

3 Return to *Ánosin Téhuli*? The origins of Puebloan culture

The first world, *Ánosin Téhuli*, was too dark and small. So the Twin Children of the Sun made some grasses grow taller and more robust, creating a ladder upon which all creatures could climb into the second world, *K'ólin Téhuli*. Populations in *K'ólin Téhuli* again grew so rapidly that yet a third world, *Awisho Téhuli*, was needed, but once again there were too many people. They therefore divided into different tribes, forming distinctions that became most apparent as they ascended into the fourth world, *Tépahaian Téhuli*. Eventually, the Twins led all the different nations and animals upward toward the light, into the current world, *Ték'ohaian Úlahmane*, the Daylight World (Cushing 1896).

According to the *chimik'yanakona penane*, the Zuni origin story, many different groups of people have existed since the beginning of time. Each made a similar journey through successive worlds in which they acted and looked differently, before migrating across the Daylight World and arriving at the spot where they live today. The Zuni accordingly recognize that their current world only makes sense in reference to this past history that shaped them (Ferguson and Hart 1985). In its own way, archaeology tells a very similar story, and its lessons are the same – any given moment in human history is the product of everything that came before. This chapter, then, establishes the foundations for our story of the Puebloan people.

Paleoindians: the earliest people of the Southwest

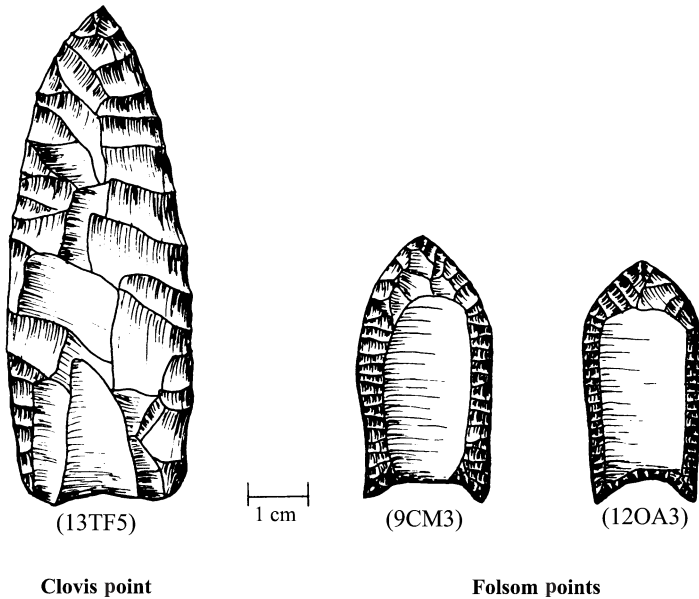
The earliest inhabitants of the American Southwest, whom archaeologists call the Paleoindians, lived in an environment utterly unlike that of the modern Southwest. The climate, the vegetation, the animals – every aspect of the late Ice Age was so different that we could, indeed, consider it to have been a different world (Elias 1997). The climate was moister and more stable than today – more rainfall fell and summer temperatures were lower, while winter temperatures were similar to or even warmer than today. Areas that are now deserts were grasslands, woodlands occurred at

much lower elevations, the highest elevations were covered permanently with ice and snow, and surface water was more plentiful. Available game animals included “megafauna” such as mammoths, mastodons, giant sloths, and *Bison antiquus*, huge creatures perhaps half as large again as modern buffalo.

The timing of the initial movement of people into the New World is one of those interesting questions that for many years appeared to be answered, then underwent a major revision and was thought to be solved, and now is being questioned again (Dixon 1999; Feidel 1999, 2000). Although much of the available evidence is still consistent with the interpretation that Clovis people were the earliest inhabitants of the New World, a growing body of data casts serious doubt on that view. A number of meticulously excavated and carefully dated sites in both North and South America indicate pre-Clovis occupation dating to 20,000 years ago or even earlier. For the Southwest, however, the earliest widely accepted dates for Paleoindian begin about 13,000 years ago, and the Clovis people are still recognized as the earliest inhabitants of the region; no older tools have been found (e.g., Sanchez 2001; but see Chrisman *et al.* 1996).

The Paleoindians were highly mobile people adapted to the game-rich environment of the Southwest (Haynes 1980, 1991). They had the skill and technology to kill very large and dangerous animals (Figure 3.1), but they appear to have hunted herd animals such as camel and horses as well as other smaller species (Agenbroad 1990). They also undoubtedly collected plentiful plant resources such as cactus fruits and piñon nuts. Group size was small during most of the year, perhaps no more than forty people, although occasional gatherings of larger groups for feasting, trading, and exchanging information were important, both economically and socially. Based on analogy with similar ethnographic societies, leadership positions were based on seniority, kinship, and personal skill in activities such as hunting or curing. The decisions that a leader advocated would be weighed by the group according to his or her perceived skills and previous success at making good decisions.

As the ice sheets began to retreat to the north some 14,000 years ago, the climate in the Southwest grew drier and exhibited greater seasonality (Figure 3.2). Many of the largest game species, as well as horses and camels, became extinct. Perhaps this was because they could not adapt to the climate changes, but some researchers (Martin 1973; Martin *et al.* 1985) argue that Clovis hunters were also responsible for the megafauna extinctions. Meanwhile, more modestly sized game animals, such as bison, adapted by shifting their ranges farther north or east, moving beyond the boundaries of the Southwest.

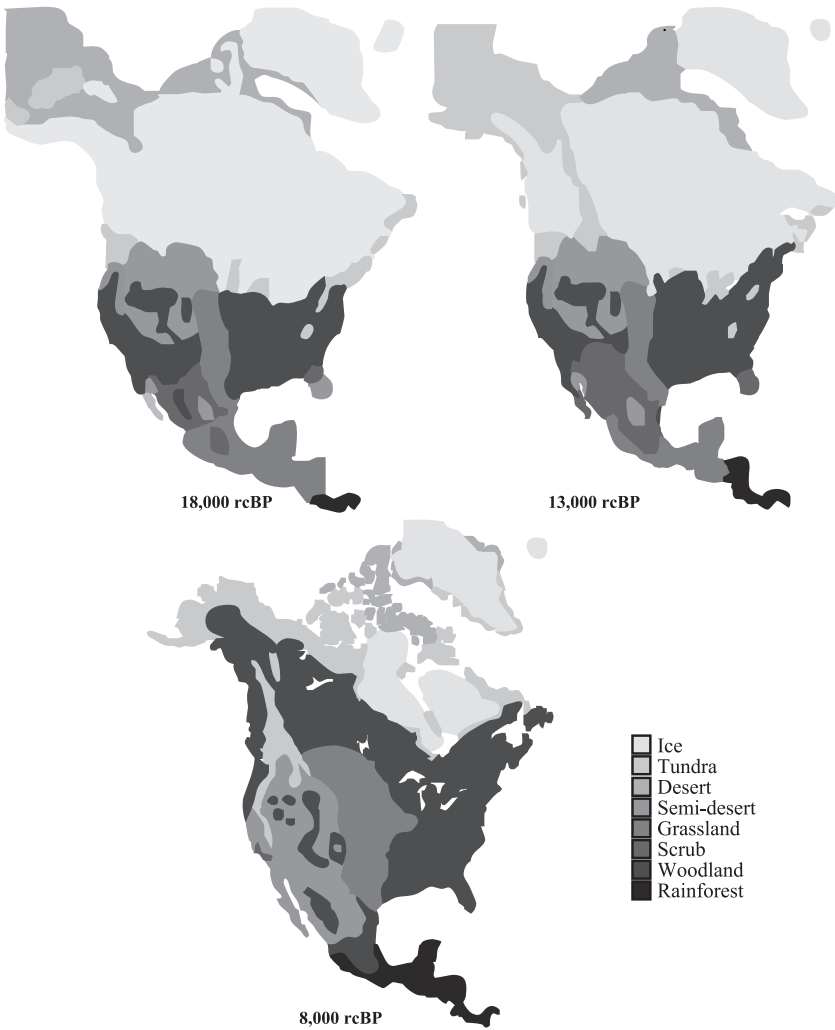


3.1 The size and workmanship of Paleoindian spear points make them easy to identify in the archaeological record; other food-gathering tools, such as those for gathering plants, are more elusive.

Because of this extinction and exodus of larger animals, Clovis culture faded as the large game disappeared. In the eastern parts of the Southwest, Clovis was followed by Folsom, Paleoindian people whose hunting strategies were focused on the now extinct *Bison antiquus*, and by later Paleoindian complexes that primarily hunted *Bison bison* and other still extant species. The latest Paleoindian complexes are most common in the northern Great Plains but are rare to nonexistent in most of the Southwest, where Holocene conditions no longer supported large herbivores.

The Archaic foraging adaptation

As the Holocene progressed and the Southwest environment changed, Paleoindian people no longer could rely on large herds of big game. For those people who did not follow these animals east on to the Plains, they had to change their diets, toolkits, and traditions to contend with the smaller animals and scattered stands of edible plants that took over the Southwestern landscape. By about 5500 BC, the region was occupied widely, though thinly, by people whose new lifeway is referred to as



3.2 Paleoenvironmental reconstructions of the Pleistocene–Holocene transition, illustrating the rapid changes that contributed to the megafauna extinctions.

“Archaic.” If stability is evidence of adaptive success, the Archaic people were the most successful people in the history of North America, for their way of life continued largely unchanged for at least 5,000 years. Indeed, in some places, the Archaic lifeway continued until European contact.

Sandwiched between the Paleoindians, with their beautiful spear points and exotic Ice Age game, and the pre-Contact Pueblos, with their aesthetically pleasing pottery and evocative ruins, the Archaic people have tended to be short-changed by archaeologists. Generally, the Archaic has been treated as if it constituted an extremely long prelude on the way to sedentary and more complex societies. Studies of Archaic cultures in the Southwest have most often focused on the origins of farming (e.g., Hogan 1994; Huckell 1995; Matson 1991) and the antecedents of the Anasazi, Mogollon, and Hohokam cultures (e.g., Irwin-Williams 1973; Sayles 1983; Sayles and Antevs 1941). Fortunately, a small but dedicated set of archaeologists have devoted considerable effort to studying the Archaic for its own sake (e.g., Huckell 1996; Irwin-Williams 1967).

Archaic people were hunters and gatherers whose specific adaptations depended on the nature of locally available resources. Botanical and faunal remains reveal a very broad diet and leave the impression that Archaic people made use of virtually every edible plant and animal in their environment, including some that we probably would not classify as "edible." Plant foods were a significant component of the diet, along with both small and large game animals. The Archaic toolkit was designed to be very flexible and adaptable, so that its users could find and process any and all edible parts of their landscape. Grinding stones for processing seeds and nuts, stone projectile points hafted to wooden shafts and thrown using a wooden spear-thrower, and a variety of chipped stone tools are common parts of the toolkit. Excavations in dry rockshelters, where normally perishable materials are often preserved, indicate that people also made a wide range of baskets, cordage, nets, and bone and hide items.

Archaic people were highly mobile, with frequent residential moves, relatively simple material culture, and generally ephemeral dwellings that left few remains in the archaeological record. As with the Paleoindians, day-to-day group size was small, and leadership positions were situational and based on skill as well as age and kinship. Periodic larger gatherings are likely, but archaeologists have yet to find any sites indicating sustained use by large social groups until after the advent of farming (Huckell 1996:351; Wills 1995:234–5). Archaic populations were very flexible, however, and groups combined and fissioned in response to opportunities and stresses in their social and physical environment. The combination of conservative material culture traditions, high mobility, and great time depth created complex patterns of interaction reflected in the Archaic archaeological record: although subtle regional trends in material culture can be

identified (e.g., Geib 2000), Archaic people throughout the Southwest are characterized by a fair degree of homogeneity.

The introduction of cultivated plants to the Archaic diet

The beginning of the end for the Archaic way of life appeared in the form of a plant imported from the south as long ago as 2000 BC (Smiley 1994; Wills 1995). This domesticated version of a wild grass native to highland Mexico was a botanical oddity (Box 3.1). It was unable to grow and propagate itself with any degree of success, but if planted in fertile, well-watered ground, it yielded abundant edible seeds on a very dependable basis. Like so many events that in hindsight seem so momentous, maize probably did not seem like a big deal at the time. The ambivalence that Archaic people felt toward maize is reflected in the considerable length of time between its first introduction into the Southwest, its slow spread north by 1200 BC (e.g., Gilpin 1994), and the eventual emergence of a truly farming lifestyle several hundred years later. At first, Archaic people planted small plots of maize that they left alone while they continued their seasonal moves to collect wild foods. In the fall, they would perhaps return to see if there was anything to harvest, and they might store away the dried maize to use in case of emergency (Rocek 1995; Wills 1988, 1995).

Maize was no big thing. But the seductive part was, the more care and attention you gave it, the better it produced. Perhaps you might have a run of bad luck in hunting and gathering wild foods, and so you plant a little more maize in the spring. Worried about having another bad year, you dedicate more attention to your small garden, returning perhaps a few times during the growing season to care for it. You still prefer the taste of the wild game and gathered plants, but, in the unstable Southwestern climate, you might care more and more about the one food source you do have a little control over. Year after year, growing maize – and perhaps some squash, also borrowed from highland Mexico – takes up more of your time, with less left over to gather and hunt. By the turn of the millennium, people were constructing simple irrigation ditches in the southernmost parts of the Southwest, demonstrating their increasing investment in domesticated crops.

Toward the end of the Archaic period, people gradually expanded both into upland areas as well as down into the valleys and basins. On the Colorado Plateau, in locations ranging from the massive sandstone cliffs of Utah to the drainages below the San Juan Mountains, these people are known as “Anasazi Basketmaker” owing to their increasingly elaborate basketry and textiles. Farther to the south, in the Mogollon Highlands,

Box 3.1 Mesoamerica's domesticated plants

The first cultigens to enter the Southwest are collectively referred to as the Upper Sonoran Agricultural Complex, which consists of maize, beans, and squash. Over many generations, these plants were manipulated to exhibit traits desired by humans – more food energy and greater ease of harvesting – at the expense of their natural ability to prosper in the wild. By at least 6,000 years ago in what is now central Mexico, maize was “domesticated,” with the other two plants following soon after. Soon, cultivation of these “three sisters” spread.

The timing of the appearance of these cultigens in the American Southwest is a topic still explored by researchers (Smiley 1994; Wills 1995). While maize found in the Sonoran Desert of southern Arizona dates back to at least 1500 BC, the oldest, best-dated maize in the Puebloan Southwest dates to 1400 BC, from Tornillo Rockshelter in the Chihuahuan Desert. In the Mogollon Highlands, maize remains dating to around 1300 BC were recovered from the oldest deposits of Bat Cave. The earliest cultigens found in northern parts of the Southwest include squash rinds from Chaco Canyon that date to 1000 BC. The evidence available so far suggests that maize first appeared in the Sonoran Desert and spread rapidly through the Southwest. Maize and squash were apparently introduced together in most areas, while the common bean entered later, perhaps before 300 BC.

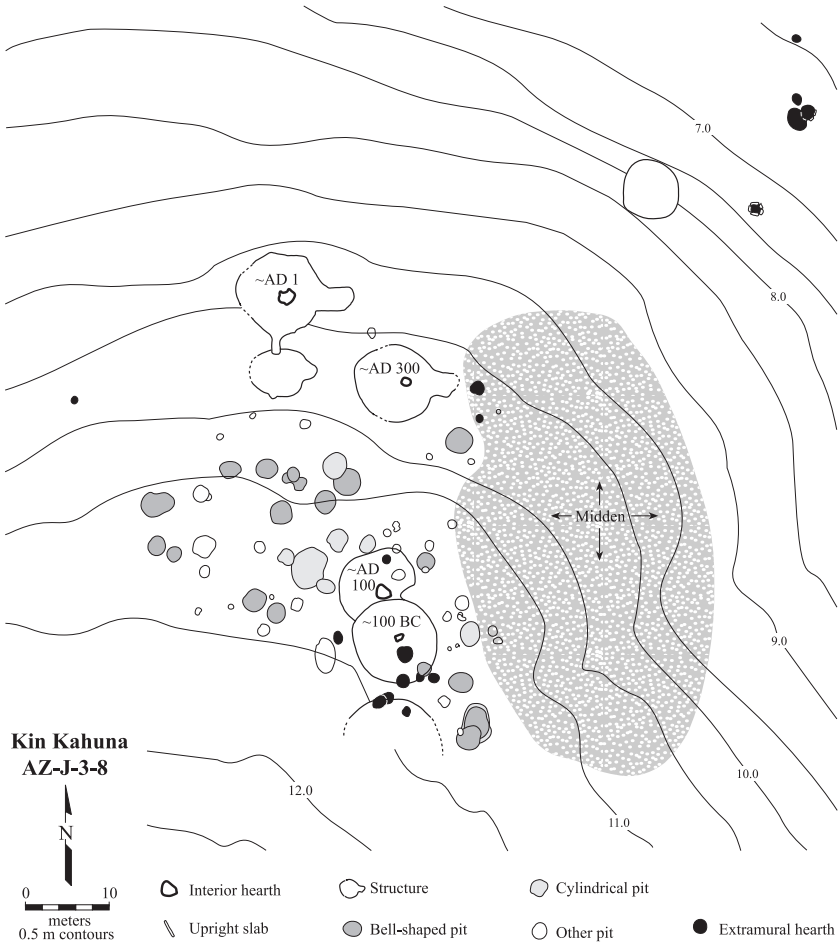
The introduction of domesticated plants to the Southwest has been described as “a monumental nonevent with little immediate impact on native human populations” (Minnis 1985:310). The first maize cultivar to enter the Southwest was a Chapalote 12- to 14-rowed popcorn – the more rows, the smaller the kernels, and these kernels were hard, not unlike the popcorn kernels we know today. It was not very productive and did not contain the nutritious flour endosperms characteristic of later varieties. Furthermore, within a few centuries, the Chapalote maize introgressed with teosinte grass in the Sonoran Desert, resulting in an unpredictable hybrid. There is therefore no reason to assume that people eagerly became dependent upon this undependable and unproductive resource.

people known as the “Mogollon” pursued similar lifeways, relying on foraged foods but also planting some crops. Perhaps because of greater numbers of people, or perhaps because of the increased focus on farming, Basketmaker and early Mogollon populations moved around the landscape less and less. But were they truly sedentary? Did they live in villages as we think of them today, with full-time residence in permanent homes? And, most importantly, how did this impact their social interactions and political lives?

The beginnings of village life

Archaeologists identify subterranean pithouses as the first residential structures in the Southwest. Their appearance long pre-dates the introduction of maize. An Archaic-era pithouse on the Chama River in northern New Mexico, for example, may be as old as 3200 BC and was accompanied by ground stone and large pit hearths for roasting food. Several pithouses found in the lower Rio Grande drainage date as early as 2700 BC and two possible structures along the Rio San José in west-central New Mexico could date back to 2700 BC (Huckell 1996; Whalen 1994; Wills 1995). Pithouses were a successful adaptation to any environment and any season, for they provided protection from both heat and cold. Distinct clusters of a dozen or more pithouses are regarded by some archaeologists as the earliest “villages” in the Puebloan Southwest (Figure 3.3) (Dohm 1994).

But are these pithouse clusters really the earliest sedentary villages in the Southwest? To address this question, Patricia Gilman (1987) compiled data from pithouse dwellers around the world and concluded that most people residing in pithouses are seasonally mobile and subsist on a wide variety of foods. She further examined Basketmaker pithouses on Black Mesa and found that storage pits were usually located outside the structures, where they could be easily hidden when the pithouses were temporarily abandoned. Gilman therefore concluded that early pithouses were winter habitations built by groups with a relatively low dependence on farming. A similar study considered Shabik’eshchee Village in Chaco Canyon (Wills and Windes 1989), which consisted of two groups of pithouses separated by a wash. Investigation focused on the nineteen pithouses in the southern cluster. Some were superimposed on older dwellings, while others had been partially dismantled to obtain material for the new construction, indicating frequent use and abandonment of the “village.” Surrounding the pithouses were over forty-five storage features. Researchers concluded that these were used for caching food supplies when the dwellings were seasonally abandoned. Basketmaker



3.3 The Kin Kahuna site includes several pithouses and numerous hearths and storage pits that were used from 400 BC to AD 400; the site continues to the south, where archaeological investigation was not conducted.

and early Mogollon villages, therefore, were not the kind of “village” that we think of today. Instead, these were locations where a few families might gather during one or two seasons.

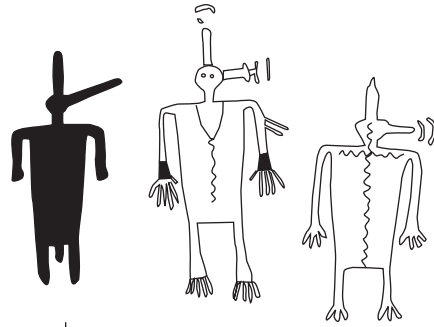
Sedentism and farming

By 1000 BC – probably earlier in the Mogollon Highlands and a few hundred years later on the Colorado Plateau – maize cultivation began

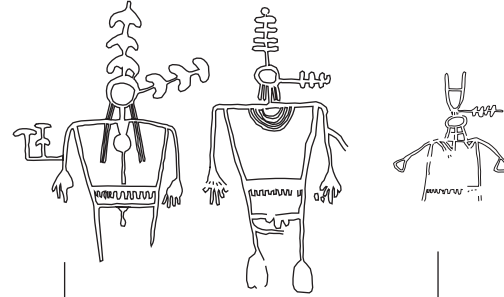
significantly to impact the Archaic lifeway, creating a mixed farming/foraging way of life that lasted into the early centuries of the new millennium. Investment in weeding, predator control, and other farming activities increased yield and dependability of maize, which then led to increased storage and increasing sedentism. Sedentism in turn limited the available range of wild plant resources, leading to increased dependence on maize horticulture. And increasing sedentism, combined with the availability of maize-based weaning foods, meant that less time was needed between births, which encouraged population increase – further increasing dependence on maize, the most productive resource. The feedback loop between sedentism, farming, and population growth led to remarkably rapid changes. Accelerating the process was the arrival of ceramic technology sometime during the last few centuries BC (Heidke 1999). Pottery made maize easier to prepare and securely store, and dried foods could be rendered edible through lengthy boiling (Crown and Wills 1995; Skibo and Blinman 1999).

The increasing sedentism at the turn of the millennium created the kind of regionalization that was *not* characteristic of earlier Archaic peoples. In southern Arizona, in the Mogollon Highlands, and on the Colorado Plateau, populations exhibited similar adaptations as they turned to farming, but they also began to develop more distinctive material culture. Pithouse forms differ from region to region, suggesting networks of exchange or perhaps even early ethnic boundaries. Changes in basketry and rock art suggest that people intentionally created designs that communicated their distinctive identities (Figure 3.4). A review of early Basketmaker rock art across the Four Corners, for example, revealed that headdresses on anthropomorphic imagery were distinctive, with different areas exhibiting their own unique decoration (Robins and Hays-Gilpin 2000). Similar studies show that the most elaborate basketry designs appear on bags and baskets, items that were readily visible during social interactions and therefore most effective at communicating social identity (e.g., Webster and Hays-Gilpin 1994). Early pottery is simple and undecorated, but beginning in the AD 500s elaborate designs paralleling those found on basketry began to be painted on pottery on the Colorado Plateau (Reed *et al.* 2000).

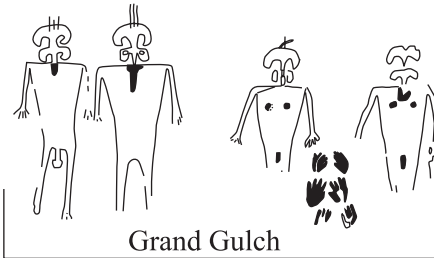
By the first few centuries AD, most of the larger pithouse clusters were sedentary villages, although some mobility is considered still to have been a necessary adaptation to the vagaries of Southwestern climate (Diehl and LeBlanc 2001). A sedentary lifestyle oriented around farming has a number of important consequences. People no longer could benefit from the flexibility of a foraging lifestyle, simply moving to a new location when local resources were used up. Although cultivated crops provided a consistent source of food during good times, farming always required a



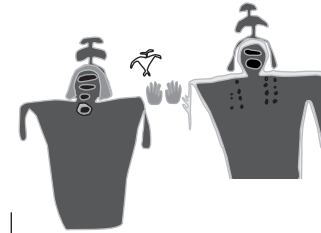
Canyon de Chelly



Butler Wash



Grand Gulch



Moqui Canyon

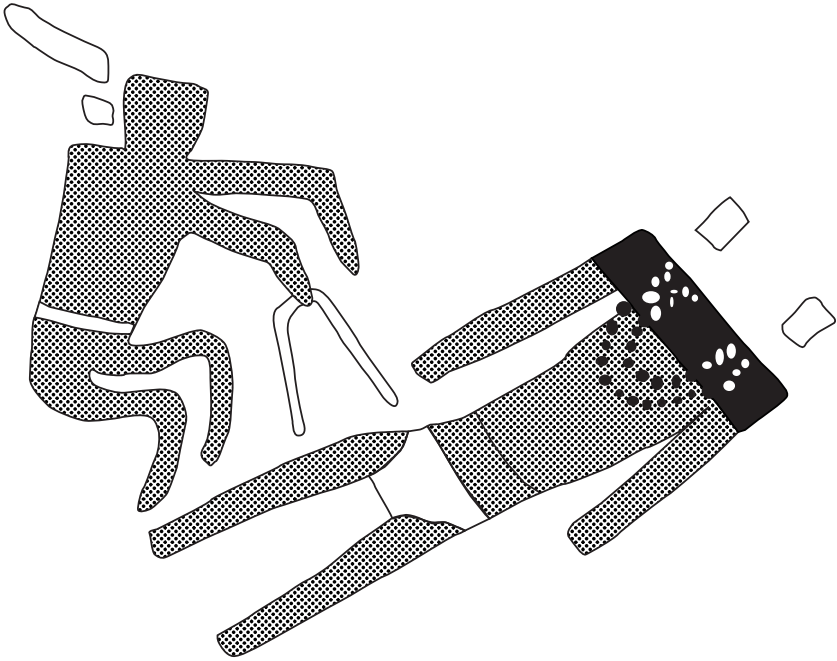
3.4 Rock art found in different areas of the Colorado Plateau tends to exhibit distinctive head-dresses.

considerable investment of labor. Most early farmers relied on rainfall – a technique known as “dry farming” – so if the rains failed to come, people had to work even harder, hand-carrying water to their crops. People in most parts of the Southwest soon learned that the key to success was to overproduce: plant as much as possible, perhaps in a number of fields, so that they would have at least some food come harvest time. Extra crops – especially maize, which could be dried – could be stored to help people get through tough times. Not surprisingly, then, pithouses became more elaborate, with antechambers and internal storage areas added. A row of large storage cists, many of which were room-sized and lined with stone, began to be built behind the pithouses to spirit away additional surpluses.

Life in a pithouse village

Most archaeologists agree that social and political organization in pithouse villages was becoming more elaborate as larger numbers of people began to live together year-round (Reed 2000). Successful farmers occasionally help one another, to share ideas, labor, and sometimes surpluses. Exceptionally large pitstructures found in some villages therefore are often interpreted as “integrative facilities,” public architecture whose function included the accommodation of community-wide events. Found from the southern Mogollon into the northern Basketmaker areas, these large circular structures lack domestic features such as storage pits, but do feature benches lining the walls that allowed large numbers of people to sit at the same time, and a large firepit is usually found in the center of the floor (Nelson 1999:32; Wills 1989). Unusual artifacts are found in these structures, such as caches of old Archaic spear points and other odd stone items (Kearns *et al.* 2000). Ceremonial events attended by entire communities probably occurred in these public buildings. These events played an important role in affirming village ties, not just between community members but also with guests from other villages.

What kinds of ceremonies did pithouse dwellers organize? While we will never know for certain, tantalizing clues can be found in the archaeological record. During the Archaic and early pithouse times, when people were still fairly mobile and relying on wild foods, religious life was probably oriented around what anthropologists call “shamanism.” Shamans, or medicine men, are individuals with purported supernatural gifts that provide them with some control over the spirit world. They are especially skilled at dealing with illnesses, especially those caused by witches or harm-causing spirits. Shamans in action appear to be represented in some Basketmaker-era rock art panels (Figure 3.5), and bird iconography



3.5 This Basketmaker pictograph from Canyon de Chelly has been interpreted as a shaman healing a woman, although alternative explanations include a puberty event.

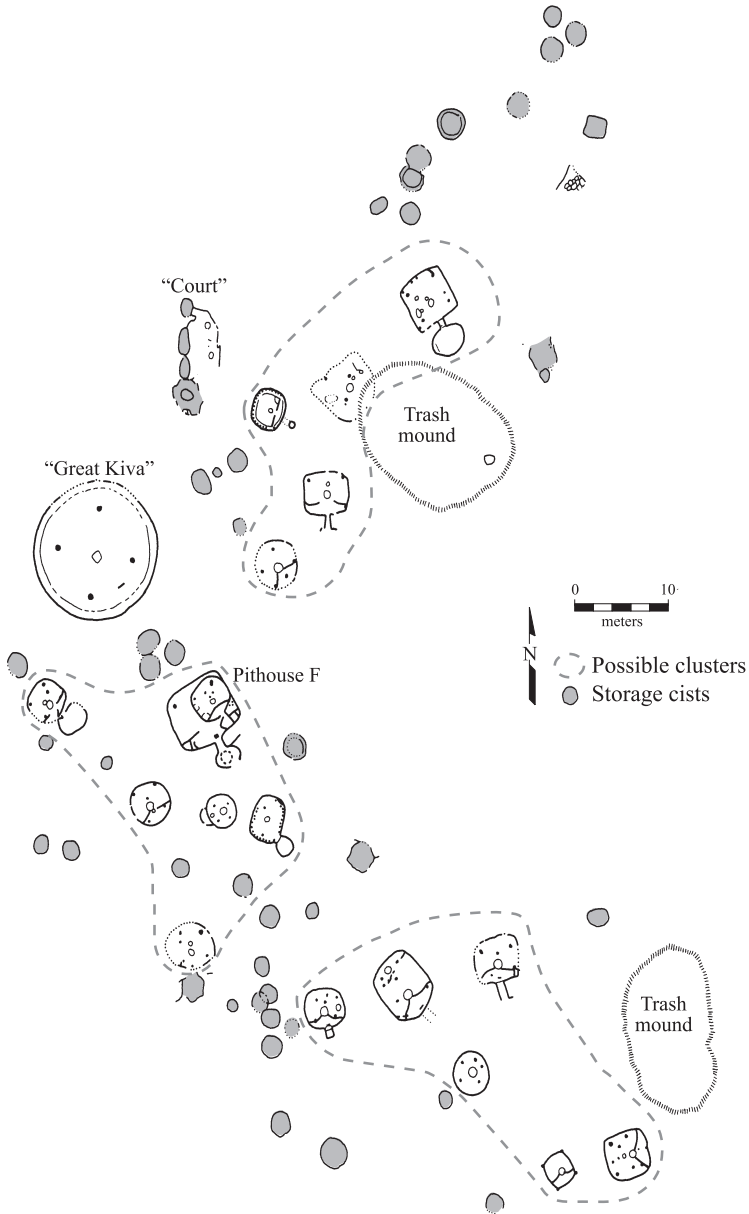
may symbolize magical shamanic flight or bird spirit helpers (Robins and Hays-Gilpin 2000).

The emergence of a more settled way of life oriented around farming shifted attention away from shamanic ritual. Medicine men and individual healing never disappeared; they are still a part of indigenous Southwestern life even today. But people increasingly became concerned with favorable climatic conditions and communal well-being, both of which were needed to be successful sedentary farmers. Rock art, basketry, and pottery from this era often illustrate rows of people holding hands or engaged in ritual together, and animals associated with water, such as ducks and cranes, are more common than in earlier periods (Robins and Hays-Gilpin 2000). At this time, a rigid ceremonial calendar tied to the cycle of planting and harvesting may have emerged. With these changes, shamans were probably supplemented by priests, individuals with no supernatural power of their own, but rather authorities who kept track of the ceremonial calendar, who memorized the proper rituals, who

supervised village-level decision-making, and who played important roles in guiding relationships beyond the village (Reyman 1987).

In a study of Puebloan pithouse villages, Kent Lightfoot and Gary Feinman (1982; Feinman *et al.* 2000) argue for the presence of authority-based community leaders by AD 600. They point to the larger size of some individual pithouses, as well as their greater storage capacity and inordinate quantities of non-local goods – at Shabik’eshchee (Figure 3.6), for example, the largest pithouse, located in front of the village’s ceremonial pitstructure, contained a number of unusual artifacts, including turquoise (Roberts 1929:142, 153). According to this view, leaders occupying modestly larger pithouses were not able to command others to do their bidding, but rather did their best to persuade others to help them, relying on a combination of outright charisma, well-targeted gift-giving, the cooperation of their family and friends, and perhaps their roles as village priests. Known in anthropology as “Big Men,” this kind of leadership was always a tenuous affair. Incipient leaders could, however, strengthen their authority by tying themselves to the ceremonial pitstructures, perhaps by mustering their supporters to build the structures or to sponsor ceremonial feasts, ostensibly to benefit the village as a whole but undoubtedly enhancing the sponsor’s own status and prestige (Figure 3.6). Thus it is not surprising that in at least some of these early villages, the biggest pithouse homes were found near large public structures (e.g., Damp and Kotyk 2000:111; Feinman *et al.* 2000:462).

The weakness of authority-based leaders may be revealed by the post fences built around some of their purported residences (Damp and Kotyk 2000), perhaps a measure to protect the few goods that they were able to spirit away for themselves or that they were accumulating for a particularly ostentatious ceremony. On the other hand, some archaeologists refer to these as “palisades” that served as a defense against village raiding rather than a deterrent against pilfering by neighbors (e.g., Chenault and Motsinger 2000). An assessment of violence in the pre-Contact Southwest by Steven LeBlanc (1999) in fact concludes that many early Puebloan villages were placed in defensive settings and built to repel simple raids by other groups intent on stealing food, capturing women and children, or exacting revenge for some actual or perceived wrong. Before the modern era, such low-level endemic warfare was an occasional occurrence in small-scale societies all over the world, and it is often associated with the beginnings of village life and farming. It should therefore not be surprising to see evidence for it in the Puebloan Southwest. While this kind of conflict was infrequent, we can imagine that it affirmed the authority of aspiring leaders who played a role in organizing village-level responses to external threats. Perhaps a palisade around the home of a



3.6 In Shabik'eshchee Village, Pithouse F not only is the largest habitation, and not only is located close to the communal pit structure, but it also contained an inordinate quantity of rare artifacts, including turquoise. Different pithouse clusters likely represent episodic use by distinct semi-sedentary groups. About half of the village, located less than 50 m across a drainage to the north, is not mapped here.

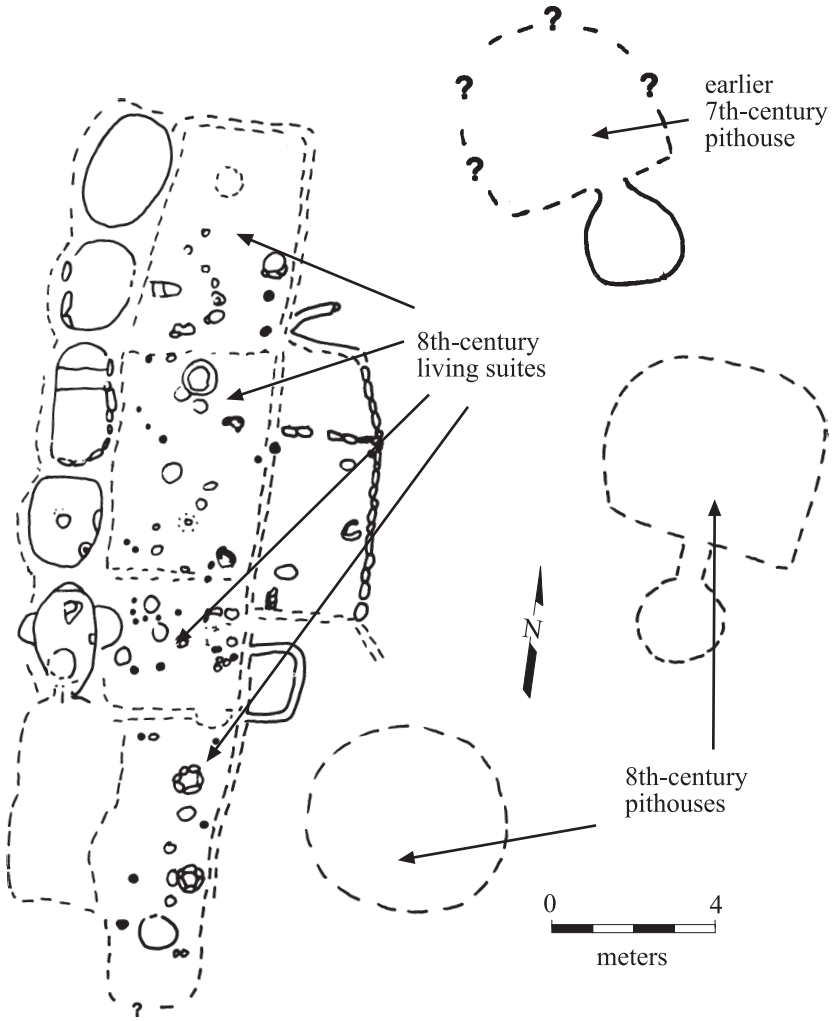
priestly leader – and the privacy and status the fence provided – was seen as legitimate owing to the special ceremonial items that were stored there.

Villages and pueblos: the foundations of Puebloan culture

During the AD 600s, a highly productive variety of maize began to be grown that had a profound impact on pithouse village evolution in the Puebloan Southwest. This new variety, called Maiz de Ocho, featured larger kernels, fewer kernel rows, and earlier flowering. In marked contrast to the Chapalote popcorn that people first adopted from highland Mexico, Maiz de Ocho had more food energy owing to its floury endosperm, and it was easier to grind. For a long time, archaeologists believed that Maiz de Ocho developed in Mesoamerica and diffused into the Southwest, but rockshelter deposits in the southern Mogollon region show a gradual indigenous evolution from the earlier Chapalote to the Maiz de Ocho (Upham *et al.* 1987). This suggests that Southwest farmers consciously selected plants that produced larger kernels and flowered earlier. It is not too hard to figure out why they would do this – larger kernels are much easier to grind, especially for people who are relying more and more on dried and stored surpluses. Experimental data indicate that the selection of larger kernels also led to a decrease in kernel row number and earlier flowering. And in turn, earlier flowering allowed people living at higher, moister altitudes with shorter growing seasons to grow maize successfully. Clearly, Southwestern groups were becoming quite adept at manipulating cultivated plants to serve their needs, and other locally adapted varieties soon followed Maiz de Ocho.

Pueblo architecture emerges

The appearance of highly productive, drought-resistant, and early flowering maize varieties corresponds with rapid changes on the Colorado Plateau, where populations had tended to mirror trends set by the Mogollon groups to the south. With the development of new cultigens better suited to their environment, Basketmaker people began to set their own trends, and they started by constructing above-ground architecture – Mogollon people would not make this move for a few hundred more years. Initially fabricated of upright stone slabs and *jacal*, a wattle-and-daub construction technique, surface rooms were later built with dry-laid and unshaped masonry (Figure 3.7). This surface architecture replaced the row of stone-lined cists associated with earlier pithouses, suggesting that the shift to “pueblo” architecture was related to an increasing need for storage. In Patricia Gilman’s study of world-wide architecture



3.7 This eighth-century habitation in Chaco Canyon, known as Site 627, included two pithouses backed by an above-ground structure that featured a row of living rooms backed by a second row of storage rooms. Construction was primarily of *jacal*, or wattle-and-daub, in which walls are made of posts intertwined with brush and plastered with mud.

(Gilman 1987), she found that the shift from pithouse to above-ground structures in most societies was highly correlated with agricultural intensification and the production of surpluses requiring storage. In contrast to subsurface storage pits, foods stored in jacal or masonry rooms are less susceptible to moisture and vermin and can therefore be stored for longer. Above-ground storage facilities are also clear evidence of sedentism, for these rooms were vulnerable to pilfering if left unguarded for any length of time.

The increased need for storage was not just due to the appearance of productive varieties of maize. Beginning in the AD 700s, the Southwest experienced worsening climatic conditions (Grissino-Mayer *et al.* 1997; Gumerman 1988). Rain came less frequently, and springs began to dry up as water tables fell. When rains did come, they were often violent storms that eroded waterways and farmlands. And the precipitation was more unpredictable, both from season to season and from year to year. In the face of these problems, the best solution for farmers was to produce and store as much food as possible, ideally so that they could get through a year or two of poor crop yields. Large, dry surface rooms therefore were needed to store large quantities of surpluses safely.

We might expect that village dwellers would have moved into pueblo rooms alongside their storage facilities, but this did not happen right away. In fact, except during inclement weather, interior spaces were infrequently used throughout Southwest history. Imagine what these spaces were like. As you entered a pithouse or pueblo room, you would notice the lack of windows and the small, protected doorways. Once inside, the spaces were dark and stuffy, and lighting a torch or building a fire caused them to become smoky. Daily activities, therefore, from grinding maize to making stone tools to weaving clothing, most often occurred in the village's open plaza areas. During hot weather, people might take refuge under *ramadas*, open-walled structures with simple roofs built to provide shade. Cool winter weather or monsoonal summer rains might drive people into their pithouses, but even then you might prefer to bundle up and brave the weather rather than inhale the smoky air of the confined interior spaces.

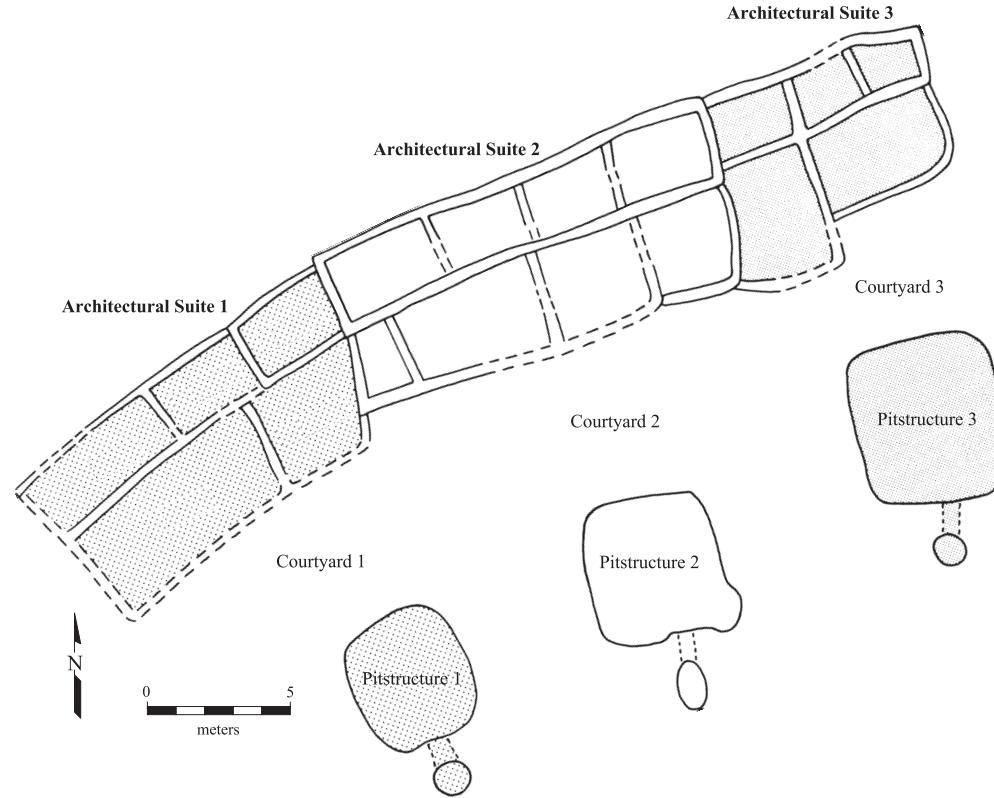
During the AD 700s and 800s, people on the Colorado Plateau built their pithouses deeper into the ground and began to include fewer domestic features and more features used in ritual activity. Many pithouses were now more circular, and a ventilator shaft replaced the antechamber. Occasionally, a small hole was dug into the floor, which in modern Hopi society is known as a *sipapu*, a symbolic entrance to the spiritual world. Despite these arguably ceremonial features, however, many scholars believe that pithouses were probably still used for domestic activities

(e.g., Lekson 1988). These small pitstructures with ceremonial features are therefore referred to as *protokivas* owing to their ambiguous nature, halfway between fully domestic pithouses and the subterranean ceremonial *kiva* still used by Pueblo people today. Surface rooms were typically built as a single-story arc behind the protokiva, forming what is often known as the “Prudden unit pueblo,” named after T. M. Prudden, one of the fathers of Southwestern archaeology. The row of storage rooms was soon fronted by a second row of domestic quarters. Puebloan communities consisted of clusters of these roomblocks, often accompanied by one or more oversized pitstructures that continued as the locus of ceremonial and communal activities. The size and growth of these villages is unfortunately difficult for archaeologists to track; several studies have shown that the average Puebloan habitation was occupied for only thirty to fifty years (Varien 1999; Wilshusen and Ortman 1999), at which point people simply built a new home nearby, often using materials salvaged from their abandoned dwellings.

Pueblo households

What was life like in these early pueblo communities? When archaeologists consider earlier pithouse villages, the small size of the structures suggests that households were small, perhaps consisting of a classic nuclear family of mom, dad, and the kids (e.g., Diehl and LeBlanc 2001:117). As people became more sedentary, however, villages began to show distinct spatial organization indicating that related households were building their pithouses close to one another. At the Mogollon village of Old Town, for example, archaeologist Darrell Creel identified small groups of pithouses facing one another across a small open plaza (Nelson 1999:32; see also Diehl 1998:631). The development of pueblo architecture marks the clearest evidence for extended family households, which could include a few nuclear families from multiple generations – grandparents, their children and *their* spouses, and all of the grandchildren. At Duckfoot (Figure 3.8), an early pueblo site on the Colorado Plateau, archaeologists excavated four pithouses backed by two rows of rooms divided into three distinct sections, each probably used by an extended family (Lightfoot and Etkorn 1993; Varien and Lightfoot 1989).

The growth in household size as people settled into a sedentary farming lifestyle provides insight into other aspects of their social organization. Scholars generally believe that the earlier mobile hunter-gatherers in the Southwest – as elsewhere in the world – were loosely oriented around patrilineal or ambilineal kin relationships in which one’s kinship was determined either through the father’s line or through both parents



3.8 The Duckfoot Site was built in the AD 850s and occupied by three extended-family households, each with its own pithouse and section of pueblo rooms. A fourth pithouse was added in the AD 870s, before the entire habitation was abandoned around AD 880.

(Hunter-Anderson 1986). This kind of flexible organization is the hallmark of foraging societies, for it allows them to respond to unpredictable environmental conditions, quickly calling upon their many kin relationships with other groups. If a gender is favored at all, male kinship is typically privileged, and when a man is married, he might bring his new spouse to live with his relatives. This is thought to be a sensible strategy for people whose lifeway is oriented around lengthy hunting trips undertaken mostly by men – this despite the fact that the bulk of calories are provided by gathered plants and smaller animals, a task attributed to women. A typical foraging band therefore consists of a core group of related men and their spouses, as well as a number of other people who come from other groups, drawing on the web of kin relationships that ties many bands together.

Archaeologists believe that, when Puebloan people began to settle down into villages to farm their fields, the focus of organization shifted away from a loosely determined kinship structure to one that was more strictly organized. Some scholars argue that this happened as arable land became more important – there is not a lot of it in the Southwest, largely owing to the lack of permanent water, and so gaining and retaining access to it became imperative. Timothy Kohler (1992a), for example, suggests that small fieldhouses began to be built on farmlands to demonstrate ownership of valuable plots. And once your family had control over good land, the best way to retain it was to ensure that it passed along a single, well-defined family line, excluding as many claimants to the land as possible (Hunter-Anderson 1986:43).

Associated with greater control over land was an apparent shift from a male emphasis to a kin structure centered on women, one in which rights to land and other resources were passed along the female line. Why this would happen is not exactly clear. It may be that plant resources and knowledge of the lands that produced them had long been the venue of women, and as cultivated plants became increasingly central to the diet, kinship shifted from patrifocal to matrifocal. Another argument is that men were the more unsettled gender; they continued to emphasize hunting to obtain meat (Box 3.2), they undertook long-distance trading journeys, they engaged in occasional raids, and accordingly, they died more often (Peregrine 2001:38). Men also were apparently more involved in the elaborate ritual life of the community (e.g., Mobley-Tanaka 1997; Robins and Hays-Gilpin 2000). The crops required continual maintenance, and although men no doubt assisted in farming, women probably had the burden of responsibility to maintain the fields. And women were responsible for managing the surpluses, especially for determining when and with whom to share extra food. Whatever the exact reasons, the

Box 3.2 Domesticated animals in the Southwest

None of the indigenous fauna of the Southwest ever was domesticated. Perhaps animals such as deer, antelope, and rabbits were not amenable to the confinement and selective breeding that led to animal domestication in other parts of the world. The only domesticated animals that appear in the Southwest archaeological record are dogs and turkeys, both of which were probably introduced to the region.

Although debated, the evidence suggests that no wild turkeys existed in the Southwest prior to the first millennium AD. Charmion McKusick (1986:3) argues that the first turkeys to enter were a small breed that was domesticated along coastal eastern Mexico. It was highly dependent on humans and not capable of surviving on its own. By AD 500, a larger turkey – also already domesticated – appeared in the Southwest, perhaps from the east. Some became feral, establishing the wild population of Merriam's Wild Turkey seen in the region today. As Puebloan people became more sedentary, both the small and large domestic breeds were kept in pens, and the wild turkeys were hunted. Anecdotal evidence suggests that turkeys – particularly the smaller breed – were raised for their feathers to make robes, and McKusick (2001) also argues that they were sacrificed and ceremonially buried in times of crisis. Later, after the tenth century, both the larger domestic breed and wild turkeys were used more frequently for food and making bone tools. Turkeys also were useful for managing insects that could damage crops, such as grasshoppers (McKusick 1986:9).

Dog remains are ubiquitous in archaeological sites across the Puebloan world. A number of breeds have been identified, including the Small Indian Dog and the longer-limbed Plains Indian Dog. Evidence of formal dog burial is seen at least back into the Archaic period, and burials dating to 8,500 years ago are found in other parts of the Americas. This preferential mortuary treatment suggests that dogs held a unique value to early Puebloan people, and no doubt they were used in a broad range of tasks, from hunting to guarding crops. Interestingly, however, formal dog burials decrease after AD 1200, and Richard Lang and Arthur Harris (1984:90) argue that the decline of hunting at that time diminished the value of dogs. At about this same time, dog remains appear in contexts and exhibit damage indicating that they were occasionally eaten (Olsen 1990:166). When Europeans first arrived, they described in detail the great flocks of turkeys kept by Pueblo people, but only passing mention is made of the small dogs that reportedly were kept in “underground huts.”

appearance of household clustering, first in pithouse villages and then later in pueblo architecture, is seen by many archaeologists as a shift from a somewhat loosely organized patrifocal society to a matrifocal society in which kin ties were becoming much more important and carefully monitored.

Although research on the internal organization of these communities is still in its infancy, a picture of early pueblo life is emerging. We can imagine a village with a couple of dozen pithouses, many clustered together as seen at Duckfoot and backed by one or two rows of pueblo rooms. Each cluster is a small neighborhood occupied by a matrilineal kin group oriented around a core of related women; their husbands came from elsewhere, perhaps even from outside the village. Different kin groups in the community probably share a number of bonds: the family lines of the women might cross, or at the very least some of the men from one kin group might all be married into another lineage.

And the pueblo village might include recent immigrants. The mobility of earlier times never went away. Even full-time farmers might find it necessary to pack up and abandon their homes, moving to new areas where they have distant relatives or where they might be welcomed as strangers. Many archaeologists note the variability of material culture in both late pithouse and early pueblo communities, with some suggesting that this reflects the immigration of families from different ethnic traditions (see summary in Vivian 2000). The distribution of ceramic designs in some areas shows abrupt spatial boundaries suggestive of strong ethnic symboling. In the Mesa Verde area, for example, Richard Wilshusen and Scott Ortman (1999) identified two different ethnic groups that maintained clear boundaries on either side of the Dolores River, with those on the west side exhibiting greater social and political inequities – as well as evidence of violent death. Farther south, in contrast, interethnic mixing appears even within single villages, suggesting a high degree of mobility for farmers in some regions (e.g., Reed and Wilcox 2000). This is a topic that still needs much archaeological research, but the general picture is that ethnic boundaries became more intensively symbolized as the pueblo era began.

Early pueblo politics

Archaeologists debate how decision-making and leadership were organized in early pueblo villages, but few studies have directly addressed the issue. We might expect that the trends identified for earlier pithouse villages continued into the pueblo era. Leaders were probably those authority figures – especially those religious authorities – who established their

fragile hold over decision-making through acts that enhanced their status and prestige, from making effective decisions to judiciously giving gifts to others who could help them achieve and maintain their positions. Decision-making was probably tied to the ceremonial structure of society, with authority figures perhaps gaining legitimacy through their roles in ritual, which provided a public venue for gaining individual and group prestige and influencing social and political relationships (e.g., Schachner 2001).

Two changes discussed above no doubt impacted the structure of leadership. First, the increasing focus on overproduction and the generation of surpluses provided aspiring leaders with the material means to expand their authority (Kantner 1999a; Sebastian 1992). Surpluses could be “loaned” to other community members, who then would become indebted. The surpluses also could be used to organize trading expeditions to other areas, where new alliances could be established and valuable items exchanged. Rare red-slipped pottery made by a few specialized producers in the Mesa Verde area (Hegmon *et al.* 1997), turquoise from discrete sources such as the Cerrillos area on the Rio Grande (Mathien 2001), and shell from the Gulfs of California and Mexico (Mathien 1997) were some of the items traded long distances that played roles in gift-giving and symbolizing prestige. And surpluses – as well as social debts – also could be invested in the construction of facilities, such as ceremonial structures, that would further enhance one’s prestige, thereby positioning them to both influence and benefit from important community decisions.

Eric Blinman’s analysis (1989) of McPhee Village in the Mesa Verde area illustrates this elaboration of status differences. This community consisted of twenty-one contemporaneous pueblo dwellings of varying sizes, as well as accompanying pitstructures, the largest of which contained features indicating use for communal rituals. Archaeologists recovered unusually high numbers of serving vessels and food remains – especially jackrabbit bones – suggesting that feasting activities occurred near the communal pitstructures (Potter 1997). But what was perhaps even more interesting was that the communal architecture was located near the larger households – so large, in fact, that they formed distinctive U-shapes as the rooms wrapped around the plaza areas containing the pitstructures. Not only did these households apparently control community ritual, they also exhibited the greatest quantities of imported trade goods, such as red-slipped pottery. Archaeologists further noted that access to some of the communal pitstructures was controlled by walls that closed off plazas (Hegmon *et al.* 2000:68–69), and the structures themselves were too small to accommodate many people (Schachner 2001). For most members

of McPhee Village, then, access to important ritual areas did not come easily, even though evidence of community-wide preparation indicates that the feasts themselves were “potluck” affairs (Potter 2000).

The shift to more tightly integrated matrilineal kin groups is the second change that impacted leadership in early pueblo villages. While we might expect that women became more empowered by this transition, the evidence suggests little gender difference in status prior to or immediately after the emergence of pueblo architecture (see contributions in Crown 2000b). The closer control over farmlands that this kinship form provided, however, necessarily introduced new inequities into pueblo village life, for those kin groups established in prime farming spots enjoyed advantages over others. Their better lands produced more food, they probably had ready access to good water sources, and they could more easily ride out a bad drought or other crisis. More recent immigrants, on the other hand, would be relegated to less productive lands, and they might therefore find themselves in debt more often, owing food, labor, and favors to the more established lineages in the village. In fact, the promise of such inequities may have encouraged the older kin groups – or at least the leaders who guided them – to accept immigrants desperate enough to take on lower-status roles.

These early pueblo villages were dynamic places. Occupied by a few dozen to a few hundred people, they were not simple farming hamlets. On one hand, village life was inextricably oriented to cultivating maize, squash, and other crops such as beans and, later, cotton. Ceremonies were organized to encourage rainfall, kin groups stayed together to preserve land, and people banded together in times of scarcity. On the other hand, the social and political life of the village was complex. People came and went from the village, drawing on extensive family relations spread over the landscape, often to escape from inequitable sociopolitical situations. Matrilineal kin groups broke apart, often over real or perceived injustices, while others banded together to promote the success of their charismatic priest. Periodic ritual events were especially exciting, with visitors coming from distant villages to trade exotic goods, arrange marriages, establish alliances, and engage in political intrigue. Life in these pueblo villages was not so unlike our lives today.

The end of the millennium: a new beginning

Driving north from Albuquerque along US Highway 550, the traveler first skirts the western edge of the Jemez Mountains, formed by explosive volcanic action ending about one million years ago. Near the small town of Cuba, the road veers to the northwest, leaving the mountains



3.9 The immense San Juan Basin, one of the least hospitable environments in the American Southwest, is surrounded on all four sides by higher elevations. In this photograph, Lobo Mesa is visible on the southern horizon, 50 km from Pueblo del Arroyo in Chaco Canyon.

behind as it crosses the San Juan Basin, one of the more desolate basins in the Southwest. This vast, high-altitude, semi-arid region is surrounded on all four sides by mountains (Figure 3.9): the Jemez Mountains to the east, the San Juan Mountains to the north, the Chuska Mountains to the west, and, to the south, the Dutton Plateau and the San Mateo and Zuni Mountains.

Turning west just outside of the tiny town of Nageezi, the traveler embarks on a bumpy journey across nearly 30 km of dusty road that can be impassable after a summer storm. On a clear day – and most are – you can see the mountains in all four directions as you race across the scrubby landscape, occasionally passing antelope and braking for the rabbits that dart across the road. Until 1996, the dirt road took you right to the steep edge of a shallow, broad drainage known as Chaco Canyon. These days, the road has been rerouted so that you hardly know you have entered the canyon. If it is spring or early summer, you might notice a narrow, muddy trickle of water as you drive along the deep wash in the center of the canyon, the first water of any type you have seen since crossing the Rio Grande near Albuquerque.



3.10 Pueblo Bonito, containing 500 rooms and standing at least four stories tall, provides a stunning contrast with the isolation and aridity of Chaco Canyon.

And then you see the buildings. Against the north side of Chaco Canyon, arrayed along the steep sandstone cliffs, massive Puebloan structures with hundreds of rooms still stand up to four stories tall – archaeologists call them “great houses.” Made of intricately shaped and placed masonry and roofed using beams from the mountains off on the horizon, the architecture is simply awesome (Figure 3.10). No one can visit Chaco Canyon and not wonder, “Why here?” And what you see still standing today is only a sample of what existed in the canyon 1,000 years ago, when hundreds of smaller pueblo homes and pithouses were clustered on the valley floor alongside the great houses, when roadways crisscrossed the landscape, and when intricate field systems captured the scanty amounts of available rainwater.

The first monumental architecture

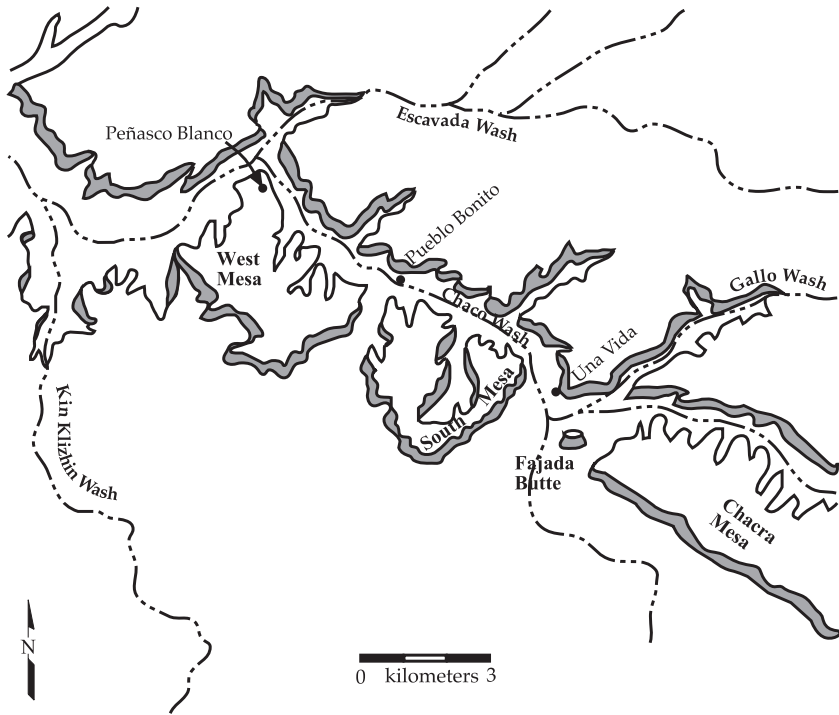
What you see in Chaco Canyon today is the culmination of centuries of human activity – it did not just all spring up overnight. To understand how it all happened, we have to go back to a time when the Puebloan Southwest was covered with small pithouse villages. Our story begins just before AD 700, when dozens of pithouse sites such as Shabik’eshchee

were arrayed along the floor of Chaco Canyon, occupied perhaps for a season, perhaps for longer, depending on the amount of rainfall and its impact on both wild and domesticated food resources. Farmers living in Shabik'eshchee were able to take advantage of the creek flowing nearby, but they also had to worry about the short growing season, for Chaco Canyon is at an elevation of about 2,000 m and can get quite cold.

People in Chaco Canyon, like everywhere else in the Southwest, had to contend with drought conditions that started in the AD 700s. Many parts of the canyon were abandoned, but people eventually did come back to farm as intensively as possible, storing their surpluses in jacal and masonry rooms. By AD 800, large clusters of pithouses and pueblo rooms sprang up in key locations on the canyon floor where side drainages channel runoff into the Chaco Wash (Windes 2001). Not a lot is known about these pueblo villages, for later developments largely obliterated them, leaving behind only a few structures and ceramics to indicate that they ever existed (Vivian 1990:153–8). One example was revealed during archaeological work around Fajada Gap, one of those areas in the canyon where multiple drainages converge. Archaeologists identified a loosely clustered community containing over fifty habitations and at least one large ceremonial pitstructure. The village was spatially divided into five smaller “neighborhoods,” some of which contained one or two dwellings larger than the others (Windes 1993:337–82).

Sometime in the middle of the AD 800s, people in at least three Chaco Canyon villages constructed a new kind of building. Where this happened first is unclear, although the best evidence from tree-ring dating suggests that the people living around what is now Pueblo Bonito started the trend by the AD 860s. Here, a structure with fewer than a dozen rooms was built using a masonry style known as core-veneer, in which a rubble core is faced with a veneer of shaped stones (Windes and Ford 1996). The early core-veneer style was fairly crude, especially compared to later forms, but the walls were thick, the rooms spacious, and the structure large compared to regular houses such as Site 724. Fronting the shallow arc of southeast-facing surface rooms at Pueblo Bonito were two large pitstructures, but little is known about them. The assumption is that they served ritual rather than domestic functions since a third pitstructure built a few decades later was devoid of any features, not unlike the ceremonial pitstructures found in other pueblo villages.

Pueblo Bonito was not the only such structure built in ninth-century Chaco Canyon (Lekson 1984). Approximately 5 km upstream, near another cluster of pueblo homes, residents built Una Vida, another early great house (Figure 3.11). And 5 km in the opposite direction, downstream from Pueblo Bonito, the first rooms of Peñasco Blanco were



3.11 The first great houses built in Chaco Canyon were established at locations where side canyons drain into the main wash.

constructed (Box 3.3). Una Vida appears to have started as six rooms and a pitstructure built in the early AD 860s, while construction of possibly thirty-three rooms in two rows occurred at Peñasco Blanco perhaps a few years later. Over the next several decades, all three structures were gradually expanded with new rows of rooms, new wings, and additional stories. By the early AD 900s, each great house included a few dozen rooms, dwarfing the typical habitations found in Chaco Canyon (Figure 3.12). At least one new great house was also built in the early AD 900s, the East Community great house, located well upstream from Pueblo Bonito (Windes 1993:459–63; Windes *et al.* 2000). This new structure was a harbinger of things to come in the tenth and eleventh centuries in the northern Southwest.

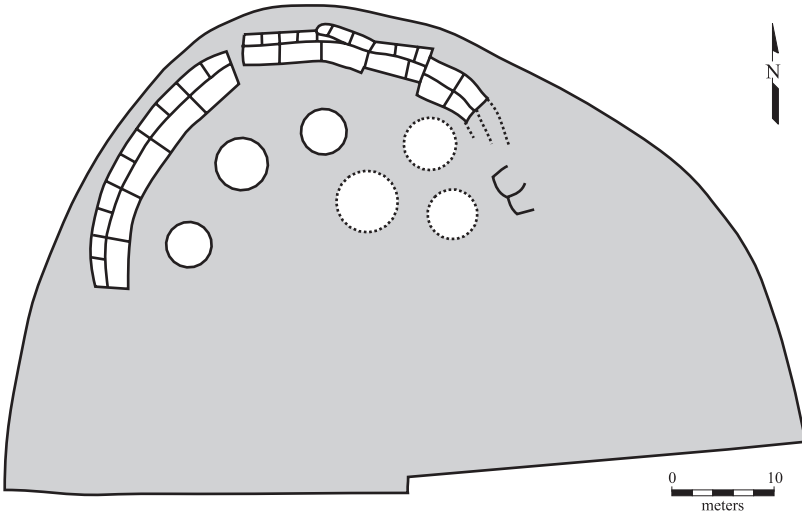
We will probably never know exactly what happened in the first rooms built at Pueblo Bonito, nor will we know exactly why it was constructed. Over 200 years of additions and modifications to Pueblo Bonito make it difficult to reconstruct its earliest uses. Further complicating our

Box 3.3 Lake-front property in Chaco Canyon?

In 2002, Eric Force and several colleagues published the results of an intensive study of the Chaco Wash that combined information on the sedimentary geology of the canyon with its archaeology. They determined that a large wind-blown dune at the mouth of Chaco Canyon – just below the Peñasco Blanco great house – impacted the flow of Chaco Wash. During periods when water flow was low, this dune formed a dam, backing water up the canyon and creating a shallow lake; in contrast, during wetter periods when more water flowed through the canyon, the dune was breached and soils deposited by the lake were eroded.

Force and his colleagues (2002) estimate that the lake was present for several centuries prior to the AD 900s, with its increasingly saline waters backing up the valley for at least one kilometer. The first three great houses in Chaco Canyon were built during this period, which probably explains why Peñasco Blanco was constructed on the rim above the canyon rather than on its floor – the lake covered the canyon below it. Not long before AD 900, the dune was breached owing to a combination of increasing rainfall and lake sedimentation. For residents of Chaco Canyon, this event was a problem, not because the salty lake waters were useful, but because the lake inhibited soil erosion. With the dam breached, the stream channel cut into the canyon floor, lowering the water table, eroding side canyons, and making it difficult to control water and soil for farming. Interestingly, this era saw very little great house construction.

After AD 1025, Chaco Canyon again experienced soil deposition and channels filled up again. The dune dam may have re-formed, but it also seems likely that Chaco's residents took matters into their own hands – a massive masonry dam apparently was built at this time. This corresponds with the establishment of a number of water-control features used for farming, and great house construction again increased. It was at this point in the Puebloan history of Chaco Canyon that it enjoyed its greatest influence. This new sedimentary history suggests that the development of surpluses and the resulting inequities in Chaco Canyon were not possible without the favorable farming conditions provided by the “Chaco Lake.”



3.12 Unlike the massive structure seen today, Pueblo Bonito only had a few dozen rooms by the early AD 900s. Part of the northern wing was constructed first, probably in the middle AD 800s, and the western wing was added not long after. The dates of kiva construction are less certain.

understanding of the great house is its lengthy history of investigation, including excavations that date to the dawn of American archaeology. Scholars still debate whether great houses were residential, used for storage, the focus of village ceremonial activity, or all of the above. Did the entire community pitch in to build them, or was their construction funded by ambitious leaders eager to promote their own interests? These topics will be taken up in the next chapter, when we consider the height of developments in Chaco Canyon. Two clues, however, serve as a teaser for that discussion. First, the appearance of great houses corresponds with a gradual improvement in climatic conditions. Second, by this time, people were intensely dependent on farmed foods. An analysis by Paul Minnis (1989) of preserved human fecal matter – known as “coprolites” – from tenth-century sites in the San Juan Basin found that an average of 85 percent of each sample was composed of maize. Very few wild foods were identified.

The first apartment buildings

Over 350 km south of Chaco Canyon, the Mimbres River drainage provides a stunning contrast to the San Juan Basin (Figure 3.13). Draining



3.13 The upper reaches of the Mimbres River Valley are relatively well watered, but as the drainage descends toward the south and the floodplain widens, the cottonwood trees and other riparian plants are replaced by flora better adapted to dry conditions.

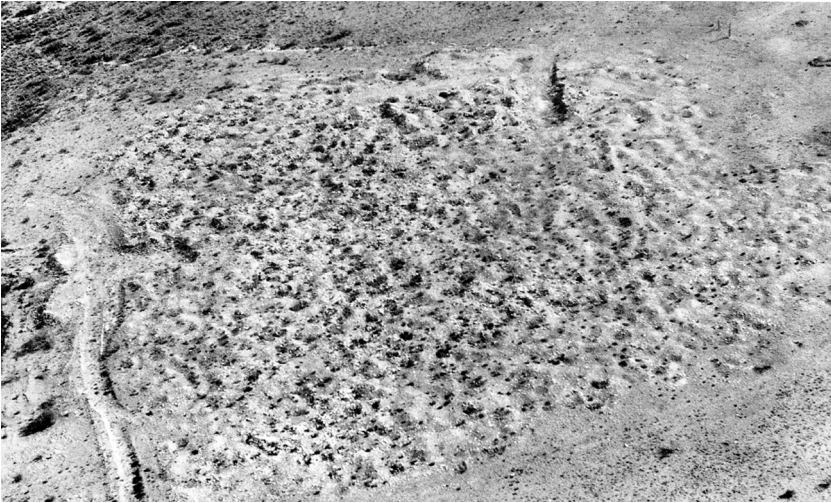
from the continental divide that bisects the rugged Mogollon Mountains, the Mimbres River and its branches meander southeast through green pine forests, passing rich alluvial plains but quickly descending into the arid Chihuahuan Desert. To the west, the Gila and San Francisco Rivers drop off the other side of the divide, draining their waters into what is now Arizona. As described in chapter 2, this is a land of contrasts, with wet and cool mountains only a short distance from hot and dry deserts. Farming was difficult in this setting, but compared to Chaco Canyon the perennial streams and ecological diversity created a rich environment with a variety of resources.

Mogollon people living in the Mimbres area were among the first in the Southwest to build pithouses, moving seasonally to take advantage of the easy access to different ecological zones (Diehl and LeBlanc 2001). They were also among the first to experiment with farming, adding maize and squash to their diet, perhaps as an emergency supply to back up more desirable wild resources (Minnis 1985; Wills 1988). Eventually, the Mogollon dedicated their subsistence efforts to farming, perhaps by AD 200 (Akins *et al.* 1999; Buzon and Grauer 2002; Wills 1995), although some scholars argue that the transition was not complete until much later (e.g., Gilman 1995). A study of groundstone tools, for example, found

that the size and shape of Mogollon *manos* and *metates* – used to grind hard seeds – changed after the AD 600s, becoming bigger and better designed to accommodate the larger kernels of Maiz de Ocho maize (Diehl 1996). Around the same time, people stopped building their pithouses on hills and ridges and moved down on to river terraces, near prime farmlands. During this transition, about a dozen large villages popped up along the Mimbres Valley, each oriented around large ceremonial pitstructures that were occasionally burned and rebuilt (Creel and Anyon 2003).

Demographic studies of the Mimbres area suggest a greater than four-fold increase in population from the AD 700s through 900s, with the pace of growth especially rapid in the tenth and eleventh centuries (Blake *et al.* 1986; Nelson 1999:37). This translates to a growth rate of 0.3 percent per year, which is high for a pre-modern society. Even conservative revisions of this rate suggest abnormally high population growth (Cordell *et al.* 1994:126–7; Nelson *et al.* 1994:119). Archaeologists debate the causes of such a rapid increase, and probably a number of factors were involved. The adoption of farming and sedentism is always a stimulus for growth, but another cause may have been immigration inspired by worsening climatic conditions in the AD 700s. As people fled lower-elevation areas in search of food and water, the upland river valleys were especially attractive – and remember that the Mogollon Highlands were a virtual oasis compared to the surrounding Chihuahuan Desert. Researchers have identified considerable variability in ceramic designs and mortuary practices during this era (e.g., Powell 1996), perhaps reflecting a concern with group identity as populations grew and as new immigrants introduced their own cultural practices. New residents also may explain the expansion of habitation into the less desirable secondary drainages during this era as well as the influx of some trade goods from distant sources, especially shell ornaments and perhaps pottery coming from Hohokam people to the west (Bradley 2000; Nelson 1999:33).

Surprisingly, above-ground architecture was a late phenomenon in the Mimbres region. Even during the period of rapid population growth, and even after groups on the Colorado Plateau began to build pueblo architecture, Mogollon people continued to live in pithouses, using underground cists to store surpluses. Why they resisted a move to surface rooms is something of a mystery. Perhaps they continued to rely on a flexible strategy that included considerable mobility, although their dedication to cultivated foods would suggest otherwise. Another possibility is that they were not as geared to overproduction and the storage of vast surpluses as were people to the north. This seems a more likely explanation, as the rivers draining the Mogollon Highlands were more dependable than the ephemeral washes and springs that supplied water to dry-farmers living



3.14 Mimbres architecture is not visually exciting, both because the walls of rounded cobbles collapsed long ago and because the sites have been heavily pothunted. This aerial photograph of Old Town reveals the hundreds of pothunter holes that have all but destroyed the site.

on the Colorado Plateau. The Mogollon placed their fields in floodplains where water tables were high and the rivers close enough to feed small irrigation canals, perhaps making it unnecessary to accumulate vast stores of surpluses to last through multiyear droughts. The diversity of arrowhead forms and animal remains also suggests that a wide range of game and other wild resources was available to Mogollon villagers (Nelson 1996).

The resistance to surface architecture faded during the AD 900s, corresponding with a peak in cultural diversity – perhaps representing a surge in immigration and population aggregation. Similar to what happened in the AD 700s on the Colorado Plateau, the Mogollon first built pueblo rooms to store small food surpluses, but soon residential rooms were also constructed. Overhunting and excessive foraging in areas surrounding the villages may have also inspired greater investment in farming and the production of surpluses (Cannon 2000; Spielmann and Angstadt-Leto 1996). The new architecture was constructed of river cobbles held together with copious amounts of mud (Figure 3.14), making the walls less stable – and perhaps less aesthetically pleasing – compared with the nicely shaped sandstone masonry used in most areas of the Colorado Plateau. Also, unlike the clusters of “Prudden units” seen

to the north, buildings in the Mimbres region continually grew; as kin groups expanded through birth and marriage, they simply kept adding on more rooms rather than constructing separate residences. By AD 1000, these structures were getting quite large, rivaling the scale of the ceremonial great houses in the San Juan Basin. And people living in the Mimbres area started making the beautiful pottery that would make them famous.