico. As in the Levant

and the Indus, the time frame for the transition from foraging to farming is a long one, with about two millennia of experimentation with local plants before the adoption of fully-domesticated maize from Mexico circa 2100 B.C. (Mabry 2005:63). The culmination of the developmental trajectory from initial plant experimentation to sedentary farming to chiefdom (or chiefdom-like) levels of complexity are easily readable in the form of massive pueblo architecture concentrated in sequentially occupied locations (e.g., Chaco Canyon, 900–1150 A.D.; Mesa Verde, 1150–1300 A.D., and the northern Rio Grande region of New Mexico 1300–1450 A.D.).

Yet each act of foraging, farming, and construction was carried out one person at a time, building on centuries-old patterns of adaptation to the landscape through a process of cognitive assessment of each day, each season, and each lifetime. As in the case of the Indus and the Levant, *longue-durée* perceptions of agricultural increase are a scholarly abstraction of a process that resulted from many thousands of households' decisions about the parameters of successful resource extraction. Jonathan Mabry (2005:47) notes that during the period 4500–2500 B.C. when climate studies show a late-Holocene moist interval, "agriculture was introduced to the region and became the focus of subsistence, runoff farming and flood farming were possible on regularly flooding alluvial fans and floodplains, dry farming was possible on active sand dunes that dammed springs and conserved soil moisture, and irrigated farming was possible near permanent springs and along perennial reaches of rivers." The creative use of microclimate zones by early farmers was an extension of foragers' knowledge about resource variation in the landscape. This perspective brings to fruition Winterhalder and Goland's (1997:123–24) exhortation that we should look at localized decision making that made use of topographic variations and "field dispersion . . . to reduce risk in the same manner as does sharing among hunter-gatherers."

The landscapes of the American Southwest, with their distinctive topography and limited pockets of fertile ground, are likely to have instilled in each person not only the knowledge of resource availability but also a sense of memory as well as social and emotional ties encapsulated in landscape terms (for much later periods, see Basso 1996). People added stylistic markers to these natural demarcations of the landscape, producing ceramic vessels with regionally specific designs that were widely traded throughout the Southwest and that probably served as the vehicles for language-based communication about social ties and communal memory over large landscapes. By the late first millennium A.D., even utilitarian pottery appears to have moved over considerable distances, prompting Toll (2001:60) to note

that these transfers were probably "based on more than pure need" (see also Abbott 2010).

Ritual expansion also occurred as a component of social networks. The most spectacular manifestation of a shared ideology can be seen at Chaco Canyon, a collection of large masonry pueblos in northwestern New Mexico. At Chaco, we can trace "ritualized" (cf. Bradley 2005:33) aspects found in basic activities such as food procurement. Extensive catchment systems were constructed that channeled water running off of canyon rims into local field systems (Cordell 1984). Although labor-intensive, these efforts were insufficient to feed the large numbers of people who lived and visited, so residents and visitors developed supplemental systems of resource provisioning. Analysis of maize found at Chaco Canyon indicates that it was grown in a variety of regions and thereafter transported 80–90 kilometers (Benson et al. 2003). Research on other domestic needs indicates that timber for construction and pottery for cooking were also brought from similar distances (e.g., Toll 2001; Windes and McKenna 2001). Although most researchers would agree that Chaco was "a highly organized, centralized, hierarchical, regional sociopolitical system" (Cordell 1984:273), evidence for coercion is slight (Windes and McKenna 2001:135). Instead, Chaco appears to have been sustained by many thousands of acts of individual decision making to allocate time and energy for the production of food and transportation of resources to a place of symbolic importance.

The simple fact of food production, distribution, and consumption provides a fine-scaled window of insight that humanizes the discussion of the American Southwest beyond the climate-driven, often mechanistic models of complexity offered for the region (e.g., Kohler et al. 2000; Reynolds et al. 2005). The adoption of cultigens seems to be part of a long trajectory of plant husbandry; although older explanations of maize adoption in the Southwest proposed that it was the result of a dramatic introduction from Mesoamerica, the accumulation of data on different rates and places of adoption show a multifaceted, lengthy, and idiosyncratic process of adoption. Moreover, this adoption appears to have enhanced a preexisting process of tending indigenous plants such as chenopodium and amaranth, such that the introduction of maize was a modification and extension of practices already in place (Mabry 2005).

The use of many different types of plants suggests that for the Southwest, the development of agriculture, irrigation, and sedentism was the result of a suite of knowledge held by individuals and incrementally implemented and modified to fit prevailing conditions. The adoption of cultigens was just one of many steps in the development of foodways, as there were subsequent

decisions made about the storage, preparation, cooking, and serving of the domesticated product. Acknowledging the variation in the adoption of new ways of preparing food, including pottery and metates, Patricia Crown (2001:245–46) has noted that "data from smaller areas of the Southwest reveals considerable variation in the timing of changes in ground-stone tool morphology and size (Hard, Mauldin, and Raymond 1996), indicating the importance of individual decisions and strategies in adopting new technology."

Discussion

As archaeologists, we investigate the material remains that represent the actions of individual people engaged in daily activities involving food, goods, and energy expenditure. Long before the development of social complexity, individuals were intimately familiar with the concepts of multitasking, time management, spatial and temporal allocations of energy, future planning, and memory-enhanced quotidian decision making. These individual perceptions are evident in deep prehistory and were acted on in a constant series of trade-offs to address short-term, medium-term, and long-term outcomes. Even prior to the emergence of fully modern *Homo sapiens*, our ancestors individually capitalized on a number of cognitive skills: the collection and carrying of stone suitable for working by 1.6 million years ago, the control of fire by about 400,000 years ago, and the use of composite tools by 250,000 years ago. The cognitive skills exhibited in these individually-managed activities in turn provided the foundations for the increasingly sophisticated management of both natural landscapes and cultural interactions by the Upper Paleolithic era fifty thousand years ago.

The engagement with increasingly complex foodways starting as early as twenty thousand years ago, including the eventual domestication of plants and animals, provided an increasingly diverse arena for our species' cognitive skills. Memory and planning were necessary components of new subsistence patterns; not only were they needed for the allocation of land and the production of food, but they were critical in the allocation of stored resources. Farmers and their households watched their stockpiles of comestibles inflate seasonally but dwindle daily, requiring a long-term investment in allocation against which there was always a pressure to trade off future needs with present wants. The archaeological record indicates that at the same time that agricultural investments were increasing, people also increased the time and attention devoted to ritual, such that the

transformation to agriculture and sedentism increased workloads at the household level in a number of ways simultaneously.

Even in the most advanced states and empires that developed after the transition to settled agricultural lifeways, most decisions about quotidian events continued to be made at the individual and household level, away from the control – or even perception – of elites. Individuals interwove the demands of political and social hierarchies into their already-existing commitments to short-term, medium-term, and long-term processes. The evidence of leadership starting in the Neolithic includes many artifactual and architectural components with high archaeological visibility: large-scale construction projects indicative of sustained management, widespread destruction at a scale beyond household violence and disruption, and/or the appearance of distinctive styles in portable objects. However, each of these materializations was added onto the diverse economic and social repertoire already sustained by individuals and households.

Leaders were likely to be most successful when they exhorted participants to undertake activities with which ordinary people were already familiar, such as ritual and agriculture. Leaders added the novel component of scale, providing a certain psychological "safety in numbers" as increasing numbers of individuals participated in community projects. Richard Sosis (2003) has explored the way in which ritual behavior is both externally projected and internally realized through acts of costly signaling that demonstrate their participants' commitment, a factor that may help to describe individuals' willingness to participate in ritualized behavior of all kinds including that which produces architecture, irrigation works, and other secular monuments.

Conclusion

Archaeological investigation works at a larger time frame than the individual life span, meaning that the understanding of ancient activities is often subsumed into interpretative frameworks that emphasize the *longue durée*. However, we do not excavate "cultural systems"; instead, what we recover from the archaeological record are the remains of individuals' actions in the form of houses, hearths, middens, workshops, storage pits, and burials. In antiquity, most goods and features were designed to be used by one person at a time. Most objects also were made by one person from start to finish, with manufacture dependent on the ability of an individual to envision the entire process of transforming raw materials into a finished product.

Even the largest archaeological monuments, directed by political or religious leaders, were the result of individual hands under conditions in which each working person undertook many other forms of energy expenditure when not working on a leader-directed task.

A prehistory of ordinary people illustrates the dynamic way in which each individual engaged an autonomous cognitive capacity to address both the natural and the social landscape. Much human activity was routinized and habituated, but people also possessed the ability to cognize those routine actions and creatively modify them. Daily activities are precisely the place in which we can investigate the decision-making processes that are materialized in loci of production, distribution, and consumption. For ordinary people as well as elites, the relationship among food, objects, and work is one that involves constant fine-tuning, thinking, planning, and energy expenditure on the part of individuals. The cognitive elements used in daily activities were active in deepest prehistory and were the component, sustaining parts of social complexity.

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