

# Cultural Landscapes of Prehistory in Southern Arizona

DRAFT

Sonoran Desert Conservation Plan

May 2000



Illustration by Michael A. Hampshire, 1998



Pima County, Arizona  
Board of Supervisors

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County Administrator  
Chuck Huckelberry





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# MEMORANDUM

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Date: July 3, 2000

To: The Honorable Chair and Members  
Pima County Board of Supervisors

From: C.H. Huckelberry  
County Administrator

A handwritten signature in dark ink, appearing to be "CHH", is written over the printed name "C.H. Huckelberry".

Re: **Cultural Landscapes of Prehistory in Southern Arizona**

## **Background**

During the past months a number of reports have been produced to contribute to the Cultural and Historic Resources Element of the Sonoran Desert Conservation Plan, including:

- *History of Archaeological, Historical, and Ethnographic Research*
- *The People of Southern Arizona, Past and Present*
- *Relationships Between Land and People*
- *Cultural Resource Sites as Depicted on Early Maps in Pima County*
- *Overview of Traditional Cultural Places in Pima County*
- *Cultural Landscapes of History in Southern Arizona*

At the same time these broadly descriptive reports have been drafted by Statistical Research Incorporated (SRI), members of County staff working with the Cultural and Historic Resources Advisory Team have analyzed resources at the watershed subarea level, and presented this information in the form of nine reports to the Steering Committee for the Sonoran Desert Conservation Plan. Later this summer, a document that brings together all of the cultural resources research developed for the Sonoran Desert Conservation Plan will be issued to define this element in a more comprehensive manner.

## **Ancient Cultural Landscapes -- The Preclassic Hohokam**

The attached document entitled *Cultural Landscapes of Prehistory in Southern Arizona* completes the series of reports by Statistical Research Incorporated. A discussion of the period of Hohokam culture between 800 and 1200 A.D. is divided into four sections that review the domestic landscape, the agricultural landscape, the religious landscape, and the social landscape of the people who have a name that translates to "finished ones" in Piman.



**Dwelling Space: The Built Environment of Home**

Pages 2 through 6 of the attached report describe findings and theories about Hohokam dwellings. A few highlights are reproduced below:

- "The typical Hohokam pit house was a mud-covered structure of poles, brush, and thatch, built within a shallow pit -- hence the name." [Page 3; Figure 1]
- "The placement of the hearth -- the heart of the home -- was invariably in front of the entry. The typical Hohokam hearth was a shallow, circular basin that was well plastered. It was set into the house floor with its rim level with the floor surface. There was little standardization in other aspects of floor features. The floor, the floor of the entry, and the sides of the pit walls were plastered." [Page 3]
- "Field houses -- temporary structures built near the agricultural fields, in which people lived during the farming season -- were usually built less substantially than more permanent habitations." [Page 3]
- "Ramadas, or open-sided pole and brush shelters, were probably used for a variety of domestic activities." [Page 3]
- "The arrangement of houses on the land surface was not random or unplanned, but apparently highly structured. The basic unit of organization was a group of houses that archaeologists label a 'courtyard group.'" [Page 4]
- "Houses were arranged around an open central area with their entries facing into this courtyard or yard. Communal features such as large roasting pits or ovens, trash mounds, and cemeteries may be associated with courtyard groups. Estimates of 16-20 residents have been made for each." [Page 4]
- "Most important, the location of the courtyard remained stable through time." [Page 4]
- "Larger groupings of houses within villages have been termed precincts or village segments." [Page 4]
- "The villages were composed of repeated clusters of village segments that were spatially separated from other units. An open, central plaza area may be the village focus at the largest settlements." [Page 4]
- "The smaller courtyard groups were no doubt based on immediate kinship; the larger groupings (village segments or precincts) indicate the presence of a larger, corporate descent group such as a lineage or clan." [Page 4]



### **The Agricultural Landscape**

Pages 6 through 14 describe agricultural and resource gathering activities for the Hohokam residents of Southern Arizona from 800 to 1200 A.D. Highlights include:

- "Few other prehistoric peoples of the Southwest were as skilled as the Hohokam in building water-control features, and the diversity of their water-control techniques and farming practices was remarkable." [Pages 6-7]
- "Their water-control technology included runoff or floodwater farming by capturing rainfall and diverting it to their fields; irrigation farming by means of canal systems taking water from the rivers; and dry farming, using only natural precipitation." [Page 7]
- "Hohokam canal systems exceeded in scale all other prehistoric systems in North America. For example, Canal System 2, located on the north side of the Salt River, ... consisted of 50 main canals constructed over a period of about 900 years. Canal systems consisted of main and secondary canals and networks of feeder ditches. Headgates controlled the flow of water." [Page 7]
- "Simple ditches and weirs were also used to divert water from cienegas, springs, and artificially impounded reservoirs. The Tohono O'odham practiced a technique called ak-chin farming. Ak-chin is a Piman word for the alluvial fan at the mouth of an arroyo. Agricultural fields were located on these aprons of fertile soil and were watered by rainfall runoff, sometimes directed by brush or stone dams and simple ditches. The Hohokam probably used similar methods."
- "Conservation techniques for dry farming included rock-pile fields and terraces. Many portions of the bajada slopes of the Tucson Basin and adjacent areas were too distant from water ... and were dry farmed. Hundreds of acres in these areas were devoted to cultivation through building simple rock piles that trapped and conserved direct moisture and also protected the growing plants. Huge rock-pile fields occur throughout the Tucson Basin, in the Marana area on the bajada of the Tortolita Mountains, in the southern Tucson Basin, and in the Picacho Mountains area." [Page 8]
- "Crops that were grown include domesticated plants (corn, beans, squash of several varieties, tobacco, and cotton)."
- "The Hohokam relied less intensively on hunting than other prehistoric peoples of the Southwest. Nonetheless, large animals, such as deer, pronghorn, and bighorn sheep, and small animals, particularly rabbits and other rodents, were regularly hunted. Fish, birds, reptiles, amphibian, and even insects were consumed." [Page 11]



### **The Social and Political Landscapes**

Pages 21 through 37 of the attached report describe the social and political dynamics of the Hohokam as they can be inferred from hints left on the landscape. A few highlights are:

- "Archaeologists have not very clear understanding of where and when Hohokam culture originated. There are two general hypotheses: the Hohokam culture grew up locally from Late Archaic peoples who were living in southern Arizona, and that the Hohokam were immigrant people who originated from somewhere in what is today Mexico. The weight of the evidence today supports the second hypothesis." [Page 22]
- "Whereas conflict among social groups may be inevitable, there is little or no evidence of warfare ... among the pre-Classic period Hohokam." [Page 28]
- Researchers have asserted that "while violent conflict cannot be dismissed for the Hohokam, it existed at a minimal level compared with other Southwestern societies and was not elevated to a dominant preoccupation... . They also suggested that, as sedentary village farmers, the Hohokam would have had a greater stake in minimizing conflict than more mobile southwestern peoples." [Page 28]
- "The northern Tucson Basin offers good examples of community relationships and the landscape whole. Research has defined two ... communities of equivalent scale in this area. One was on the flank of the Tortolita Mountains and the second along the Santa Cruz River at the northern end of the Tucson Mountains. Both incorporated permanent sources of water, diverse locations for productive activities, a range of site types reflecting these activities, and focal sites with ball courts. Each community was surrounded by areas lacking substantial habitation sites and with sparse distributions of other types of sites." [Page 32]
- "The Hohokam evidently emphasized the family and larger descent groups, such as lineages and clans. This is mirrored in their dwellings, the organizations of their villages, and in their ritual performances." [Page 35]
- "Social organization seems to have been nonhierarchical, or at least horizontally arranged. That is, instead of hierarchical ordering of levels or tiers, there was a repetitive patterning of equivalent units. This is seen in house clusters, the organization of villages, in community patterning, and in the regional landscape as a whole. House clusters were accretions of similar houses, villages were accretions of house clusters, communities were similar-sized and equally spaced settlements, and the regional landscape was patterned with dispersed, equivalent communities." [Page 35]



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### **Conclusion**

The report on *Cultural Landscapes of Prehistory in Southern Arizona* conveys a sense of the Hohokam's attempts to make the best of resources found on the Southern Arizona landscape. County staff members have added a number of figures to the report that will be recognizable as the lasting symbols and art forms that have characterized our area. Uncertainties about the origins and fate of the Hohokam people, coupled with the other aspects of their cultural story, will keep the current residents of Southern Arizona interested in this past people. The protection of cultural resources under the Sonoran Desert Conservation Plan will allow us to continue to gain information and add to our own wisdom about how people in Southern Arizona have failed and succeeded in attempts to balance and integrate land use and natural resource utilization.





Regional Synthesis of Cultural and Historical Resources

Pima County Sonoran Desert Conservation Plan

**Ancient Cultural Landscapes of Southern Arizona:**

**The Preclassic Hohokam**

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Submitted by

Statistical Research, Inc.

P.O. Box 31865

Tucson, AZ 85751

June 2000

## Ancient Cultural Landscapes of Southern Arizona: The Preclassic Hohokam

Stephanie M. Whittlesey

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The past is a foreign county. They do things differently there.

—L. P. Hartley  
*The Go-Between*

This report considers details of the landscapes and lives of the Hohokam inhabitants of the Tucson Basin. To focus attention, the discussion is restricted to the period between the first appearance of a recognizable Hohokam culture in the Pioneer period, around A.D. 800, and the end of the Rincon phase around A.D. 1150 or 1200, when Hohokam culture was reorganized in rather radical ways—the time known as the pre-Classic period. In addition to the valley of the Santa Cruz River itself, the adjacent mountain slopes such as the Santa Rita and Tucson Mountains and nearby valleys like Avra Valley are included in the discussion. Different segments of the prehistoric landscape are discussed, including dwelling space, the agricultural landscape, resource procurement, the sacred landscape, social and political landscapes, and settlement patterns or relationships within the landscape. The report concludes with synthesis of these aspects into a unified discussion of the ancient Hohokam landscape. The concepts used in this discussion have been presented in another section of the cultural resources overview prepared for the Sonoran Desert Conservation Plan (SDCP): (*Relationships between Land and People: The Cultural Landscapes Approach in Archaeology and History*).

The overarching philosophy and theoretical background underlying and supporting this notion is one of mutualism between peoples of the past and their environment. This is the central tenet of the cultural landscapes approach. People do not passively “adapt” to their physical and biological environments, but are active participants in shaping as well as using these environments. It is most useful to think of the history of past *interactions* between people and the constituents of their environments—the land, climate, plants, animals, mineral resources, and other people. These interactions often leave indelible traces and consequences, which in turn affect people’s ability to live with the land. The record of these interactions is written in archaeological sites, landmarks, and material culture. Last, the importance of cognition, belief, and values in shaping these interactions must be recognized. Archaeologists cannot attempt to understand the minds of ancient peoples, creating a kind of “paleopsychology,” but they can recognize the importance of ideology in society (Renfrew 1994b). The intangibles of belief and cognition are admittedly more difficult to decipher than the prosaic use of resources, economy, and farming technology, but traditional methods of scientific archaeological inquiry can be applied to investigate symbols, cognitive processes, and related concepts (Renfrew 1994b).

“The past is everywhere,” Lowenthal (1985:xv) has written. “All around us lie features which, like ourselves and our thoughts, have more or less recognizable antecedents. Relics, histories, memories suffuse human experience. Each particular trace of the past ultimately perishes, but

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collectively they are immortal. Whether it is celebrated or rejected, attended to or ignored, the past is omnipresent." This report seeks to celebrate one foreign country of the past—the one in which the ancient Hohokam of the Tucson Basin lived, worked, played, and dreamed.

### Dwelling Space: The Built Environment of Home

The house is our most basic modification of the environment, the mediator between ourselves and the outside world—what Jackson (1994:37) has called a "counterenvironment." The house provides shelter from the elements, warmth, protection from predatory animals, and a sense of security. It may embody much more than these basic needs, however. The house typically is a private space—the place where domestic family matters are carried out, the place of origin and often the place of death. "The dwelling accommodates the actual and the ritual, the known and the unknown, the factual and the spiritual. Since once is born in it, grows with it and weds and dies in it, the dwelling shelters all stages of life" (Tjahjono 1989:224). It may differ from the outside world of the larger community where space is shared, and may not be the location of everyday work—crafts, farming, and so on (Jackson 1994:56). Different social spheres and different rules of operation may therefore characterize the private house and the larger community. As Jackson (1994:57) wrote of the Hispanic-American community in northern New Mexico, the role of the house "was to make visible how the inside world related to the outside, how the individual related to the village, and how the hours of working with others were distinct from the private routine of the home."

Moreover, the house is a rich well of symbolism, cultural beliefs, and ideology. To the Navajo, for example, their house or *hoogan* (hogan) is a structure that embodies the social, philosophical, and religious teachings of the Diné, as the Navajo call themselves. The cultural significance of the hogan lies in its power to locate individuals within the universe and in relation to sacred mountains, sheep-herding areas, and watering holes. The orientation and architectural features of the hogan symbolize pivotal relationships that structure Navajo philosophy and ideology, such as male versus female and Mother Earth versus Father Sky (Lane 1999).

Last, houses are typically an expression of a cultural tradition, of the beliefs and worldview that help cultures persist in times of change. As Bourdier and Alsayyad (1989:5) have written, "Traditional dwellings and settlements are the built expression of a heritage that continues to be transmitted from one generation to another." Or as Nazarea (1999:11) has expressed it of the Navajo, the hogan is "in a very concrete sense, a locating device for the Navajo sense of self and a vital thread in the persistence of cultural memory."

For all of these reasons, therefore, one must begin with Hohokam houses to understand the Hohokam world. Dwellings are the landscape modifications representing what Zedeño (1997) has called *living space*. The formal dimension of the dwelling landscape—the built environment or landscape modifications—are usually houses of one form or another and related buildings.



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Although this was certainly true in ancient times, today Hohokam houses are difficult or impossible to see. They were constructed of perishable, organic materials that decayed over time. Centuries of wind and water and processes of erosion and alluviation covered the remnants of Hohokam dwellings, often with a meter or more of deposits, so that less visible traces remain on the surface today.

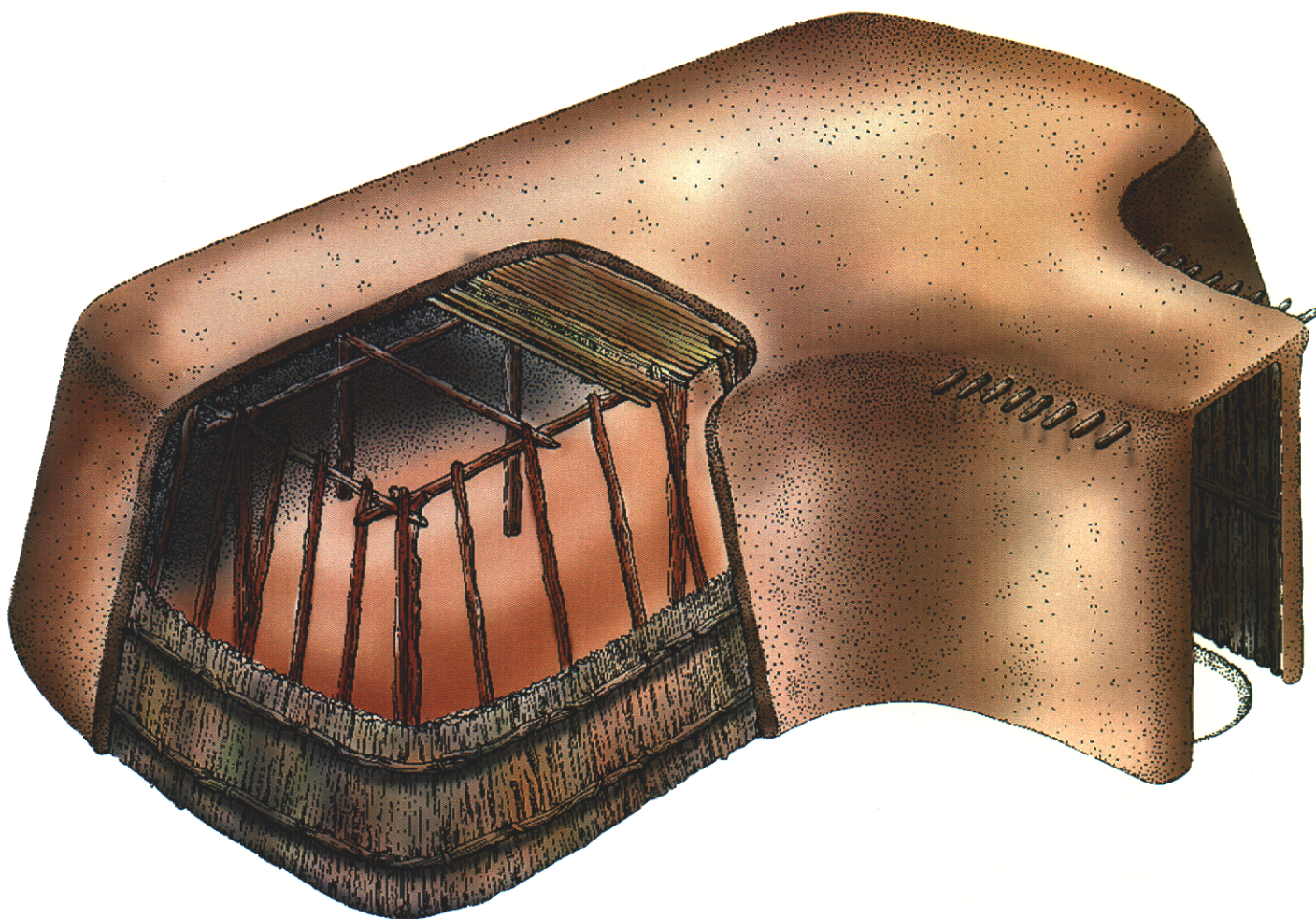
In describing Hohokam houses and their arrangement it is necessary to deal in generalities, for there was considerable variation in construction and organization, and this changed through time and from place to place. The typical Hohokam pit house was a mud-covered structure of poles, brush, and thatch, built within a shallow pit—hence the name (Figure 1). As Haury (1976:72) wrote, “the Hohokam architectural idiom was a unit structure built in a pit.” The construction is more accurately described as a “house in a pit,” for the walls of the structure were set inside the vertical or sloping walls of the pit. A shallow groove may be visible where the posts were set into the floor next to the pit wall. An entry way, which may have been ramped (sloping) or horizontal with a step down inside the house (stepped), was built much the same as the main structure. The most typical house shape was rectangular with slightly rounded corners, although there were many variations. Roof construction also varied. Two, four, or more central posts may have been used to support the roof (Czaplicki and Ravesloot 1988, 1989b; Doelle 1985; Elson 1986; Ferg et al. 1984; Huntington 1986; Kelly et al. 1978; Whittlesey 1999) (Figures 2 and 3).

The placement of the hearth—the heart of the home—was invariably in front of the entry. The typical Hohokam hearth was a shallow, circular basin that was well plastered. It was set into the house floor with its rim level with the floor surface. There was little standardization in other aspects of floor features. The floor, the floor of the entry, and the sides of the pit walls were plastered. Sometimes only the floor area around the hearth in front of the entryway was plastered, forming an apron around the hearth.

Field houses—temporary structures built near the agricultural fields, in which people lived during the farming season—were usually built less substantially than more permanent habitations. They were typically shallow structures without deep house pits, and lacked entries (Ciolek-Torrello 1988; Ferg et al. 1984; Huckell et al. 1987). Field houses were also used as temporary encampments for intensive collecting and processing of wild resources, as discussed below.

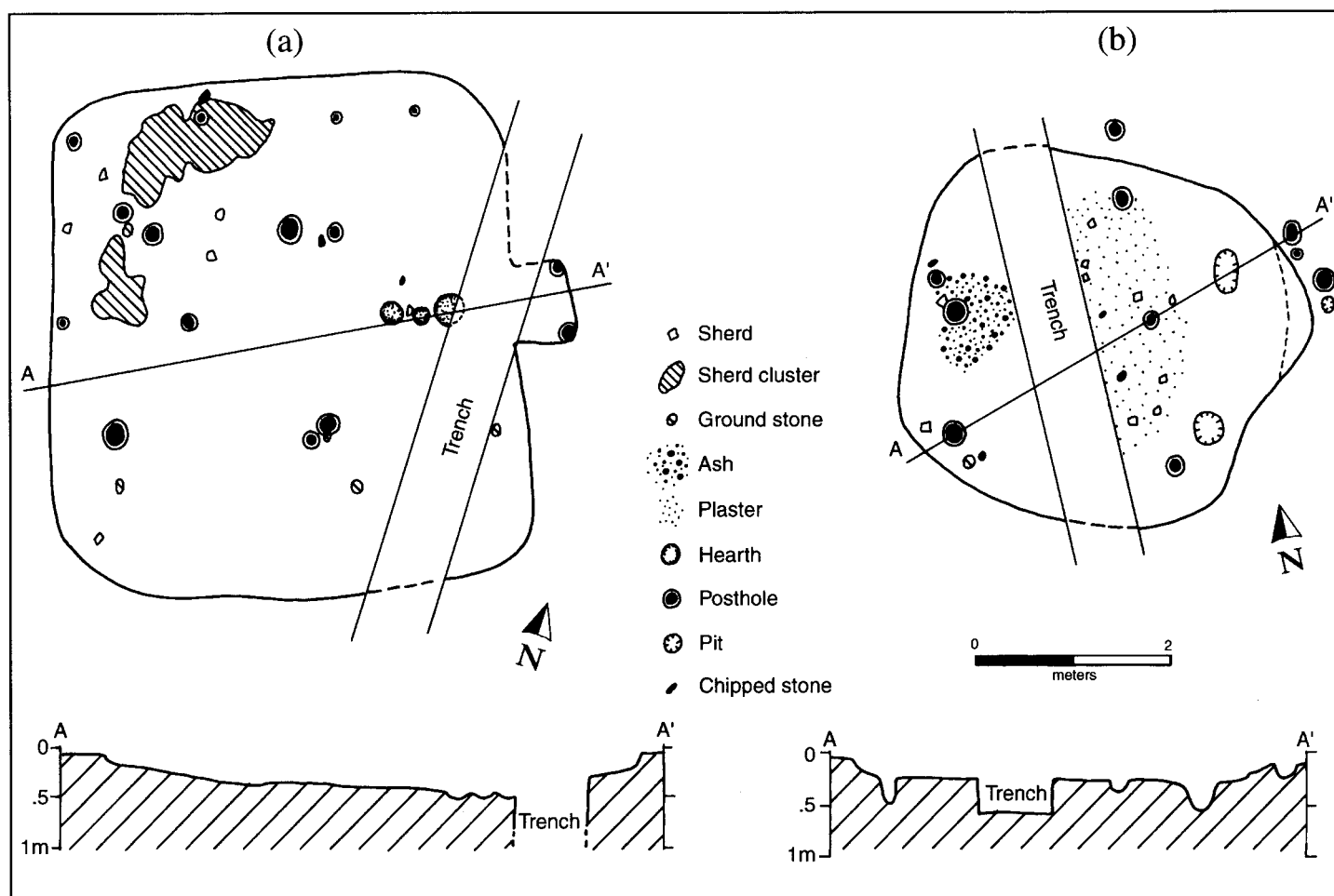
*Ramadas*, or open-sided pole and brush shelters, were probably used for a variety of domestic activities (Bernard-Shaw 1989). We know less about these constructions because archaeologists have typically focused their excavations on houses, whereas *ramadas* and other outdoor facilities were built in courtyard areas or other extramural spaces.

Although most houses were multifunctional and used for several purposes, there was some functional variability in houses, not all of which were used for habitation. Some structures lacking hearths, and often built less substantially and smaller than habitation structures, are



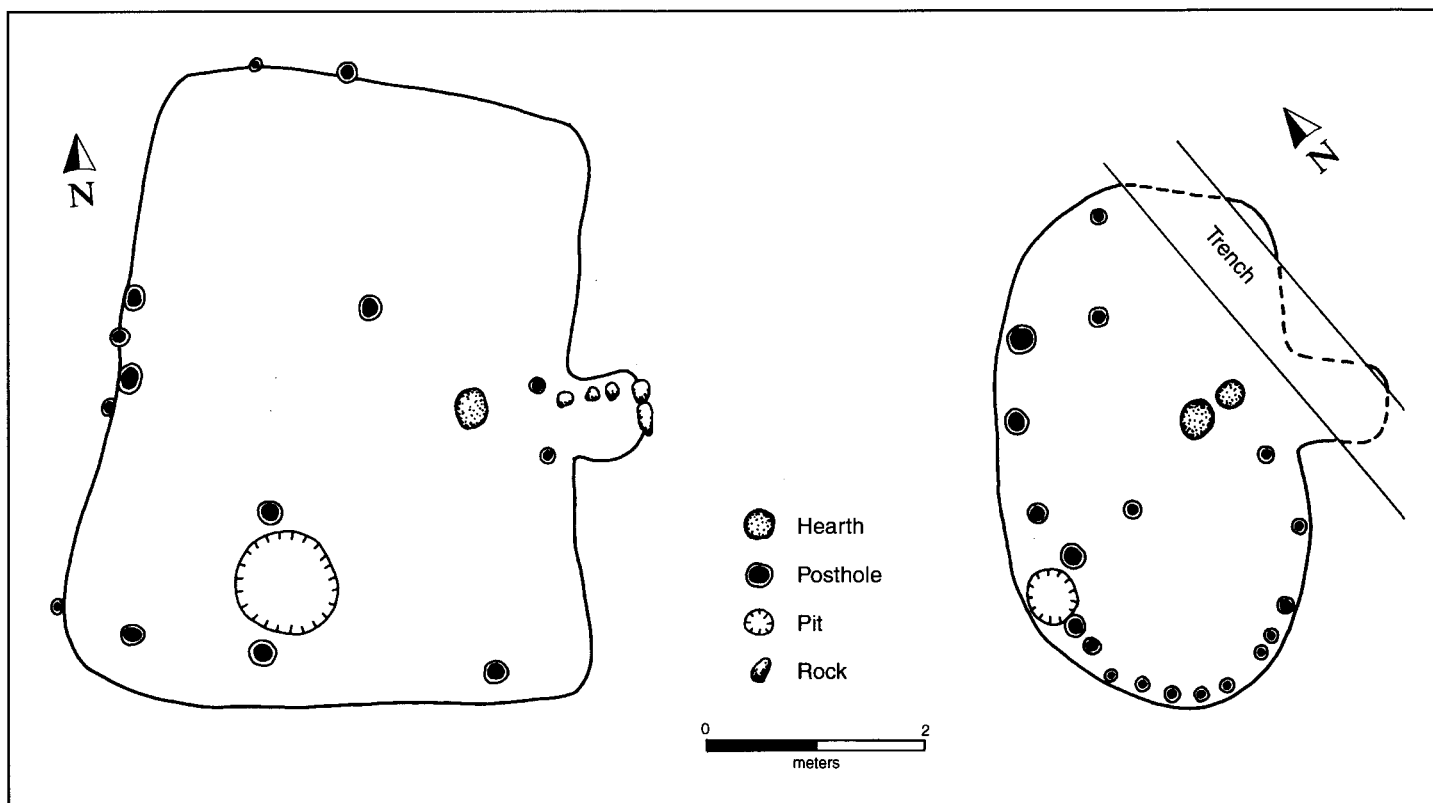
**Figure 1**

*Artist's reconstruction of a Hohokam pit house.*



**Figure 2**

*Plan and profile of Rillito phase Hohokam house structures at the Fastimes site, as excavated and mapped by archaeologists: (a) formal house structure; (b) informal house structure.*



**Figure 3**  
*Rincon phase Hohokam house structures at the West Branch site, as excavated and mapped by archaeologists.*



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inferred to have been storage structures (Ciolek-Torrello 1988; Layhe 1986; Vokes 1988, 1989). Some had pot rests and storage pits.

The arrangement of houses on the land surface—the relational dimension of the dwelling landscape—was not random or unplanned, but apparently highly structured. The basic unit of organization was a group of houses that archaeologists label a “courtyard group” (Ciolek-Torrello 1988; Doyel 1987; Howard 1982, 1985; Wilcox et al. 1981). Houses were arranged around an open central area with their entries facing into this courtyard or yard. Communal features such as large roasting pits or ovens, trash mounds, and cemeteries may be associated with courtyard groups. Estimates of 16–20 residents have been made for each courtyard group (Gregory 1983:158; Wilcox et al. 1981:180). Most important, the location of the courtyard remained stable through time. New houses might be built and older houses abandoned as the composition of the domestic groups living in them changed, but the house cluster and its spatial setting retained its integrity (Doyel 1991; Howard 1982, 1985; Wilcox et al. 1981).

Larger groupings of houses within villages have been termed precincts or village segments (Howard 1982). The villages were composed of repeated clusters of village segments that were spatially separated from other units. An open, central plaza area may be the village focus at the largest settlements (Doyel 1991:249). The best data about village-scale organization comes from the site of Snaketown. Sufficiently large areas to determine this kind of spatial patterning have been excavated at only a few village sites in the Tucson Basin, such as at Water World (Czaplicki and Ravesloot 1989b). We do not know, therefore, how typical the patterns at the excavated sites may be. At Snaketown, there was a concentric organization of habitation and ritual structures. There was an inner zone of habitations surrounding a central plaza and ringed by trash mounds and ceremonial mounds. The outer habitation zone also contained public ritual features, such as ball courts (Doyel 1991:Figure 6.7).

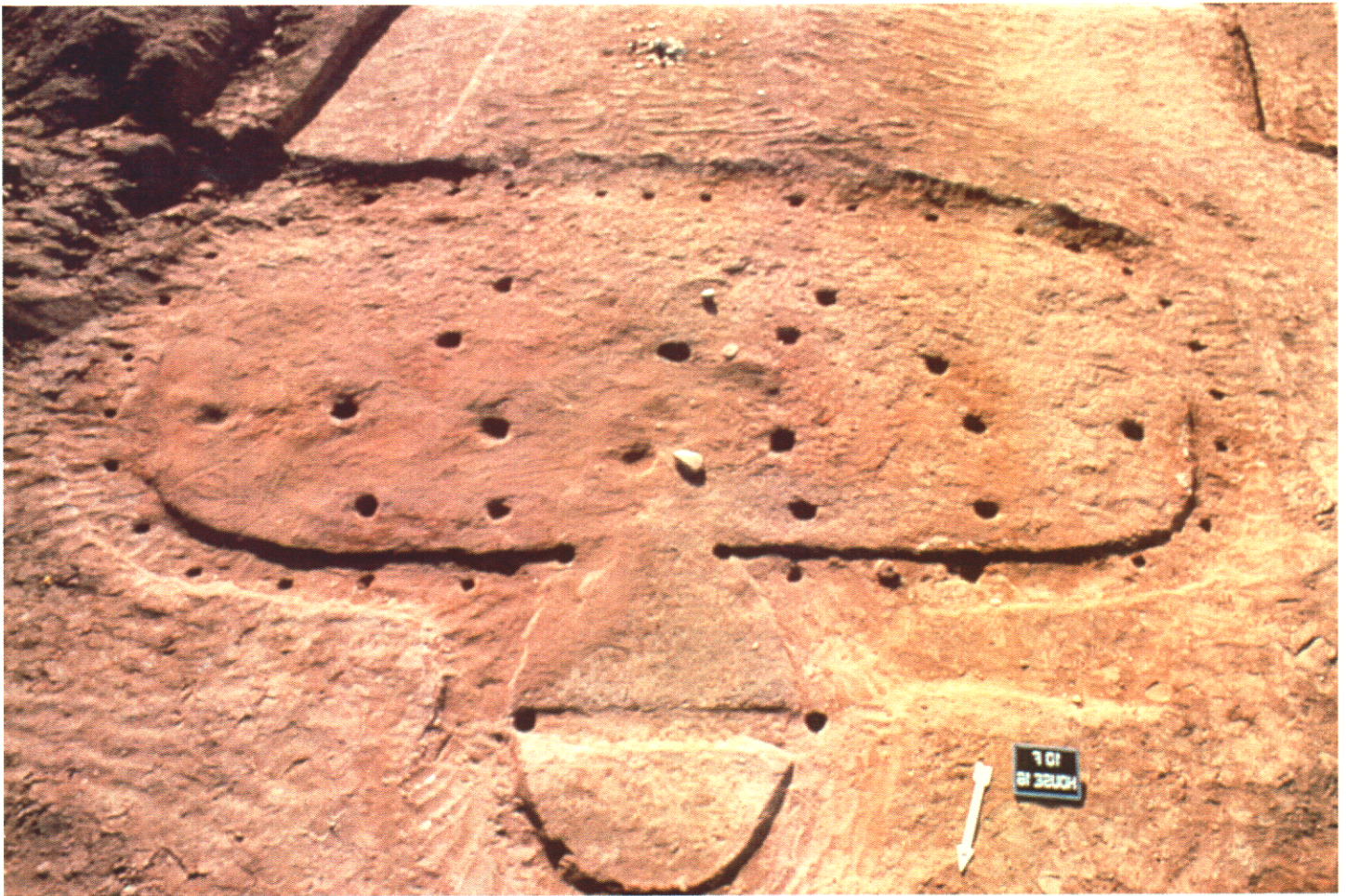
As Bourdier and Alsayyad (1989:17) have written, “The way one constructs meaning and understands semantically how a house is conceived, like the way one builds a house, is often indicative of either an ideology or a world view.” What does the Hohokam domestic landscape—the portions of the built environment used for habitation and the arrangements and organization of its component parts—tell us about social organization, ideology, and worldview?

The spatial relations of houses can be analyzed to extract patterns that may inform on social organization and ideology. First, the importance of land to the Hohokam is readily apparent. The courtyard group likely represents the residence of a land-based social group, probably an extended family or slightly larger group. The persistence of courtyard groups over generations indicates the stability and strength of this land-based unit (Whittlesey 1998b:707). Possible “ownership” of land by these groups is indicated. Second, kinship was evidently a prime factor in Hohokam society. The smaller courtyard groups were no doubt based on immediate kinship; the larger groupings (village segments or precincts) indicate the presence of a larger, corporate descent group such as a lineage or clan.

The house may be viewed as a sort of miniature cosmos, a totality of natural environment, community, and family (Bourdier and Alsayyad 1989; Feldman 1989; Tjahjono 1989). The inward focus of Hohokam houses and the lack of a prescribed orientation direction support the importance of the kinship group in Hohokam life. This contrasts with dwellings in other cultures, where the orientation may reflect the importance of cosmology on a universal or astronomical scale. For the Navajo, for example, the single hogan and its orientation indicate the importance of the outer world—the larger landscape and the universe as a whole. The east signifies all that is good in the universe, and the entrance of the hogan therefore always faces in this direction (Lane 1999:39). “Navajo families desire that the first light enter through the entrance because human beings, by natural law, are supposed to function in light” (Lane 1999:39). By contrast, Hohokam houses faced each other; the first thing that the Hohokam resident would see upon awakening would be, not the early rays of the rising sun or other cosmological or astronomical features, but the nearby house of a relative. Moreover, as Whittlesey (1998b:707) has written, “The close links with parcels of land evidenced by stable courtyard groups and their associated formal cemeteries are suggestive of ancestor veneration.” This is reinforced by other aspects of Hohokam life, such as the figurine complex that will be discussed below. The Hohokam connection to the ancestors may have been through a relationship to the land as well as to people, however, as indicated by the persistence of land-based social units through many generations. That is, the Hohokam may have thought of themselves as people of a certain place as well as people of a certain kinship or descent group.

The standardized placement of hearths implies the importance of fire as a source of light and heat. In many cultures, hearths are associated with the women of the family, and each wife in a multiple-wife household has her own dwelling and her own hearth. A new hearth may therefore signify a new marriage in some cultures (Khambatta 1989:263). Fire may have been considered sacred to the Hohokam as it was to the Navajo (Lane 1999:38) because it provided warmth for human comfort and the food that nourishes human bodies. There was evidently some close association between the hearth of the house and the portal to the house, as indicated by the standardized placement of hearths relative to the entryway, but whether this was for practical reasons (to keep the house free of smoke) or ideological reasons is unknown. The importance of fire to the Hohokam worldview is seen in many aspects of their rituals and symbolism, as will be discussed below in the section on the Hohokam sacred landscape.

The built environment of the Hohokam domestic landscape did not reveal obvious distinctions in wealth or power. All houses were built in much the same way, with the same materials, and differences in size of houses and numbers of houses in a group are probably reflective of the size of households rather than any other factors (Ciolek-Torrello 1988; McGuire 1992:204; Whittlesey 1998b:707). The Hohokam village resembles what Wilk (1983) has described as a “closed village economy,” in which inequality finds expression through portable objects rather in architecture. Attempts to delineate differences in household wealth and authority by looking at architecture, type and arrangement of floor features, and artifact assemblages on house floors have generally failed, therefore (e.g., Huntington 1986; Rice 1987b). This may



*Photo courtesy of Arizona State Museum*

*Example of an excavated Hohokam pit house, which reveals its architectural form and details of its construction.*



reflect the relative absence of social inequality in Hohokam life, or it may simply mean that inequality was expressed in different ways.

In traditional cultures the world over, religious ceremonies are commonly associated with the construction and use of domestic space (Bourdier and Alsayyad 1989:19). There may be feasts, rituals, sacrifices, and offerings at specific stages in house construction or when construction is complete (Feldman 1989; Pavlides and Hesser 1989; Tjahjono 1989:225–226). Ritual acts, such as burning incense, may celebrate and perpetuate the ideological symbolism of the dwelling or balance the forces represented in the space. Houses may become the setting for many religious rituals, at all times of the year or on special occasions (Pavlides and Hesser 1989:283). The house may hold shrines or altars. These aspects of Hohokam dwellings and their construction and use remain unknown to us. Haury (1976:266) has suggested that figurines may have been ritual offerings, perhaps used in house blessing.

In summary, the domestic landscape indicates that the Hohokam had close ties to the land and to their own kinship groups, whether living or dead. The family was the primary bulwark against the vicissitudes of daily life. The land was the source of sustenance itself. Land and kinship blended together seamlessly in the Hohokam built environment of courtyard groups and villages. Family and larger kinship groups used the land, but no doubt also served as its custodians and protectors as well.

### **The Agricultural Landscape**

Farming practices are essential to understanding prehistoric subsistence, and agricultural features are one of the most important parts of the ancient landscape. Among agricultural peoples such as the Hohokam, farming technology was crucial to sustainable resource use and to maintaining the delicate balance between environment and productivity. Sustainability refers to “how people in a particular locale manage resources both in order to maintain themselves on a daily basis and to insure they have what they need as they move from one annual cycle to the next and from one generation to another” (Collins 1991:33). For the Hohokam, sustainable agricultural development was focused on water and its control.

Hohokam agricultural technology was an important means of articulating with the environment (the relational dimension of ancient landscapes). In farming technology we see the complicated and mutual interactions between people and the land. The formal dimension of the agricultural landscape—what Zedeño (1997) calls *food procurement space*—is represented in the various landscape modifications that the Hohokam constructed to enable them to grow crops, divert water to their fields, and control soil erosion. These modifications are one of the most obvious features of the built environment.

Few other prehistoric peoples of the Southwest were as skilled as the Hohokam in building water-control features, and the diversity of their water-control techniques and farming



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practices was remarkable. Their water-control technology included runoff or floodwater farming by capturing rainfall and diverting it to their fields; irrigation farming by means of canal systems taking water from the rivers; and dry farming, using only natural precipitation (Fish 1995). They were also skilled in conserving water by various means—constructing features to capture and hold moisture from precipitation, storing water by means of reservoirs, and digging wells to tap the water table where possible (Haury 1976). To maintain stable productivity in their fields, the Hohokam were also concerned with soil erosion and fertility. The importance of water and farming to the Hohokam is seen in the pervasive water symbolism in their artwork, which presumably also focused their cosmology and religious beliefs of which we know comparatively little.

The Hohokam of the Phoenix area were far more dependent on irrigation farming than those living in the Tucson area. The canal systems along the then-perennial Salt and Gila Rivers were many miles in total length and irrigated thousands of acres of land. These systems persisted over generations, not unlike Hohokam villages themselves. This suggests the same kind of link to the land that is seen in Hohokam domestic architecture and courtyard groups. Hohokam canal systems exceeded in scale all other prehistoric systems in North America (Doolittle 1990:79). For example, Canal System 2, located on the north side of the Salt River, which was described and mapped by Omar Turney in the 1920s, consisted of 50 main canals constructed over a period of about 900 years (Reid and Whittlesey 1997:76). Canal systems consisted of main and secondary canals and networks of feeder ditches. Headgates controlled the flow of water.

Irrigation in the Tucson Basin was much more limited by the character of the Santa Cruz River, which flowed above ground only along certain stretches. In the area between Punta de Agua near Mission San Xavier del Bac and Point of the Mountain at the northern end of the Tucson Mountains, it was possible to divert the river's flow onto fields by means of canals, and a few canals have been found in this area (Mabry et al. 1997; Fish et al. 1985:69). A series of canals in this area is described by Mabry (1997). Excavations found four, approximately parallel canal alignments deeply buried in the alluvium deposited by the Santa Cruz River. The canals ranged from V-shaped to flat-bottomed in cross section, although most typically they were U-shaped. Width ranged from about a meter to almost two meters, and depth from about one-third to three-fourths of a meter (Mabry 1997:420). The sediments in the canals were mixtures of water-lain sediments and cultural trash and charcoal. The canals apparently were constructed during the Rincon phase and abandoned sometime during the Classic period. The canals were located on the Pleistocene terrace, a siting that maximized the irrigated area. Apparently the canals flowed year-round rather than seasonally. The number of alignments and their fill indicates that siltation was a problem for Hohokam irrigators, who had to periodically clean out the channels.

Elsewhere, the Tucson Basin Hohokam had to rely on other kinds of farming technology. Perhaps most often used was floodwater farming, in which short-term flow in secondary drainages created by runoff during summer thunderstorms was diverted to the fields (Fish

1995). Descriptions of similar techniques used by O'odham peoples and other traditional farmers of the historical period provide models for understanding how the Hohokam farmed by this method. Earthen, brush, and stone diversion dams were used to divert runoff from the slopes into secondary drainages and thence to the fields by means of ditches. Simple ditches and weirs were also used to divert water from *ciénegas*, springs, and artificially impounded reservoirs (Castetter and Bell 1942; Nabhan 1979, 1986; Rea 1983; Sheridan and Nabhan 1978). The Tohono O'odham practiced a technique called *ak-chin* farming. *Ak-chin* is a Piman word for the alluvial fan at the mouth of an arroyo. Agricultural fields were located on these aprons of fertile soil and were watered by rainfall runoff, sometimes directed by brush or stone dams and simple ditches. Fields could also be watered when streams overflowed their banks (Reid and Whittlesey 1997:77). The Hohokam probably used similar methods (Bernard-Shaw 1988; Ciolek-Torrello and Nials 1987; Fish and Nabhan 1991; Waters and Field 1986).

Conservation techniques for dry farming included rock-pile fields and terraces. Many portions of the *bajada* slopes of the Tucson Basin and adjacent areas were too distant from water sources or lacked the potential for simple catchment devices and were dry farmed. Hundreds of acres in these areas were devoted to cultivation through building simple rock piles that trapped and conserved direct moisture and also protected the growing plants. Plants with high moisture requirements could not be grown by this method, but agave and possibly cactus were grown by the rock-pile technique. Huge rock-pile fields occur throughout the Tucson Basin, in the Marana area on the *bajada* of the Tortolita Mountains, in the southern Tucson Basin, and in the Picacho Mountains area (Whittlesey et al. 1994:177). Smaller fields were located elsewhere. Roasting pits for cooking agave hearts were scattered throughout these fields, and some were as large as 40 m in diameter (Fish 1995:105).

Terraced hillsides or *trincheras* are found in many areas of the southern desert. Although these constructions were used for multiple purposes, including habitation, it is possible that at least some were used for dry farming (Fish 1995; Fish et al. 1984, 1985). These may have been used as "dooryard gardens," planted in crops requiring particular protection (Fish et al. 1985). In Mexico, such dooryard crops include beans, tobacco, squash, onions, and herbs (Beals 1946:20-27; Pennington 1969:89-93). Beans, chile, tobacco, and other plants may have been grown in such fashion by the Hohokam. Also called "pot gardens," they may have been watered directly by hand. Water also may have been directed onto terraced areas at the hill base (Fish 1995:105).

An important aspect of farming about which we know very little is the control and allocation of water and the mechanisms by which these tasks were accomplished. A considerable literature has built up concerning the relation between irrigation canals and social complexity among the Hohokam of the Phoenix Basin. Archaeologists often point to the need for communal labor in constructing and maintaining irrigation canals and the political ramifications of water management and allocation. For the Tucson Basin Hohokam, this was probably less of an issue than for the farmers of the Phoenix area.

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An important possibility that has yet to be fully explored is the role of ball courts in the management of water. There is a clear riverine emphasis on the distribution of ball courts. They occur primarily along the major rivers of southern Arizona. The few that are located away from rivers tend to be associated with major tributary washes, such as the Cañada del Oro Wash and Brawley Wash in the Tucson area. Courts also tend to occur near major riverine confluences or at confluences with major tributaries, such as the Santa Cruz and Rillito Rivers (Whittlesey 1998c:615). The ball game may have been linked in some fashion to ritual performances relating to the control and distribution of water. Lansing (1991) has discussed a similar phenomenon in modern Bali, in which a system of water temples located at strategic points within irrigation systems controls the distribution of irrigation water. Although archaeologists have discussed the role of irrigation in platform-mound construction (e.g., Craig 1995; Doyel 1974, 1980; Gregory and Nials 1985), they have yet to conduct similar studies of ball courts. The importance of water in Hohokam ideology and symbolism is discussed more fully below.

Crops that were grown include domesticated plants (maize [corn], beans, and squash of several varieties, tobacco, and cotton). Maize was obviously important to the Tucson Basin Hohokam, occurring in high percentages at almost all habitation sites and in many features (Gasser and Kwiatkowski 1991:425). Gasser and Kwiatkowski (1991:217) have suggested that, because the Tucson Basin is slightly cooler and wetter than the Salt and Gila River valleys, production of certain crops may have been enhanced. Beans, in particular, are much more common among flotation samples recovered from Tucson Basin archaeological sites than elsewhere. A suite of cultivated "wild" or semidomesticated plants was also grown. These include agave, little barley (*Hordeum pusillum*), wild tobacco (*Nicotiana trigonophylla*), amaranth, spiderling (*Boerhaavia* spp.), a variety of chenopods and cactus, and possibly tansy mustard and other plants (Bohrer 1991; Fish and Nabhan 1991:46).

In summary, the agricultural landscape of ancient times can be imagined as a mosaic of green and well-watered fields along the rivers, secondary streams, and alluvial fans. Crops requiring considerable water—corn, beans, squash, tobacco, cotton, and cultivated and encouraged plants such as little barley—were grown in the irrigated fields. Lush vegetation marked the courses of irrigation ditches and the margins of cienegas or marshy areas, and red-winged blackbirds sang among the cattails. Agricultural weeds, many of which had edible parts and seeds, sprang up in the disturbed fields and sunflowers raised their golden heads to the sun. On the rocky *bajada* slopes, less lush but extensive dry-farming fields of agave spread into the distance. Many Hohokam farmers simply walked to their fields each day, but field houses were also built among the fields, providing temporary shelter wherever the distances from the villages to the fields was too far to travel daily. Families camped in the fields while tending the growing crops and harvesting them. Women, children, and men all contributed in some way to the production of food, and even the littlest children could help to scare away rabbits and crows.

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Thus we can picture what it must have been like in the agricultural fields located near the Tanque Verde Wash settlement in the eastern Tucson Basin, where centuries later archaeologists recovered a rich and diverse collection of cultivated and encouraged plants. The Hohokam living there during the Rincon phase produced three varieties of corn, three kinds of beans (common, tepary, and jack beans), two kinds of squash (cushaw and summer squash), bottle gourd, cotton, agave, and amaranth. No doubt because of the richness of their fields, collected resources like saguaro and mesquite were relatively unimportant, indicating the importance of farming at this settlement (Miksicek 1986:392).

Today, few traces of this landscape remain. The bed of the Santa Cruz River is dry, and the dense mesquite bosques that once crowded the bottomland have disappeared (Whittlesey 1998e). Archaeologists must use a variety of techniques to reconstruct the ancient agricultural landscape. Many Hohokam canals are visible today, particularly those in the Phoenix area that were long, deep, and well maintained over hundreds of years. Others, particularly those in the Tucson area, have been buried by centuries of deposition since their abandonment and must be discovered by archaeological excavation, usually by means of deep backhoe trenches. Ancient pollen and macrobotanical remains—large plant parts such as seeds, leaves, and stems, which are usually charred, and charcoal—are analyzed by specialists to determine the plants that were cultivated. The presence of agricultural weeds is a good clue that farming took place nearby. At the Hawk's Nest site, a late Pioneer–early Colonial period farmstead, for example, archaeologists recovered corn pollen and pollen from weedy plants that are indicative of agricultural disturbance (Fish 1989a, 1989b).

### Resource Procurement: Finding Sustenance and Support in the Plant, Animal, and Mineral Worlds

Another aspect of the Hohokam people's mastery over the desert land was their use of wild plants. Procurement activities encompass parts of subsistence and economy as they are traditionally viewed—how people obtain the resources they need to live, whether they are mineral, biotic, or social. *Procurement space* (Zedeño 1997) involves the territory, resource locations, and landmarks created in the use of the environment as a source of food and nonfood resources. It is important to recognize that the territories used for resource procurement and for habitation may not necessarily coincide.

The Sonoran Desert may at first glance seem a particularly poor source of nutritious foods, but its prickly and thorny plants are deceptive. Many desert plants, particularly cactus and leguminous trees, provide valuable food resources (Reid and Whittlesey 1997). The paloverde-cactus-mixed scrub series of the Arizona Upland subunit, which is found throughout the upper *bajada* slopes in the Tucson Basin, not only represents the biologist's "classic" Sonoran Desert environment, it was also the one most heavily used by the Hohokam. The richness and diversity of cactus, shrubs, trees, and herbaceous annuals in this series is striking (Fish and Nabhan 1991:40). Prickly pear fruit, saguaro, cholla, smaller cactus, mesquite and palo verde



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beans, screwbean, ironwood, jojoba, yucca, and agave were well-used plants of this zone. Animal species of this environmental zone were also diverse and exploited by the Hohokam.

The riparian habitats along the Santa Cruz, West Branch of the Santa Cruz, and Rillito Rivers and the secondary watercourses such as the Cañada del Oro, Tanque Verde, Pantano, and Agua Caliente Washes were another lush and well-used environmental zone with high plant and animal diversity (Rea 1983). Higher water tables, beaver ponds, and more permanent flow in prehistoric times created dense, lush vegetation including deciduous and annual trees, thick mesquite *bosques*, and water-loving plants such as sedges and cattails (Whittlesey 1998e). Aquatic animals, birds, and fish inhabiting this zone were the target of Hohokam hunters and fishers (Fish and Gillespie 1987).

Looking at the ways in which O'odham peoples traditionally prepared foods of the Sonoran Desert may help to approximate how the Hohokam might have prepared them. Mesquite bean pods and those of other leguminous trees were ground into slightly sweet flour that could then be shaped into unbaked, breadlike cakes, roasted in ashes, or mixed with water to make a drink. Mesquite foods were relatively easy to prepare and can be eaten without cooking—an important feature in an environment where fuel wood was always scarce (Reid and Whittlesey 1997:77–78). Cactus were used in many different ways. Fresh cholla buds were roasted; saguaro and prickly pear fruits were dried, boiled into syrup, and fermented into alcoholic drinks. The seeds were saved and formed into cakes. Weedy annual plants provided greens, and the seeds of many plants—spiderling, amaranth, goosefoot, saltbush, and diverse grasses—were parched and ground into flour (Fish and Donaldson 1991; Reid and Whittlesey 1997).

The Hohokam relied less intensively on hunting than other prehistoric peoples of the Southwest. Nonetheless, large animals, such as deer, pronghorn, and bighorn sheep, and small animals, particularly rabbits and other rodents, were regularly hunted. Fish, birds, reptiles, amphibians, and even insects were consumed (Szuter 1991). Deer and rabbits, however, are the two animals that occur repeatedly in faunal collections from Hohokam sites.

As the Hohokam modified their environment through farming and encouraging the growth of wild plants, they created new habitats for plant and animal species that in turn provided the Hohokam with foodstuffs. Suzanne Fish (1982:6) has described this process:

In the creation of irrigated fields, the Hohokam created much more than the means for producing formal cultigens. They provided a unique habitat in which diverse herbaceous species from a variety of natural associations could be concentrated within easy reach. . . . Through selective removal or encouragement and by tolerance of both annuals and perennials, prehistoric fields may well have been the richest, most varied, and most predictable source of wild edible foods."

The Hohokam also created a unique habitat for animals. Rodents inhabited the agricultural fields in far greater numbers than elsewhere, and indeed the fields may have been planted in ways that deliberately encouraged colonization by rabbits (Szuter 1991). Linares (1976:332) has argued that the hunting of animals in this fashion created a culturally produced niche that substituted for the domesticated animals of the Old World. "Garden hunting," as this kind of hunting is called, served more than one purpose. Trapping of these animals simultaneously provided a ready source of protein and eliminated the pesky rodents and protected the ripening crops (Szuter 1991).

Little evidence exists for prehistoric hunting technologies. Ethnographic analogy tells us that people used snares, traps, and nets to obtain rabbits and other small game, but these were made of perishable materials that did not survive in the archaeological record. Bows and arrows were used to hunt larger game (Szuter 1991:279).

Hohokam hunters and food gatherers no doubt modified the environment in various ways in their activities, but the modifications they created were ephemeral compared to their dwellings and agricultural features. The material culture associated with Tohono O'odham cactus camps is an example of how a resource that may have been extremely important was procured and processed leaving few traces on the land. Cactus camps were established on the *bajada* slopes where saguaro was abundant when the fruit ripened in June. The entire family usually went on these expeditions, transferring the regular community life to the camp. While the women collected and processed the cactus, the men hunted (Castetter and Underhill 1935:14). Processing the fruit in the camps was necessary to prevent spoilage and prepare it for storage.

The fruits were collected with simple tools made of saguaro ribs lashed together with agave fibers (and later, with wire) and baskets. One large basket was propped into an ocotillo bush at a central point in the cactus stand to collect the fruit. The fruits were rolled on the ground to remove the stickers, and split open to reveal the bright red pulp. The pulp was placed in a water-tight basket and soaked to remove the seeds. Then the pulp was strained and the juice boiled in a pot to make syrup. The pulp and seeds were saved and prepared in various ways (Castetter and Underhill 1935:20-21). Few of these tools would have survived in the archaeological record, with the exception of the ceramic pots.

The Hohokam no doubt established field houses where activities much like those taking place in Tohono O'odham cactus camps occurred. Many of the small and informal houses, lacking entries, well-defined hearths, and well-constructed superstructures, no doubt were short-term habitations for collecting and processing resources (Czaplicki and Ravesloot 1989a; Ferg et al. 1984; Gardiner 1989; Huckell et al. 1987:83). Another kind of landscape modification used in preparing cultivated and wild agave and possibly other collected wild resources, such as cholla, were roasting pits. Large roasting pits were located in rock-pile fields (Fish et al. 1985) and on mountain slopes away from the fields in areas where wild agave grows.

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Many of the plants collected by the Hohokam probably had medicinal properties and were used for craft purposes as well as for food uses. Saguaro, mesquite, and ocotillo were plants used heavily in constructing Hohokam houses and as fuelwood. Tohono O'odham ethnography describes many of the plants that the Hohokam may also have used in making essential tools and equipment (Castetter and Underhill 1935). Willow, devil's claw, yucca, sotol, beargrass, and agave were used in basketry and woven items. Medicinal plants included creosote bush, a universal remedy for virtually everything that ailed the Tohono O'odham; canaigre root (*Rumex hymenosepalus*); mistletoe (*Phoradenron* sp.); and dandelion.

As with so many other aspects of life, ritual activities no doubt reinforced and maintained the hunting and collecting practices of the Hohokam. Fetishes, petroglyphs, and other aspects of material culture are associated with hunting magic among many prehistoric and historical-period cultures of the Southwest. The Tohono O'odham, for example, made effigies of the wild plant fruits they desired and planted them in the gathering grounds after a night of ritual singing (Castetter and Underhill 1935:13). Little can be said of such practices among the Hohokam.

Of course, nonbiological resources were also an important part of resource procurement for the Hohokam. Clay; stone for making mealing equipment, knives, and arrow points; sand and stone for tempering pottery; and mineral pigments for decorating pots and other objects were important mineral resources used by the Hohokam. Most stone was taken locally from sources of raw material; quarries for collecting stone are found in the mountains near Tucson, for example (Gardiner and Huckell 1989).

Procurement of marine shell from the Gulf of California, production into various ornaments, and distribution of raw shell and manufactured shell objects were critical activities in the Hohokam economic system. We are unsure whether the Hohokam made trips to the gulf to procure the shell themselves, or interacted with other populations, notably the Trincheras people, who acted as middlemen. Shell-procurement sites are found along the coast, indicating that some people traveled directly there to obtain shell, as does the recovery of marine objects such as worm casts and crab claws at Hohokam shell-working sites (Marmaduke 1993). In addition, there are design similarities between Hohokam pottery and Trincheras petroglyphs, indicating some connection between people of these two cultures (Bowen 1972; Howard 1993; Lindauer and Zaslow 1994; McGuire and Howard 1987).

Settlements in the Papaguería and northward toward the Phoenix area were evidently devoted to working quantities of marine shell into ornaments. Excavations at Gu Achi and near Kaka and Stoa Pitk in the Papaguería recovered quantities of shell, including extensive deposits of manufacturing debris (Masse 1980; McGuire and Mayro 1978). Entire villages seem to have been dedicated to the production of shell ornaments. Shelltown and the Hind site, located on Santa Rosa Wash south of the confluence with the Santa Cruz River, yielded quantities of shell debris (Marmaduke and Martynec 1993). House floors were covered with shell debitage and shell dust, along with tool kits specialized for the manufacture of bracelets. Finished bracelets



*Photo courtesy of Arizona State Museum*

*An illustration of the sequence of shell bracelet manufacturing from its initial grinding shape to the intricately carved end product. Shell bracelets and other items were produced by the Hohokam and traded throughout the southwest.*

were rare, however, indicating that they were exported (Howard 1993). Regardless of their role as symbols of Hohokam ideology, cultural beliefs, and religious values, marine-shell ornaments were also distributed across enormous distances to people of other cultures living throughout the Southwest.

In summary, the Hohokam developed a rich resource base of wild and semidomesticated foods, which were collected directly and which grew in the cultivated field zone that may have been created specifically to increase the diversity of plant and animal resources. Field houses, more ephemeral collecting camps, and roasting pits are among the landscape modifications used to procure and process resources. Mineral resources were quarried from various sources of raw materials. Shell was an important resource that played a large role in Hohokam identity and economy and which was the focus of craft specialization and wide distribution.

### **The Sacred Landscape**

Hohokam ideology, cosmology, and ritual supported and structured many aspects of life. As McPherson (1992:75) has written, "All of life is a metaphor in which one reenacts the spiritual through the physical. Places, wind and water, seasons and climate, objects, people, and other living things are thought of in terms of qualities important to [cultural] values." The land and its inhabitants form "a web of life that is both physical and supernatural." The sacred landscape is a physical representation or symbol of the sacred world, a mnemonic device for understanding the tenets of religion and ideology, and a context for enacting religious rituals. The functions of the sacred landscape are also multiple. By enacting rituals and acting in tradition-prescribed ways with reference to the land, a people not only perform the basic ceremonies of their beliefs, but reinforce their values and keep the secular world running smoothly. "Failure to adhere to these principles," McPherson (1992:75) has written, "leads to the most disastrous of all problems in traditional culture—a failure of power, prayers, and protection."

In this way, religion and ritual can reinforce cultural attitudes toward the environment in important ways. Ritual assists people in conserving the land, protecting it, and keeping it producing—an environmental ethic and a form of ecological conservation that can be extremely effective. A good example of this is provided by Lansing (1991) in his study of Balinese water temples. The temples and their priests controlled the distribution of irrigation water, setting irrigation schedules and cropping patterns. When crop- and water-management techniques inspired by the Green Revolution were substituted for the traditional water-temple management system, the results were disastrous. There were unprecedented water shortages and outbreaks of rice pests and diseases. Ritual served the practical function of preventing such afflictions, ensuring continued productivity and a solid agricultural base, as well as its more spiritual functions (see also Nazarea [ed. 1999] and McCay and Acheson [1987] for a number of similar ethnoecological studies showing this practical, ecological value of ritual and religion).

The sacred landscape can be thought of as the totality of *ritual space* (Zedeño 1997), the landscape modifications of this space (ceremonial structures and related features), and the unmodified landmarks that have important sacred connotations. The sacred landscape has an important cognitive dimension as well, but the belief system central to religion is not often visible to archaeologists. It must be inferred from other aspects of the sacred landscape. It is also important to remember that in most traditional cultures, religion is not something set apart from daily life, but is intricately interwoven with all aspects of life, from social organization to economy (Renfrew 1994a).

This section describes what archaeologists know about the Hohokam sacred landscape and speculates on some of its functions. It is impossible to know many details of Hohokam ideology and ceremonialism, but much can be inferred from landscape modifications, the ritual component of the built environment, and the symbolism in art work and crafts. Renfrew and Bahn (1991:359–360, also Renfrew 1994a:51–52) have described archaeological indicators of ritual that help us to understand when we are dealing with aspects of the religious landscape. Four main indicators are (1) the focusing of attention (the ritual may take place in a place with special associations or in a special building), (2) a boundary zone between this world and the next (there may be concepts of cleanliness and pollution associated with sacred and profane acts), (3) the presence of the deity (in images and iconography), and (4) participation and offering (prayer, devices for inducing religious experiences, sacrifice, food and drink, and so on). In addition, Renfrew (1994a:52) has alerted us to the important point that mortuary practices are an integral part of religious belief and performance.

Preucel (1996:125) has suggested that, as a people probably originating in Mesoamerica, the Hohokam shared an overarching “Mesoamerican worldview”—a coherent set of ideologies that grounded social action in tradition and mythology. Central to this worldview was a conception of the cosmos as organized in terms of several vertical and horizontal dimensions (Preucel 1996:125). Vertical space was divided into three segments (the upperworld or heaven, the middleworld or earth’s surface, and the underworld); horizontal space was divided into four segments representing the cardinal directions. Cosmological and astronomical events were associated with this organization. Specific “pathways”—caves, mountains, and trees—mediated between these dimensions (Gillespie 1993).

Various themes and elements—earth, fire, water, and air—appear to have structured Hohokam ritual, and they are symbolized in ritual performances, iconography, the built environment, and sacred landmarks (Whittlesey 1998b:708). Schroeder (1979) was one of the first archaeologists to characterize the Hohokam as earth-oriented people. Symbolizing earth and perhaps the emergence from the underworld are Hohokam dwellings, which were excavated into the earth and required the resident to step or walk downward in order to enter them, and ball courts and platform mounds, which were made of earth. Snakes, which appear on many items of material culture ranging from shell bracelets to pottery, may have mediated between humans and the underworld or the gods (Preucel 1996:126), as they do with the Hopi people.



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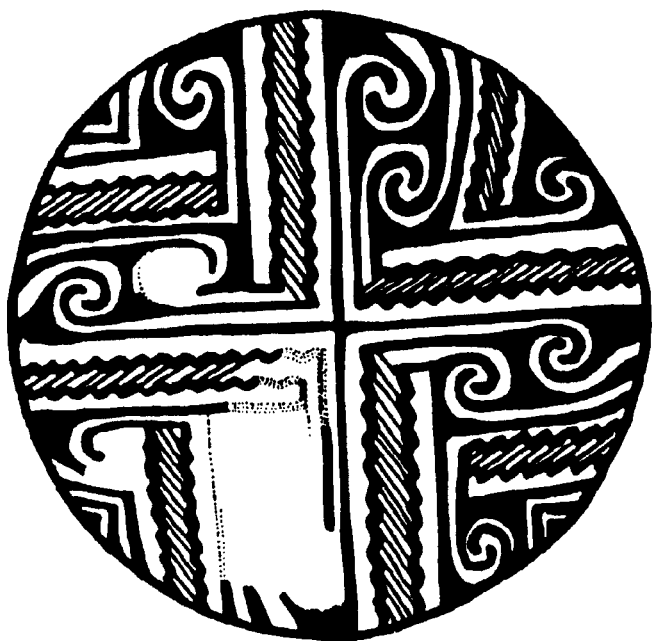
Caves may have also represented the emergence from the underworld, as Preucel (1996:126) has pointed out, and caches left in caves may indicate their ritual importance (Ferg and Mead 1993; Haury 1945; Russell 1975).

Fire was extremely important and pervaded many aspects of Hohokam ritual. Fire was used in cremation, possibly in ritual incineration of the houses of the dead, to prepare ritual offerings, and in burning of mineral substances during ritual performances, perhaps to create color symbolism (Haury 1976; Hawley 1965).

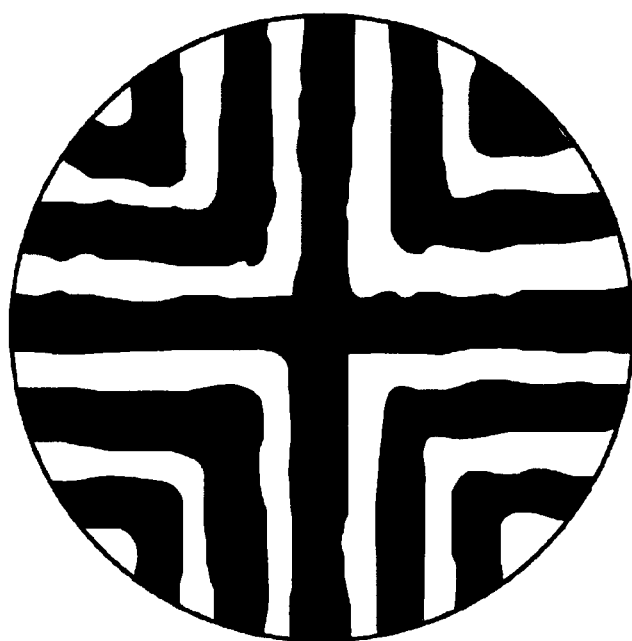
Water symbolism was also important. Water was symbolized in reflective items such as pyrite mirrors and in the shiny surfaces of schist-tempered pottery. Birds and animals associated with water—frogs and waterbirds in particular—are endlessly repeated in Hohokam pottery designs and in their shell ornaments and stonework. Marine shell, of course, which was a focus of Hohokam crafts production (Howard 1993), is obviously representative of water. Indeed, marine shell may have been a core symbol of Hohokam cultural identity. Springs may also have had important sacred connotations for the Hohokam, and were often marked by petroglyph panels (e.g., Wallace and Holmlund 1986).

Air may have been represented by incense burning—incense burners of stone and pottery being common items of material culture—by mountains and mountain-top shrines, and perhaps by platform mounds, which lifted the people up to the sky during ritual celebrations. It is likely that Gila Butte, where the micaceous schist that gave pottery its shiny surface sheen was quarried, was a sacred mountain landmark. The linking of particular stone resources with ritual or symbolic identity and cultural values is common in traditional cultural landscapes. Tilley (1994:53) discusses a similar phenomenon among Australian aboriginal peoples. Quarrying stone for axes at places thought to represent the bones of the ancestors is a symbolic act that confers meaning upon the stone axes, which retain the power of their source. Sources of schist in the Gila River homeland may have held similar meaning to the Hohokam, and may have held earth symbolism as well.

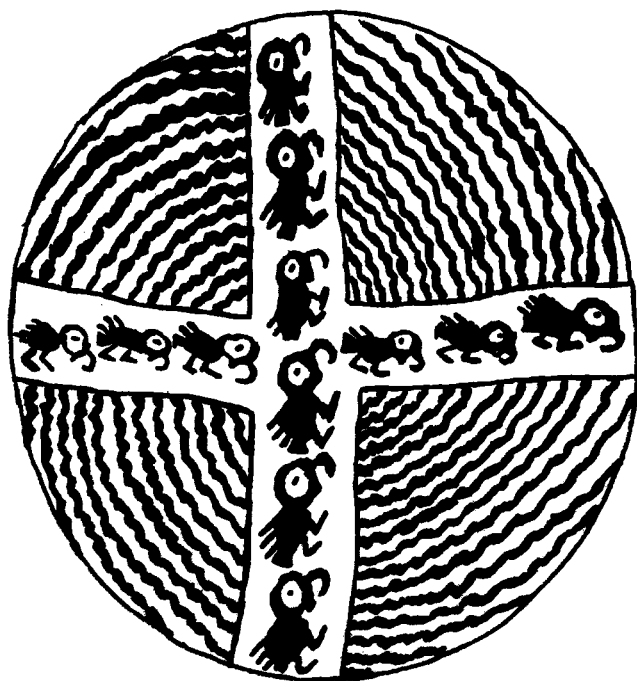
Buildings, material culture, and village organization may have reflected these directional, cosmological, and elemental aspects. The cardinal orientation of ball courts and large villages such as Snaketown has been noted (Wilcox et al. 1981). The quartered design fields of painted pottery (Figure 4) may reflect the cardinal orientation and division of the cosmos into four quarters (Doyel 1991:244; Kelley 1966). Figurines may have served a role as offerings to enhance the fertility of both agricultural fields and women (Neitzel 1991:191). Many figurines are female, and some depict obviously pregnant females (Thomas and King 1985). Figurines were made of clay from canals, wells, or springs, unlike the clay from which domestic pottery containers were made (Neitzel 1991; Thomas and King 1985:721), suggesting water symbolism. It is possible that figurines were associated with ancestor veneration, which would certainly fit with other aspects of Hohokam social organization, in which household organization, land tenure, and mortuary practices indicate the importance of lineage and kinship.



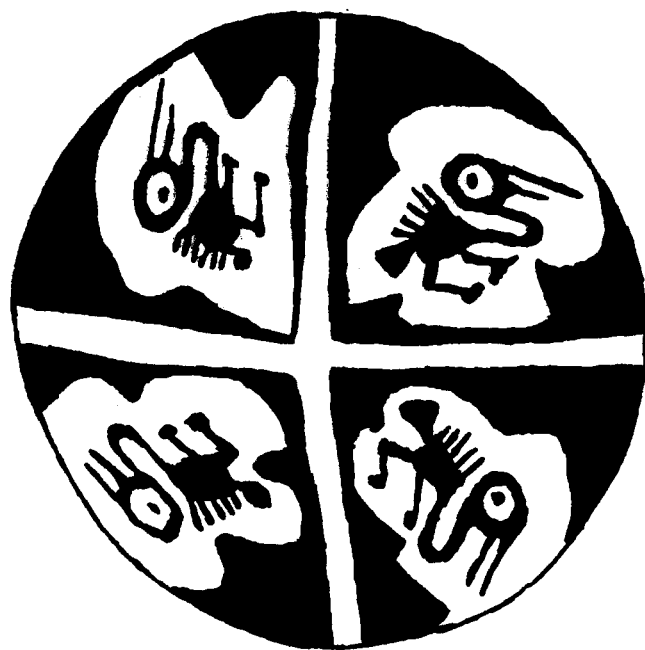
a



b



c



d

**Figure 4**

Quartered design layouts in Hohokam painted vessels: (a-b) quartered layouts (Estrella Red-on-gray from Haury [1965:Figure 111] and Rincon Red-on-brown from Wallace [1986:Figure 6.6c]); (c-d) negative quartered layouts (Santa Cruz Red-on-buff from Haury [1976:Figure 12.28e] and Haury [1965:Plate CLVIIIj]).

Haury (1976:266) has suggested that figurines were ritual offerings, perhaps "a form of house blessing, a means of insuring increase, of the family of crops, and through these, securing the fulfillment of the society's needs." Caches of figurines have been found in the Tucson area (Thomas and King 1985), suggesting that, whatever function they served in Hohokam society of the Phoenix Basin, it was replicated by the Tucson Basin Hohokam.

Thomas and King (1985) describe two remarkable figurine caches from the Phoenix area. They included possible architectural models and miniature representations of pottery vessels, manos and metates, and baskets in addition to figurines. The authors suggest a role for such depictions in altar scenes, which is a typical use of ceramic figurines and sculpture in Mexican ceramics.

Haury (1976:288) has described how censers and palettes may have functioned in Hohokam ritual. Palettes, which were often were elaborately decorated, served as a sort of "altar piece" or support for censers, which were arranged on them in various ways depending on palette size. Incense and various other substances were burned in the censers. The patterns of burning and smudging on both censers and palettes lead to these conclusions. Palettes probably were also used alone. Many palettes have crusts of sintered lead or lead and other minerals (Hawley 1965). Haury (1976:288) has suggested that the process of burning changed the color of the lead mineral from white to red, which may have been the desired magical effect.

The most obvious aspect of the sacred landscape—the most notable landscape modification—was the Hohokam ball court. These elliptical, embanked structures of earth typically contained three markers, one at each end and one in the center. The featureless floors were slightly concave. Through time, courts became standardized into two size classes, small and large (Wilcox 1991b:113).

Although extremely variable in orientation, courts were typically oriented north-south or east-west, although this also varied through time (Wilcox 1991b:117). In the Tucson Basin, small and large courts were widely distributed (Doelle and Wallace 1991:302). Court orientation may have been keyed to calendrical or astronomical events, or to a complex economic exchange system (Wilcox 1991b:119). Rubber balls probably made of *guayule* were used in the game (Haury 1937).

We are unsure exactly how the ball game was linked to ritual and ideology, but it likely functioned as it did in Mesoamerica. Wilcox and Sternberg (1983:212) have suggested that courts may have been tied to specific mythological or cosmological events. According to Preucel (1996:126), "The ball game was probably played to ensure the proper functioning of the universe through the symbolic reenactment of the diurnal cycle of day and night (Gillespie 1991:319)." It may have played an important role in agricultural fertility as well. Figurines help us to understand details of dress among ball players and decipher how the game was played (Ekholm 1991; Wilcox and Sternberg 1983).



*Photo courtesy of Arizona State Museum*

*Stone censers. Ash stains in the base of these intricately carved stone censers may be evidence that they were used to burn incense during ceremonies at Snaketown.*

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In the Tucson Basin, the ball game appears to have been a relatively rapid innovation, as it apparently was across most of Arizona (Wilcox and Sternberg 1983). Most courts were built in the Colonial period, either in the Cañada del Oro or Rillito phases (Doelle and Wallace 1991:302). They seem to have declined just as rapidly. By the Rincon phase, most ball courts had fallen into disuse. Whereas formerly ball courts had been the center of village organization, in Rincon times settlement shifted away from them (Doelle and Wallace 1991:319).

Doyel (1991:249, 1992:349) has suggested that drinking of fermented beverages, particularly saguaro wine, was part of Hohokam ritual practices. The drinking of saguaro wine was an important rain-making ceremony among the Tohono O'odham (Underhill 1946). The data supporting this are extremely scanty (the presence of large pits at Snaketown of otherwise indeterminate function that may have been used to warm jars of wine, speeding the fermenting process [Haury 1976:156]). It is likely that the Hohokam indeed prepared such beverages, perhaps from agave as well as from saguaro fruits, but we cannot say for certain that this was the case.

The cremation mortuary ritual was an integral part of the Hohokam religious system. As McGuire (1992:194) has written, burial ritual not only "was a manifestation of Hohokam ideology," it also "played a role in the negotiation of power relations in Hohokam society." The great care taken with the treatment of the dead reflects a deep concern with preparation for the afterlife (Reid and Whittlesey 1997:93). The dead were cremated in special areas devoted to this purpose, which may have been associated with village segments. A wooden platform was probably prepared to hold the body and its offerings, typically ceramic vessels, arrow points, shell ornaments, and palettes. The ashes were then buried in place (primary cremation) or removed for burial in another location (secondary cremation). The ashes may have been placed in a ceramic jar and covered with an inverted bowl (urn cremation) or in a pit (pit cremation) for burial. According to Haury (1976:171), the excessively small amount of ashes in most cremations and the extreme comminution suggests "a mortuary custom that specified the ashes of a single person were to be split into a number of small lots for separate burial, not unlike the practices of the Colorado River Yumans (Spier 1933:303)," and may indicate that the ashes were stirred during or after burning and that the cremation temperatures were very high.

There was considerable variability in this general practice, and change through time in its execution. Pit cremations appear to have been more common during the earliest phases of the pre-Classic period. At the Picacho Pass site near the Picacho Mountains northeast of Tucson, primary and secondary cremations were found in small, basin-shaped pits along with sherds. One cremation was covered with an inverted bowl. Clusters of cremations form cemetery plots possibly associated with individual house clusters (Greenwald and Ciolek-Torrello 1987:164). At the Dakota Wash site, there were 21 secondary cremations in a discrete cemetery area (Craig 1988).



Primary and secondary cremation continued during the Rillito phase. At the Water World site in Avra Valley, there was considerable diversity in secondary cremations. Urn cremations, mixed lots of cremated remains and sherds, and cremations with inverted bowl covers were present (Hueglin 1989:147). Similarly varied means of disposal of the dead were present at the Hodges Ruin (Kelly et al. 1978) and at Punta de Agua (Greenleaf 1975). Cremations occur in clusters at the larger excavated sites (Whittlesey et al. 1994:146). Urn cremations seem to have become more frequent during the Rincon phase, although pit cremations continued (Whittlesey et al. 1994:147). The disparity between the number of cremations and the number of pit houses at Rincon phase sites has been noted (Whittlesey et al. 1994:149).

A small number of inhumations also occur throughout the Hohokam sequence, although cremation was always the more common practice. It is likely that variability in mortuary practices was based on differential status factors, perhaps as simple as the age and sex of the deceased, but the study of Hohokam mortuary practices is still in its infancy and is complicated by the fact that determining age, sex, and other biological characteristics is much more difficult with cremation than inhumation burials.

Huntington (1986) has suggested that two other practices were associated with mortuary ritual—the burning of the deceased's house and its belongings and so-called "empty" cremations, or burial urns without contents. The former notion is taken from traditional O'odham practices, in which a deceased person's house, or *ki*, and its contents are ritually burned. Certainly many excavated Hohokam houses have been burned, but it is difficult or impossible to link this to mortuary ritual. The same is true of the latter phenomenon, which Huntington (1986) discovered at the West Branch site.

In the Phoenix Basin, caches of objects—often deliberately broken and burned—were relatively common and indicate some sort of ritual offering. Haury (1976) describes a number of such caches, including ceramic and stone censers, solid animal figurines of clay, miniature ceramic vessels, effigy vessels of stone and clay, shell objects, and other items. These may have been sacred objects that were ritually disposed of after use in a ceremony, or simple offerings. They were not associated with human burials, however. Caches of the magnitude and complexity of those at Snaketown have yet to be discovered in the Tucson Basin. At West Branch, excavations in outdoor activity areas recovered ceramic vessels containing minerals (crystals and finely ground specular hematite) that could be considered offerings (Altschul et al. 1996).

Shrines were undoubtedly sacred landmarks at important places on the sacred landscape, but their discovery and study by archaeologists has generally been fortuitous. Red Cave, located in the northern end of the Whetstone Mountains, is a cave shrine that might have incorporated many aspects of Hohokam cosmology and ideology. The cave was purportedly discovered in the 1950s and rediscovered and reported in 1973 (Ferg and Mead 1993:1–2). The cave contains four discrete chambers. One of these, the Red Silt Room, contained a rimstone basin with a pool of water in which were 56 painted and plain sherd disks. On the rim of the basin were shell, turquoise, and other stone beads and pendants. In the red mud on the chamber



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floor were hundreds of other sherd disks and broken pottery vessels; more than 300 sherd disks and unworked sherds were collected (Ferg and Mead 1993:9). Arrows, cane tubes, reed cigarettes containing tobacco, corn cobs, and other perishable materials were also present. Dated pottery types indicate use during the Rincon phase (Ferg and Mead 1993:55).

This shrine embodies many aspects of ritual elements and iconography. It contains elements directly relating to earth and water. The smoking of tobacco has been linked to bringing rain by emulation among the Hopi (Titiev 1992) and can be seen as an air element. The cave's location on a mountain has other aspects of air symbolism. The color red has deep meaning in many prehistoric cultures, where it is often linked with death and the treatment of the dead. Red pigment evidently served a role in Hohokam funeral rites (Haury 1976:276). Ferg and Mead (1993:61) describe physical features of the cave that may express symbolic duality and possibly an emergence story:

To go down into the cave one has to go up onto the mountain. The person-sized opening between Entrance Room and Crawlway [two of the cave's chambers] is dramatic: a passage from one world to another, a small hole that opens into larger room. At the apparent end of a dry cave one finds the beginning of a wet cave. One goes from light to absolute dark in a place where people formerly emerged into this world, or perhaps a place where the dead exit from it.

Ferg and Mead (1993:61) further suggest the cave may have been both a hunting and a fertility shrine, another aspect of its dual nature (male and female).

Rock art is another aspect of the sacred landscape. We are interested not so much in the meaning of rock art, because it is difficult to "read" the symbols and imagery as one would a text, but in its spatial distribution and landscape relations (Bradley 1994). Hohokam rock art represents a specific set of images and designs that has been called the Gila style (Wallace and Holmlund 1986), and which differs radically from the earlier Archaic depictions. As farming-dependent peoples with a strong base in the land, the rock art of the Hohokam may have served as boundary markers of village farmlands or the limits of village territories, demarcating the physical boundaries of what may have been a concentric organization of the geographic and cosmic world, much in the way that Pueblo lands were centered on the village and arranged in concentric zones representing discrete activity and resource use areas around each village (Silko 1995). The location of petroglyph boulders in Hohokam fields suggests this function (Wallace 1996).

Rock art may also have marked important landmarks, places on the landscape where particular events in mythology and human history may have taken place. The persistent location of petroglyph panels with springs throughout the desert area may indicate that rock art also served this function. Rock art may be a symbolic form of communicating information about the location of important resources such as good hunting areas, trails, and water sources such as springs. These and other functions are discussed by Wallace and Holmlund (1986).

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Whittlesey (1998c:623) has suggested that the Hohokam belief system was a religious cult including water symbolism, snake and bird imagery, ritual practices involving burning, and the ball game. Doyel (1992:349) has labeled this Hohokam cult the "Rainbow Way." As Whittlesey (1998c:623) has pointed out, the Hohokam cult was similar in many ways to the Southern Cult or Southeastern Ceremonial Complex of the American Southeast, which included platform mounds, an elaborate mortuary ritual, a ball game, and a specific set of iconographic symbols (Waring and Holder 1968). The ultimate Mesoamerican derivation of both cults seems clear. The Hohokam and the Southern Cults were distributed over a broad area, and neither ethnic identity nor cultural affiliation was a criterion for cult membership. Moreover, it was integrated into the social order in diverse ways (Waring and Holder 1968:67). Thinking in terms of a religious cult may be a better way of approaching variability in the religious basis of Hohokam culture than seeking a uniform "Hohokam culture" over a broad region. Local populations may have participated in the cult in varying ways and adopted different cult aspects.

### **The Social and Political Landscapes: Relationships among Peoples and Organization**

People are, of course, an integral part of the landscape, because human beings do not live in isolation. In considering the social and political landscapes we are concerned with human relationships, among the Hohokam themselves and among the Hohokam and other prehistoric cultures of the Southwest. In the built environment we can often see reflected the social organization of people, from their kinship and family relations to larger social groups, and the political principles that governed them—what Jackson (1984) called the political landscape. In the political landscape, particularly in public spaces that remind people of their civic duties, the social hierarchy is displayed (Jackson 1984:18–19). Whether in prehistory or history, monuments encode information about the formation and stabilization of attitudes toward the world (Tilley 1994; Whittlesey 1998a:22). Power relations are often reflected in the built environment, and they can be a method of social control (Jackson 1984; Mrozowski and Beaudry 1990; Tilley 1994:205–206). When reflected in the built environment, "ideology takes social relations and makes them appear to be resident in nature or history, which makes them apparently inevitable" (Leone 1984:26).

This section takes up some of the more abstract issues of Hohokam culture: topics of their origins and social identity; regional differentiation; political and social organization, including domestic organization, economy and exchange, and complexity and warfare.

### **Hohokam Origins and Social Identity**

Hohokam identity was undoubtedly intimately linked with their notions of origins, and also must have structured their relationships with other peoples. As we have discussed in other sections of the cultural resources overview for the SDCP, archaeologists have no very clear

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understanding of where and when Hohokam culture originated. There are two general hypotheses: that the Hohokam culture grew up locally from Late Archaic peoples who were living in southern Arizona, and that the Hohokam were immigrant people who originated from somewhere in what is today Mexico. The weight of the evidence today supports the second hypothesis. So many aspects of Hohokam culture, from their ideological and ritual framework to the size and complexity of their irrigation systems, have parallels in Mesoamerica that it is difficult to ignore their likely origin in this region.

No definitive knowledge exists concerning Hohokam origin myths and stories, for they have left behind no written language or oral history. If they were indeed a migrant people from coastal West Mexico, as many archaeologists believe, we can imagine that their cardinal orientation and directional symbolism emphasized the south, which is often associated with the color red. The emphasis on water in Hohokam ideology and iconography may also be associated with the ocean to the south. Some have imagined that the Hohokam may have originally traveled northward along the coast by boat, and thence overland to the interior deserts. This is not as far-fetched as might be thought, as boats sufficient for coastal and lake navigation were well known in Precolumbian Mesoamerica and South America. Marine-shell ornaments, so much a part of Hohokam life and death—found in cremations, ritually destroyed caches, and the focus of a specialized craft industry and distribution system—may have symbolized the core of Hohokam identity. The Hohokam may also have had a myth of an underworld emergence place, given the apparent importance of caves as sacred landmarks, such as Red Cave (Ferg and Mead 1993). All of this, of course, remains in the realm of supposition.

It is also possible that what archaeologists label "Hohokam culture" actually represented the adoption of a Mesoamerican ritual and domestic lifestyle by local populations, rather than an actual influx of people. Certainly the Tucson Basin was rather densely settled when the complex of traits we see as Hohokam emerged—buff ware ceramic technology, the Snaketown design style in painted pottery, shell jewelry, distinct vessel forms, courtyard groups, a unique figurine style, ball courts, trough metates, canal irrigation, formal domestic architecture, and platform mounds (Whittlesey 1996). It is likely that the people of the Tucson area had ancestral roots deep in the Archaic period, and embraced Hohokam ritual and other aspects of identity when these became widespread around A.D. 800. There is no evidence that there was a replacement of local populations by whole immigration.

There is no clear information about the relationship of the Tucson Basin people to other Hohokam living elsewhere. The old notion of a core and many outlying peripheries, of which the Tucson Basin was one, is giving way to the notion that the Tucson Basin represented a vigorous local culture of its own (Doelle and Wallace 1991; Whittlesey 1998c). Di Peso's older notion of the O'otam culture (e.g., Di Peso 1956) may still have applicability to the Hohokam of the Tucson Basin (Whittlesey 1995). Whatever its source or its meaning, many unique attributes—particularly pottery design styles, red-on-buff pottery tempered with micaceous schist, and shell ornaments—were distributed across large distances, whether by exchange, colonization, or other mechanisms. This implies a shared notion of cultural identity among

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peoples in dispersed areas. Certainly the Phoenix area must have remained a central place to the Tucson Basin Hohokam, and there were multiple connections between the two regions in interaction and material culture.

### **Regional Differentiation**

How Hohokam people were distributed across the various regions of the southern deserts lies at the core of cultural landscape relationships. Were all Hohokam of a single culture, regardless of where they lived? Or did the Hohokam of the Tucson Basin view themselves differently from Hohokam of the Phoenix area? And how did these conceptions affect relationships with the environment and the land? There have been three major views of Hohokam regional differentiation that attempt to address these issues.

The first model was articulated by archaeologists working at the Gila Pueblo Archaeological Foundation. This so-called "Gladwinian model" (Wilcox and Shenk 1977) proposed that the Hohokam culture spread from a hearth in the Gila River basin. Groups of Hohokam people moved out of this "core" area into similar and favorable environments, colonizing them during the Colonial period. During the Sedentary period, Hohokam culture retracted back into the core area (Gladwin and Gladwin 1933). The excavations at Snaketown (Gladwin et al. 1937) provided the source for the broadly distributed red-on-buff culture. Haury (1986:283) noted that it was the desert environment and Hohokam adaptation to it that conditioned the spread of Hohokam culture. For many years, when Snaketown was virtually the only excavated Hohokam site, it was possible to embrace this model of the Hohokam culture wholeheartedly. There was, however, dissatisfaction with this model (Wilcox and Shenk 1977).

Beginning in the 1970s with the advent of contract archaeology, a second model essentially replaced the Gladwinian model. This was the notion of core and peripheries (Wilcox and Shenk 1977) borrowed from modern world-systems theory, such as Wallerstein's (1974) model of the emergence of the capitalist world system in Europe. The core area, essentially the Gila-Salt Basin, was characterized by large-scale irrigation systems, higher population density, and a greater frequency of ritual paraphernalia and exotic items (Wilcox and Shenk 1977). The peripheries employed other agricultural technologies, had lower population densities, and less in the way of exotic goods. The core-periphery concept was used widely in the 1980s (e.g., Doyel and Plog 1980; Lerner 1984).

This model was not only inappropriate for the prehistoric Hohokam, it was used in ways its originators had not envisioned. The core-periphery model was derived from studies of modern or historical-period industrialized nations and is not appropriately applied to prehistoric societies. Moreover, the core-periphery relationship is one of economic and political dependency (Haas 1984; Wallerstein 1974). The periphery serves to supply the core with resources, whether they are marine, agricultural, mineral, or physical (Cressey and Stephens 1982). Peripheries are also surplus-producing areas (Paynter 1982). The core controls central

decision making, the establishment of colonies, and division of labor (Chase-Dunn 1981). As the core-periphery model was applied to the Hohokam, all of these processes were reversed. The core was seen to supply the peripheries with goods and services, for example (Wood and McAllister 1980). In short, the model was inappropriate (see discussion in Whittlesey [1998c]).

The third model was that of the Hohokam regional system, which also emerged during the explosive boom of contract archaeology in the deserts (Wilcox 1979). Wilcox proposed an alternative point of view that defined the Hohokam as a "regional system." "Research emphasis should then shift," Wilcox (1979:78) wrote, "from efforts to decide 'who are the Hohokam' to attempts to identify the systemic relations and interactions of the Hohokam" (Wilcox 1979:78). The regional system model excluded culture entirely from discussion of the Hohokam. As Lerner (1984:34-35) described the features and processes of the regional system model, "These concepts deal with the integration of socio-economic and socio-political processes rather than on culture trait patterning," and "The interaction of these processes has led to the development of systems which showed similarities over broad areas which were not necessarily culturally related."

Whittlesey (1998c) provided a fourth model, one that attempted to "unpack" Hohokam culture by examining its geographic, religious, economic, and social bases. The geographic basis concerns the environmental features of occupation areas, their various carrying capacities, and potential for agriculture of different kinds. For example, Whittlesey (1998c:621) asked whether the features of the so-called core, such as dense population, might not more appropriately be considered a product of the Phoenix Basin's great productive potential, particularly for irrigation farming. The religious basis of Hohokam culture concerns the ideological-ritual-iconographic system, which was centered on ball courts and exhibited considerable similarities to what has been called the Southern Cult. The economic basis of Hohokam culture concerns exchange in material objects, such as ceramics and shell, as various processes of population movement across the land. The social basis of Hohokam culture refers to its ethnic and social foundations.

When we employ some of these concepts, we find that the Tucson Basin emerges not as a "periphery," but as a vigorous, local variant of Hohokam culture with its own unique material culture, technology, organization, and iconography. Certainly there were parallels with the Hohokam "core" in courtyard groups, domestic organization, and ritual organization, but there was a unique local expression and most strikingly, a local ceramic tradition unparalleled in other areas that were occupied by the Hohokam. The red-on-brown painted pottery of the Tucson Basin was made in far greater quantities than any other region and exhibited certain particularities of expression not found elsewhere. The development of polychrome, white-slipped and black-painted variants of red-on-brown pottery, and red ware pottery during the Rincon phase is the most obvious example of this vigorous and unparalleled ceramic tradition (Whittlesey 1998c:611).





*Photo courtesy of Arizona State Museum*

*Examples of Classic Period Tucson Polychrome pottery from the University Indian Ruins near the Rillito River.*

The unique position of the Tucson Basin has been previously discussed by Doelle and Wallace (1991) and McGuire (1991). Although linked to the Phoenix area, the Tucson Basin was "a distinctive entity from earliest times," and between the two areas "the pace of change and the direction of influence and interaction were not always constant." The Tucson Basin may ultimately "have emerged as a regional center in its own right" (Doelle and Wallace 1991:280, 288).

### Political and Social Organization

#### Domestic Organization

We can see reflected in dwellings and their organization aspects of Hohokam domestic groups. The domestic group is a basic social unit organized for carrying out the functions of economic activities, reproduction, and shelter (Goody 1972). Households are a definitional subdivision of the domestic group. Goody (1972) equates the household with the domestic unit of consumption; households are identified with the activities centering on storage, preparation, and cooking of food. Domestic groups occupy and maintain functionally differentiated architectural units, they exhibit continuity through time, and they are governed by developmental cycles. Throughout the world, domestic groups are relatively small groups linked by bonds of kinship and marriage, and are typically extended families.

The courtyard groups that are the foundation of Hohokam site structure (Ciolek-Torrello 1988; Doelle et al. 1987; Doyel, ed. 1987; Henderson, ed. 1987; Howard 1982, 1985; Huntington 1986; Wilcox et al. 1981) undoubtedly were the residences of domestic groups (Ciolek-Torrello 1988:170). As the part of the built environment reflecting domestic organization most directly, courtyard groups can be seen as the sine qua non of "Hohokamness," the essence of what it meant to be Hohokam (Whittlesey 1998c:618). Courtyard groups consist of the corporate space "owned" by kin groups, and include houses, open work areas, public cooking areas (*hornos* and roasting pits), trash areas, and cemeteries (Whittlesey 1998c:618). Courtyard groups typically have functionally differentiated structures, usually one or more habitations and a pit house specialized for storage or other activities. Although houses were abandoned and remodeled through time and new ones were built, the spatial location of the courtyard remained constant.

Changes in courtyard groups have been attributed to the developmental cycle of domestic groups (Doelle et al. 1987; Howard 1985; Huntington 1988). As families grew larger with the addition of new members, marriages, and such processes, courtyards had to expand. The stability in location of courtyard groups indicates long-term maintenance of kinship relations as well as an ongoing land-tenure system.

### Economy and Exchange

Exchange of material goods is one medium by which people the world over facilitate the flow of economic resources and interact with each another. A considerable literature has built up concerning the role of exchange and redistribution among the Hohokam. The materialist bias of Hohokam archaeology has meant that most scholars have tried to link exchange solely with production and consumption and the political and social correlates of these activities; little consideration has been given to the role of ideology and ritual in the distribution of material goods (Whittlesey 1998d).

Painted pottery is a good example of this perspective. The old core-periphery and regional-system models of Hohokam culture saw painted red-on-buff pottery as moving outward from the Phoenix area core, which distributed it to outlying Hohokam colonies in the periphery and tied them economically to the core. Wallace and Holmlund (1982), for example, proposed that buff ware was an elite trade item. Its higher "value" in terms of requiring more effort to make than plain ware pottery (Abbott 1984) would have made buff ware a more valuable exchange item. Buff ware certainly exhibits morphological and technological characteristics that would have limited its use in domestic activities and linked it to ritual activities, from serving as burial vessels to incense burners. The emphasis on painted pottery ignores the enormous quantity of plain ware pottery tempered with crushed micaceous schist available only in the Phoenix Basin, which was distributed to Hohokam settlements across Arizona. Such pottery appears as far away as the Tonto Basin (Stark et al. 1995), for example.

The traditional view also sees ball courts as serving an important function in the exchange of material goods. Wilcox and Sternberg (1983:213), for example, proposed that ball courts served as focal points for a seasonal round of ceremonies that facilitated the distribution of bulk goods such as ceramics. They wrote, "The obligation to produce goods or services for ceremonies, when harnessed to a scheduled round of ceremonial events among a set of nearby communities would have created periodic pools of goods and the motivation to carry them to another place as gifts or presentations in a continuing series of reciprocal exchanges." We would expect to see this kind of system reflected in the local production of pottery at many different settlements, indeed perhaps everywhere that people lived more or less permanently.

This is not what we see archaeologically. Buff ware and schist-tempered plain ware pottery was evidently manufactured at a limited number of places in the Phoenix Basin and distributed widely (Whittlesey 1998d). David Abbott (personal communication 2000) has found good evidence for this in compositional analyses of clay chemistry and paste inclusions. Some pottery for cooking and storage, tempered with locally available rock and sand, was made locally to fulfill the demand for domestic containers. In the Tucson area, a relatively large quantity of red-on-brown pottery was also made. This, too, may have been manufactured in a limited number of settlements (Wallace and Heidke 1986). The increase in local red-on-brown ceramic production appears to have coincided with a decrease in the importation of buff ware from the Phoenix area (Doelle and Wallace 1991:321-322).

Ball courts and ceramics alike seem to have had deeper ritual and ideological significance to the Hohokam. Teague (1984:307) has argued that the ball court system was not economically significant to the Hohokam in terms of organizing long-distance trade. There is no evidence to bolster the belief that Hohokam ball courts served as centralized marketplaces for the periodic and regularized exchange of goods. Whittlesey (1998c) has argued that ball courts served broader ceremonial functions, perhaps related to water control, and that micaceous schist-tempered pottery embodied the essence of Hohokam identity, rather than representing some trade item valued solely for its economic value. The micaceous sparkle of the schist-tempered pottery may have held symbolic value, representing water, or its clear, bright color may have been linked to the sun and sky (Whittlesey 1998d:442). Pottery tempered with this material simultaneously symbolized basic cosmological concepts (water), important landscape features with deep mythological significance (such as Gila Butte), and linked the Hohokam with their sacred landscape. This was probably true for buff ware pottery as well.

### **Complexity, Elites, and Warfare**

Archaeologists have long debated the nature of Hohokam social and political organization. Were they characterized by an authoritarian system verging on state status, or were they simple, village peasant farmers? The jury remains out on this question. Some of the features that archaeologists have pointed to as suggestive of complexity include the labor required to build platform mounds and ball courts; the irrigation system of the Phoenix Basin Hohokam, which would have required considerable labor to build and maintain and which implied the need for centralized control of water allocation; and the large-scale procurement, manufacture, and distribution of economic goods such as buff ware pottery and marine shell (e.g., Abbott 1984; Bayman 1996; Fish and Fish 1991; McGuire 1992; McGuire and Howard 1987; Neitzel 1991; Wilcox 1991a).

The large communities of the Phoenix Basin based on canal irrigation were absent in the Tucson area, as we have seen. Cooperative labor and communal decision making probably was necessary nevertheless to allocate water and land among the smaller irrigation and floodwater farming villages of the Tucson Basin (Fish 1995, 1996). Certainly ball courts reflect the need for communal labor. Doelle and Wallace (1991:305) have estimated that to build a ball court required a labor investment some 14 to 60 times greater than that necessary to build a pit house. In other words, entire villages, and most probably several villages, had to be mobilized to construct ball courts. Doelle and Wallace (1991:305) have also suggested that "ballcourts can probably be viewed as indicators that a population threshold had been reached by a related set of villages."

Craft specialization has been amply demonstrated for the Tucson Basin Hohokam (e.g., Wallace and Heidke 1986; Altschul et al. 1996), but it appears to have taken place at the household or less certainly, at the village level (Altschul et al. 1996; Huntington 1986).





*Photo courtesy of Arizona State Museum*

*Examples of Pre-classic Hohokam red-on-buff pottery from Snaketown  
located on the Gila River Indian Community reservation south of Phoenix.*



Village-based craft specialization occurs in peasant communities the world over. We cannot necessarily infer centralized authority and state-level political organization simply because certain households and villages specialized in the production of goods—particularly because the distribution of many of these items seems to have been linked to cultural and religious values rather than to economy, status, and prestige. Moreover, there is little or no evidence that elites controlled the production and distribution of material goods, such as shell, as McGuire and Howard (1987) have suggested. Investigating the social correlates of craft specialization would certainly be a productive line of inquiry for future research.

The need of human groups to protect themselves and their resources is an important part of the human condition. A surge of interest in prehistoric warfare (e.g., LeBlanc 1999) has recently focused attention on this topic. We can label the spatial component of conflict as *defensive space*. It is difficult to identify and interpret the physical signatures of prehistoric conflict and defense and the modifications that result from these activities. Landscape modifications that may reflect this activity include walled and defensible sites, breastworks, and blinds.

Whereas *conflict* among social groups may be inevitable, there is little or no evidence of *warfare*—defined as “organized, purposeful group action, directed against another group that may or may not be organized for similar action, involving the actual or potential application of lethal force” (Ferguson 1984:5)—among the pre-Classic period Hohokam. Constructions such as *cerros de trincheras* have been seen as defensive structures (e.g., Stacy 1974), but these appear to date to the Classic period. Moreover, *trincheras* were used for many other functions, including habitation and possibly gardening. Wilcox and Haas (1994:230) have suggested that sparsely populated or uninhabited zones around larger Tucson Basin communities, which were located in otherwise habitable territory, can be seen as possible “no-man’s lands”—or as Wilcox and Haas define them, “administrative (political) boundaries or as buffer zones that inhibit conflict due to the transportation costs that crossing them creates.” There are, however, many other possible explanations for such zones, including functioning as a “commons” or “everyman’s” lands to which all members of a community or a region had access. Moreover, these uninhabited zones apparently developed after A.D. 1100, in the Classic period (Wilcox and Haas 1994:231). Aggregation of population into large villages can also be seen as a defensive posture (Doelle and Wallace 1991:331), but aggregated villages can be viewed as the product of simple population growth as well. Fish and Fish (1989) summarized the evidence for Hohokam warfare. As they conclude, “while violent conflict cannot be dismissed for the Hohokam, it existed at a minimal level compared with other Southwestern societies and was not elevated to a dominant preoccupation according to a Mexican template.” They also suggested that, as sedentary village farmers, the Hohokam would have had a greater stake in minimizing conflict than more mobile southwestern peoples. It can only be concluded that there is little information to speculate on conflict among the Hohokam, and that further study is needed.

As Gumerman (1991:18) has observed, the organizational forms that have been proposed for Hohokam society range a wide gamut, and the same archaeologists have proposed widely differing models. Tribal-level organization (Henderson 1987; Martin and Plog 1973; Upham and Rice 1980), segmentary tribe (Rice 1987b), chiefdom (Grady 1976; Martin and Plog 1973; Wood and McAllister 1980; Rice 1987a), the "big man" form (Wilcox and Shenk 1977), and urban state (Wood and McAllister 1984) forms of organization have all been proposed. This highlights the archaeologist's difficulty in attempting to investigate ancient social organization.

In light of this diversity, a quote from Fish and Fish (1991:168–169) is appropriate to conclude this section, for it summarizes much of what we know—or more properly, do not know—about the Hohokam.

The Hohokam stand out as particularly enigmatic among prehistoric culture groups in the Southwest. . . . Hohokam society is most clearly defined by the archaeological record at the level of households and then again at an uppermost level expressed in the distribution of communal architecture. Principles and roles generating the social fabric that connected these levels are poorly understood. . . . The Mesoamerican flavor of ritual artifacts and public architecture is particularly difficult to link with appropriate social correlates. These influences set off the Hohokam from other Southwestern traditions and undoubtedly contribute to recurring perceptions of "un-Southwestern" complexity. In spite of the undisputed Mesoamerican origin of these elements, the Hohokam incorporated them in a selective manner. . . . they did not adopt the associated Mesoamerican iconography and material items emphasizing political dominance, warfare, and human sacrifice. . . . One of the greatest challenges in Hohokam archaeology is a refined definition of organizational principles and integrative structure.

### **Settlement Patterns: Landscape Relationships**

The relational dimension of ancient landscapes allows archaeologists to look at the relationships among different landscape modifications. One way of viewing settlement patterns is to think of them as the network of relationships among different kinds of landscape modifications and the built environment. Or as Zedeño (1999) has defined it, the landscape is the web of interactions between people and landmarks. Settlement pattern is the correlation in the archaeological record of the various spatial landscape components (food-production space, ritual space, resource-procurement space, communication space, and so on). Broadly defined as land-use patterns, this topic explores how people use the physical, biological, and social environments, and the patterned relationships among components of land use and interaction.

It is possible to study the locational patterning of different kinds of sites relative to each other and to the physical and biological environments. Changes in settlement pattern through time are important data that help us to understand how Hohokam culture thrived and changed along with the vicissitudes of climate, social forces, and other factors. By plotting the overlapping or nonoverlapping spatial units that people used to carry out activities, ranging from living space to food production space, the traditional territories of prehistoric and ethnographic peoples can be defined (Zedeño 1997; Zedeño et al. 1997). This may be a more appropriate way to define the regional distribution of prehistoric cultures than by looking at material items, which of course can be exchanged.

We can speak of Hohokam settlement patterns in general terms only. Settlement patterns are best reconstructed from survey data that allow us to look at broad relationships between people and land, and there have been relatively few large-scale surveys in the Tucson area. The broad outlines of what we know need to be fleshed out with additional excavation data.

Little is known about the Pioneer period in the Tucson Basin because so few sites have been excavated. Information from Hawk's Nest indicates that farmsteads were established in areas where farming on alluvial fans was possible (Czaplicki and Ravesloot 1989a). In the Cañada del Oro phase, settlements apparently represented a series of small, independent, and widely dispersed settlements, although large villages such as the Dakota Wash settlement may have emerged as the focal points of local communities (Craig 1988). The dual, parallel occupation of upland and lowland zones that was apparently established as early as the Late Archaic period evidently continued during early Colonial times in the northern Tucson Basin (Fish et al. 1988:225). Settlements were built in the lower *bajadas* and on the terraces above the floodplains.

During the Rillito phase, individual villages increased dramatically in size (Vokes 1988, 1989), and they were evidently arranged more formally than during the preceding phase. The larger settlements, or primary villages, were intensively occupied villages that often contained ball courts and may have served as ceremonial centers. Each of these primary villages was associated with an array of smaller, satellite settlements. Doelle and Wallace (1986:93) identified five Rillito phase primary villages along the Santa Cruz River near the West Branch site. Habitations tended to be built on the first or second terraces above watercourses and on the higher portions of alluvial fans.

The settlements of Water World and Fastimes in the Avra Valley provide good examples of settlement patterning within villages and relationships among settlements. At Fastimes, structures were arranged in five separate house groups with associated features (Czaplicki et al. 1988:Figure 1.5). Ravesloot and Czaplicki (1988:304) concluded that Fastimes was a composite of small, separate farmsteads represented by house groups, and not a "village." The inhabitants were socially linked to a larger settlement. Water World, by contrast, was a different type of settlement. Twenty-one pit houses and many extramural features were investigated. Seven house groups, which were less discrete than those at Fastimes, an open

plaza area, and a ball court were arranged over the site area (Czaplicki et al. 1989). Raveslout and Czaplicki (1989:306) concluded that Water World was "a formalized village that was permanently occupied for a relatively short time." It is tempting to speculate that the farmsteads at Fastimes were linked to this village.

Using the distribution of diagnostic pottery types and density of refuse accumulation, Doelle and Wallace (1991:301) have shown that occupation in the Tucson Basin appears to have been most intense during the Colonial and early Sedentary periods. Not only was occupation at the larger sites continuous, but the population was growing. The mechanisms that promoted population growth remain poorly understood, however. There may have been improved conditions for floodwater farming in some parts of the basin (Waters 1987). New corn varieties were introduced at this time (Cutler and Blake 1976), possibly increasing productivity and yields. Many factors may have been at play.

The beginning of the Rincon phase was marked by changes in site locations and frequencies that may have been correlated with minor environmental fluctuations, such as changes in the floodplain environment along the Santa Cruz River. There evidently was residential expansion in the eastern Tucson Basin. Settlements increased in number, upland elevations were settled, and agriculturally marginal areas began to be farmed (Elson 1986:446-447; Simpson and Wells 1983, 1984). In the western Tucson Basin, dispersed settlements appear to have replaced large, centralized villages and associated hamlets (Doelle 1988:283).

The dispersion of settlement across the land, apparent population growth, subsistence diversification, and changes in settlement organization may all be related to the favorable climate of the Sedentary period, which would have made floodwater farming possible in many previously marginal areas (Graybill 1989; Rose 1994; Van West and Altschul 1994). Dendroclimatological reconstructions for the Salt, Gila, and Verde Rivers (Graybill 1989; Rose 1994) indicate that the Sedentary period as a whole was relatively favorable for agriculture, although highly variable. The years between A.D. 1070 and 1100, when the expansion of population in the Tucson Basin seems to have taken place, were particularly moist (Rose 1994:357).

West Branch was one of the largest settlements dating to this time. Current information indicates that the settlement was founded and increased in size rapidly, and was occupied for a relatively short period of time. This explosive growth may also be related to good conditions for farming, particularly at West Branch. The confluence of the West Branch and main branch of the Santa Cruz River would have created a large expanse of well-watered floodplain with abundant arable land (Altschul et al. 1996). These large villages were comparatively rare during the Rincon phase, however; smaller and medium-sized hamlets were much more common. Many of the small settlements appear to have been specialized locales for procurement of different resources, and are located in parts of the basin and its adjacent areas not well suited either to farming or to long-term habitation (Ferg et al. 1984; Huckell et al. 1987).

The possibility that long-term villages were special places linked to the land and to the ancestors, and which served as ceremonial locales and mortuary centers, deserves further study. Snaketown is perhaps the best example of such a settlement. Occupied continuously for centuries, the village was huge and complex, containing cremation cemeteries and numerous ceremonial structures as well as domestic habitations. Similar villages may have been located in the Tucson Basin. The Hodges Ruin (Layhe 1986; Kelly et al. 1978), located near the Rillito and Santa Cruz River confluence, may have been once such village. Such places may have served as regional centers, the focus of social and ceremonial activities for a large group of people. The importance of ties to the land and to the ancestors among the Hohokam implies that such regional centers may have served as centralized mortuary facilities where the dead were brought to be buried with generations of ancestors. The disparity between the number of habitations and the number of cremations at many Tucson Basin sites (Whittlesey et al. 1994:147) as well as the relatively small number of large villages suggest such a possibility. Certainly large villages in the Tucson area were, like Snaketown, often occupied for multiple generations (Doelle and Wallace 1991:298).

All of the varied kinds of locales of habitation and activity were linked together in a coherent and functioning system of daily life. "Community" is a term archaeologists often use when speaking of the contemporaneous settlements that were part of a functioning whole. The productive potential inherent in the environment is naturally segmented by human populations, but these productive units seldom conform in the archaeological context to single sites or even groups of sites. As Fish and Fish (1990:163) have written, the productive unit replicated across the landscape is a community of economically interdependent settlements, whose identity and integration is symbolized by shared participation in public functions associated with ball courts and platform mounds at a central settlement.

No doubt this was true throughout the Tucson Basin, although because survey coverage is limited, and it is sometimes difficult to date surface remains, we cannot paint the picture in its entirety. The northern Tucson Basin offers good examples of community relationships and the landscape whole. Research has defined two pre-Classic period communities of equivalent scale in this area. One was on the flank of the Tortolita Mountains and the second along the Santa Cruz River at the northern end of the Tucson Mountains. Both incorporated permanent sources of water, diverse locations for productive activities, a range of site types reflecting these activities, and focal sites with ball courts (Fish and Fish 1990:167). Each community was surrounded by areas lacking substantial habitation sites and with sparse distributions of other types of sites. These communities can be described as ecosystems and as "independently integrated territorial units" (Fish and Fish 1990:167).

Such communities no doubt were broadly distributed across the Tucson Basin and its environs. It seems likely that there was always a dual settlement system in the Tucson area, one based on the primary and secondary watercourses—a riverine system—and one on the higher *bajada* slopes in the mountain foothills—a *bajada* system. In addition to the communities defined by Fish and Fish (1990) in the northern Tucson Basin, other nonriverine communities have been

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defined in the southern Tucson Basin (Dart 1987) and on the slopes of the Picacho Mountains (Ciolek-Torrello and Wilcox 1988). Fish (1996:113) describes some of the likely social attributes of these communities. A variety of agricultural technologies were used rather than shared canal systems only. Therefore, instead of a single users' organization linked to use of the same canal system, these communities can be viewed as contiguous sets of users' associations, each cooperating for agricultural purposes." There was a need, however, for cooperative activity and consensual land and water allocation, at least within individual community territories.

Trails would have linked the activity areas and resource procurement locales, farmsteads, hamlets, and villages within each community as well as the major villages of different communities. A network of other trails no doubt would have moved people and commodities between the Tucson area and other parts of the Hohokam world. Few traces of these trails have survived over time, however.

The relatively even spacing of ball court villages, those that Doelle (1988) labels primary villages, the "empty" or sparsely settled space between communities, and the presence of public architecture at many different settlements indicate that Hohokam communities in the Tucson Basin were not hierarchically arranged and had definite territorial boundaries. They seem to have been distributed at fairly regular intervals, as well (Doelle et al. 1987). The spatial distribution of communities mirrors the spatial organization of houses within courtyard groups and house clusters and precincts within villages. That is, all were aggregates of similar units (Whittlesey et al. 1994:182).

The available information suggests certain patterns in Hohokam settlement. First, there was a broad dichotomy between large villages of more permanent habitation and the shorter-term field camps used for specialized procurement and processing (Miksicek 1988:52). The location of the latter camps, in *bajada* and higher-elevation zones with little agricultural potential, also suggests a special function (Huckell et al. 1987). Second, the special-purpose zones and the habitation areas were not widely separated. Instead, the territories used for resource procurement, food production (farming), and habitation all seem to have overlapped, although there was a tendency to build villages in certain areas and locate special-use camps in others. Third, the spacing of communities was more or less regular, and each community seems to have embraced a zonal patterning, distributing its contemporaneously used settlements among different environmental zones. Fourth, settlement was centered on large ball court villages, some of which may have served as special places or ancestral sites for a large population. Last, Hohokam settlement in the Tucson Basin was repetitive rather than hierarchical, placing dispersed but highly similar settlements alongside one another, often in somewhat different environmental settings.



### **Summary: The Pre-Classic Hohokam Landscape of the Tucson Basin**

Who were the Hohokam of the Tucson Basin? This concluding section attempts to answer this question by looking at the ancient Hohokam cultural landscape and the multiple facets of culture, ritual, identity, values, and belief that it reflects. The many interconnections among components of the ancient Hohokam landscape are particularly important, for it is the repetitive patterning among elements that helps to reveal the less tangible aspects of culture (Whittlesey 1998a).

### **Origins and Identity**

The Hohokam were people of the Sonoran Desert, first and foremost. The desert was their source of sustenance and support, and the Hohokam's mastery over this harsh environment engendered a close symbiotic relationship. Hohokam culture in its "purest" form—that is, with all of its material trappings, full complement of ritual and ceremonial structures, and domestic organization—is found only within the boundaries of the Sonoran Desert (Haury 1976). But because mastery of the desert depended on control of water, the Hohokam were paradoxically also people of water. As master farmers who used river and rainfall to make the desert bloom, it was water that pervaded Hohokam iconography and symbolism and that focused at least some of their ritual performances. Marine shell; birds and animals associated with rivers; figurines made of water-deposited clay; and the shiny surfaces of pottery, mirrors, and schist palettes all represent symbols associated with water.

The likely origin of the Hohokam in Mesoamerica—or minimally, the close relationship of the Hohokam to Mesoamerican cultures—is reflected in multiple aspects of symbol and iconography, in material culture and ritual, in ceremonial structures, and in practical knowledge. Directional, elemental, and color symbolism (south, water, and red) may certainly reflect this place of origin, although this is entirely speculative.

Archaeological sites are an important component of the landscape in many traditional cultures and serve to connect people with their history. As Lowenthal (1985:247–248) has expressed it, because "Yesterday's relics. . . enlarge today's landscapes," any "past lacking tangible relics seems too tenuous to be credible." Lowenthal catalogs some of the many functions that relics of the past serve for living peoples. In the Southwest, Anasazi ruins are intimately woven into the fabric of Navajo life. They serve as a concrete example of what happens to a people when they lose a sense of the sacred and disregard the teachings of religion and culture. Sites tell a tale of a "gifted people gone astray. The lessons from their existence are retold time and again in the stories and songs that teach of the ruins that dot the landscape. Indeed, the sites and artifacts serve as mnemonic devices to warn the knowledgeable that the sins of the past are still a threat to those living in the present" (McPherson 1992:95). Many sites have specific names and are associated with folklore and oral history; they are woven into the songs and stories that are the core of ceremonial practice (McPherson 1992:83).

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The Western Apache also had a close relationship with the prehistoric Mogollon sites of their mountain landscape, although it was typically more prosaic than with the encoded landscape lessons of the Navajo. The Western Apache often camped at sites and exploited them as a resource, recycling artifacts such as ground stone tools, ceramics, turquoise, and shell (Whittlesey and Benaron 1998).

Perhaps the best example of a relationship between a living people and a vanished culture who may or may not have an ancestral connection is expressed in the oral history of the O'odham peoples. The Akimel O'odham creation myth expresses a close but indeterminate connection between the living O'odham and the vanished Hohokam. As Bahr et al. (1994:1-2) have written, "the Pimas were both the same as and different from the Hohokam: they were the same because they spoke the same language (there are many songs in the text that are considered to retain Hohokam language verbatim), and they were different because the text says that they conquered and 'finished' the other people. ['Hohokam' meaning 'finished ones' in Pima]. The conclusion to draw from this, if both ideas are accepted, is that the Hohokam conquest was . . . something like a civil war." There are many lessons encoded in the text of the Hohokam chronicles about proper behavior, values, and morals and the consequences that ensue when these are disregarded. Casa Grande, the Classic period great house on the Gila River, figures prominently in these stories (Bahr et al. 1994).

We do not know how the Hohokam of the Tucson Basin may have viewed the abandoned sites of those who had come before them—the people of the Archaic and the Early Formative periods. It is probable that, as a people who appear to have been deeply concerned with their ancestors, the Hohokam marked such sites as important places on the landscape and associated them with important events in their history, cosmology, and mythology. As with many past and present peoples, relics, monuments, and sites are often bound up with a sense of national or cultural identity (Lowenthal 1985:248-249). Beyond that, we cannot know. The moral and ethical lessons such sites may have held remain hidden from our understanding.

### **The Social Landscape**

The social landscape, particularly the relations of kinship and family, are reflected intimately in the built environment. The Hohokam evidently emphasized the family and larger descent groups, such as lineages and clans. This is mirrored in their dwellings, the organization of their villages, and in their ritual performances and paraphernalia. Social organization seems to have been nonhierarchical, or at least horizontally arranged. That is, instead of hierarchical ordering of levels or tiers, there was a repetitive patterning of equivalent units. This is seen in house clusters, the organization of villages, in community patterning, and in the regional landscape as a whole. House clusters were accretions of similar houses, villages were accretions of house clusters, communities were similar-sized and equally spaced agglomerations of settlements, and the regional landscape was patterned with dispersed, equivalent communities.

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The organization of villages, communities, and possibly the region as a whole was zonal or concentric. There were zones within larger villages that served as public and ceremonial areas and others that were used primarily for habitation. Communities were arranged in a similar fashion, with certain areas, often corresponding to environmental zones, used for resource procurement, farming, and habitation. The entire region may have been organized in a similar concentric arrangement. Activities in communities and the region may have been arranged according to these divisions and to corresponding landscape features, perhaps by gender or other social considerations, much the same as the Pueblo peoples of the historical period organized their landscape and its uses.

As Jackson (1995) has described it, there were three concentric zones around the Pueblo village. The outermost zone was the mountain and forest region, which because of its remoteness and physical danger was the exclusive province of men. Next was the zone of foothills and valleys where men and women went to collect plants, animals, and stone resources and to hunt small game. Ortiz (1969) called this the zone of flat-topped hills, and it was sacred territory beyond which it was thought that women and children should not venture. Last and innermost was the zone of irrigated fields and gardens, the streams that watered them, and the grass and trees of the valley through which the streams ran. The fourth zone at the center of the landscape was the pueblo village itself. Although largely fictitious in its concentric structure, this organizing landscape principle structured activities and reflected the cosmological concepts of directions and worlds emphasizing the number four.

A similar arrangement among the Hohokam communities of the Tucson Basin may have reflected the Mesoamerican-derived concepts of upperworld, middleworld, and underworld or another kind of cosmological organization. The village and its farmlands were innermost; the outer zone would represent the *bajada* environment that provided so many useful resources. The farthest zone would have stretched beyond the Tucson Basin to meet with other regions, including the mountain ranges that separate the basins of southern Arizona. "Ownership" of these zones and resources is even more intangible, but it can be imagined that the village and its lands were privately owned by family and larger descent groups, such as lineages or clans, as at Hopi (Bradfield 1971; Levy 1992). The *bajada* zone may have been viewed as a commons to which everyone had access.

The nonhierarchical, replicated-unit character of this pervasive organizing principle implies that Hohokam social organization was also nonhierarchically organized. There is little material or architectural evidence of status or prestige differences. Such differences in household wealth that existed may be attributed to the developmental cycle of domestic groups, with the largest and wealthiest households also being the oldest and those with the most members. Whether this apparent egalitarian organization was fictive or real is an important arena for further study. McGuire (1992) has discussed Hohokam mortuary ritual in terms of some of the possible contradictions revealed by mortuary and architectural data and the ability of mortuary ritual to negotiate tensions in the social order. He has observed that, although the message conveyed by Hohokam architecture was a denial of inequalities in the social order, another

aspect of their social structure, the mortuary ritual, was distinguished by material culture differences and by conspicuous destruction of goods. He has suggested (McGuire 1992:205–206) that “the egalitarian ideology of everyday life was produced and legitimated in a seemingly contradictory mortuary ritual. . . . The inequalities in the social order were ritually revealed in the assemblage of items. Then the destruction of the items would deny the permanence of such inequalities, and seemingly limit accumulation across generations.”

### **Ritual and the Sacred Landscape**

Knowledge about the environment, appropriate procedures for using its resources, and conservation techniques are deeply embedded in cultural values and ritual in most traditional cultures. It is difficult, therefore, to separate “economic” activities from “ritual” activities, and this is one factor that makes the landscape model so appropriate. In ritual and the sacred landscape can be seen many of the organizing principles of Hohokam culture, ideology, and social organization. The sacred landscape and its built components and landscape modifications reflected important structural and cosmological concepts. Directional, color, and elemental symbolism pervaded Hohokam ritual performances and paraphernalia. The importance of kinship and the ancestors, land tenure, fertility of the land and people, and abundant water are themes that saturate iconography and ritual items. Caches of figurines and other ritually destroyed items appear to reflect ancestor veneration and the importance of descent groups, as well as playing an important role as offerings to increase fertility and ensure abundant water.

The importance of water cannot be overstated. Farmers dependent on irrigation water did not need to propitiate the gods for abundant rainfall, but construction of irrigation features, allocation of water, and maintenance of irrigation ditches may have been closely tied to ritual activities. Techniques and structures for water control were necessary, not only to provide water for growing crops, maximize water use, and reduce overflow, but also to prevent fields and ditches from washing out and reduce soil erosion (Fish and Nabhan 1991; Ford 1999). We cannot know the particulars of symbolic meaning in Hohokam iconography, but water symbolism was an integral part of ceramic decoration, stone work, and shell work.

Rituals may therefore have been conducted at important milestones in the life of an irrigation feature, and priests or other religious functionaries may have had a role in allocating water and scheduling irrigation. Hints of such activities are embedded in the O’odham creation stories. In the story called “The Origin of Irrigation” (Bahr et al. 1994:124), the people noticed a decrease in the rain and began to build a canal. When the canal was completed, water would not flow through it, and the people asked several medicine men to try and make the water flow. The first and weaker medicine men failed; the last and most magically potent medicine man succeeded.

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Bahr et al. (1994:131–132) have presented the text of songs that are interesting for possible connections to the role of ritual in ensuring water flow. The failed medicine man sang (Bahr et al. 1994:131):

There lie the ditches  
And among them  
I am walking  
And among them I am breathing,  
Leading the water.

The second medicine man sang another song (Bahr et al. 1994:132):

There lie the ditches  
And I stood in the midst,  
I'm making the winds blow (dust devils)  
I'm making the water go.

The last medicine man pulled a hair from his head, put it in the water, and it moved. He sang (Bahr et al. 1994:132):

There lie the canals  
And in the midst of those  
I stand  
Making water-hair snakes.

Empathetic magic (breathing and wind, hair and water snakes) seem to be part of these magical rites. Among the Hohokam, ritual may have been incorporated into construction phases, ensuring the successful engineering required to build a useable canal, as Bahr et al. (1994) have described in the O'odham stories. Ritual may also have had a central role in water allocation as described by Lansing (1991) for the water temples of Bali.

For floodwater farmers, the unpredictable nature of the summer monsoons inserted an element of risk that the more dependable irrigation farming lacked. Although the onset of the summer monsoon is usually predictable (McDonald 1956), summer rain typically falls in storms of restricted area and rapid delivery—thunderstorms may drop vast quantities of water on one small area within a short period of time, leaving other areas untouched (Sellers et al. 1985; Turnage and Mallory 1941). Moreover, runoff events of sufficient magnitude to water crops can often fail periodically (Nabhan 1983). We can imagine, therefore, that control and prediction of summer rainfall was an important component of Hohokam ritual systems, at least in the Tucson Basin. In addition, the rapidity of runoff required coordination of effort to use it wisely, direct it to the fields, and prevent erosion. As Fish and Nabhan (1991:38) have written, "the timely presence of farmers for adjustment would be most critical where summer rainfall was a central factor in annual food production."





*Photo courtesy of Arizona State Museum*

*Hohokam ram effigy vessel from the Hodges Ruin near the confluence of the Rillito and Santa Cruz rivers.*



Among groups who depend solely on rainfall to water their crops, such as the Hopi, ritual is concentrated toward bringing rainfall and secondarily on fertility. As Ford (1999:79) writes of the Zuni people, "The essence of Zuni ceremonialism is the bringing of water—rains and snow." Sodalities (nonkinship-based organizations) existed for this purpose at Hopi, Zuni, and elsewhere in the Pueblo world. Among the Tohono O'odham, the saguaro wine ceremony was devoted to the purpose of bringing rain (Underhill 1946). Emulative magic—simulating rain clouds through clouds of tobacco smoke, for example—is often part of rain-making ceremonies and a variety of symbols is used to represent rain, clouds, and lightning. Bringing of rain was probably an essential element of many ceremonies. This was no doubt extremely critical to the Hohokam of the Tucson area, for as we have seen they were much less dependent on irrigation farming than their neighbors to the north in the Phoenix Basin.

At Zuni, many sodalities have special rituals and restricted knowledge related to the procurement of plants used in ceremonies (Ford 1999:74). We can imagine that there was similar knowledge and rituals among the Hohokam, focused on important economic and medicinal plants. Importantly, in traditional societies, the rituals and procedures involving the respectful use of resources, whether mineral, plant or animal, often creates an embedded conservation ethic. By using them in an appropriate and respectful manner, the people ensure that the plants will remain to be used for many years (e.g., Ford 1999).

### **The Modified Hohokam Environment**

An informed appraisal of the relationship between the Hohokam and their environment does not view them as vulnerable to the vicissitudes of their harsh climatic regime, but as capable managers of the environment and its resources (Fish 1984). They can be viewed as "resourceful and dynamic environmental engineers who successfully underwrote a recognizable cultural tradition over hundreds of years" (Fish 1988:31). The Hohokam transformed their environment, manipulating it in conscious ways to achieve specific outcomes. We must be alert, however, to the mutual interaction of people and environment. In the process of managing their environment and deriving sustenance and support from it, the Hohokam also changed it, perhaps in irrevocable ways, which in turn affected the Hohokam profoundly.

"Prehistoric farmers in southern Arizona undoubtedly did have a major impact on their local environment," Miksicek (1988:47) wrote. A variety of human activities had consequences for the environment, from minor and often beneficial changes to dramatic shifts with severe consequences for human occupation. Among these activities were farming, particularly clearing land for agriculture through woodcutting and perhaps burning desert land, digging irrigation canals, artificially creating field areas, and manipulating plant species; habitation, including trampling areas around habitations, depositing trash middens, and collecting firewood; and miscellaneous activities, such as creating and using trails.

Farming was likely a primary factor in the most intensive and far-reaching modifications of the Hohokam landscape (Fish and Nabhan 1991:44). Over time, farming methods may change the agricultural landscape entirely and create new field areas requiring different techniques. Ford (1999:78) describes such a progression among Zuni fields. A field planted at the mouth of an arroyo—the *ak-chin* technique used by O'odham and presumably also Hohokam farmers—is watered by a floodwater technique used to lift water over the bank to the field. The dam used for this purpose creates an accumulation of sediment behind it. As the arroyo fills in, the slope decreases and embankments to control runoff may be all that is necessary to water the field. Eventually, a level field is created and only rain falling on the field from above will be directed to plants. Similar progressions no doubt affected the location of Hohokam fields and the techniques used to water them.

In clearing land, planting fields, and tending them, the Hohokam changed the local environment in sometimes drastic ways. Unwanted plants were removed, and other plants favoring disturbed habitats were tolerated, changing the plant distributions within fields (Bohrer 1970; Gasser 1982; Fish 1984, 1985; Miksicek 1984, 1988). Removal of mesquite and other trees in floodplains would have changed species compositions of the riparian corridors drastically. Canals, where they were used in the Tucson area, carried a load of silt as well as water to Hohokam fields. That these activities altered the chemical and physical properties of soils in Hohokam fields is certainly likely. Seepage from irrigation ditches would have favored growth of many plants, including mesquite (Fish and Nabhan 1991:46). Some archaeologists have suggested that the Hohokam used fire to clear agricultural land (Bohrer 1971; Miksicek 1984). Bohrer (1991:233), for example, has written that "large tracts of desert were burned to promote the grasses and cool season herbs so important to Hohokam economy."

There were several unintended consequences of these practices. Clearing of land for agricultural fields and village construction altered the preferred habitat of rabbits. Cottontails hide from predators and prefer dense ground cover, whereas jackrabbits flee from predators and inhabit open spaces with little vegetation (Szuter 1988:40). These preferences when coupled with proportions of jackrabbits and cottontails in archaeological faunal assemblages have been used by archaeologists to model the density of ground cover (Bayham and Hatch 1984). The altered species composition provided a ready source of protein for Hohokam farmers and may indeed have been a conscious objective of land modifications (Szuter 1988:40). Moreover, organized hunting of field rodents was not necessary. Small game could be taken by women and children as they tended the fields (Szuter 1991:284).

There was direct manipulation, even semidomestication, of a number of "wild" resources. Through selective planting and tending of resource plots, the natural distribution of vegetation and the genetic characteristics of the manipulated crops were altered. Such crops included little barley (Adams 1987; Bohrer 1984), chenopods (Gasser and Miksicek 1985), amaranth (Fish and Nabhan 1991:46), and cholla (Fish 1984; Fish and Nabhan 1991:46). Agave, of course, was the most ubiquitously cultivated "wild" plant; rock-pile fields devoted to its cultivation were one of the most obvious modifications of the agricultural landscape.

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Changes in the floodplain environment along the Santa Cruz River have been implicated in shifting Hohokam settlement patterns. Waters (1987), for example, has argued that cycles of downcutting and aggradation along the river would have alternately created conditions that were suitable for floodwater farming and conditions that mitigated against it. Shifting settlement locations along the river through time have been linked to these changes in hydrologic regime (Doelle 1988; Doelle and Wallace 1991; Effland and Rankin 1988). Miksicek (1988:47) has noted the probable effects of deforestation on water regimes: "Ancient farmers probably cut down large stands of riparian gallery forest and mesquite *bosque* for fuel, timber, and farmland.

Altering these streamside plant communities most likely changed local hydrological conditions and would have contributed to increased bank erosion and overflow during peak flood events." It is unclear to what extent human manipulation of water through construction of ditches, dams, and reservoirs may have contributed to changes in the river's flow and course. Small constructions may have had a cumulative effect through time. This is an area where additional work is needed.

Habitation activities also affected the land in many ways. In simply living on the earth's surface, the Hohokam affected its character. The village was crucial to survival in the desert environment, as Doelle and Wallace (1991:295) have pointed out. Cooperative labor was needed for farming, resource procurement, construction of ceremonial structures, possible defense, and much more. But the long-term occupation of Hohokam villages no doubt affected the environment markedly, contributed to its degradation, and may have prompted residential mobility.

These effects were multiplied because many large villages were occupied for long periods, even over many generations. Depletion of fuelwood and wood for construction is a logical outcome of dense and long-term habitation. Changing proportions of jackrabbits and cottontails in archaeological faunal assemblages may reflect the reduced ground cover associated with long-term occupation. The proportion of jackrabbits in faunal assemblages increases with the length of site occupation (Szuter 1988:40). Depletion of fuelwood as well as possible decreased soil fertility with long-term cultivation may have been two reasons for the shifting locations of Hohokam villages.

In conclusion, the mixed Hohokam subsistence strategy and the diverse technologies they developed to farm the desert served multiple purposes in Hohokam life. The seasonal and locational risks of desert farming were countered on several levels. It is likely that Hohokam farmers in the Tucson basin divided their efforts among several technologies categories of water management. "To the degree that localized failures were mediated by the circulation of harvest throughout the community, the inclusion of multiple technologies and differential risks enhanced the subsistence success of the community as a whole," as Fish (1995:107) has written.

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The Hohokam appear to have "maintained a flexible and varied economy, manipulating their arid environment to increase a multiplicity of products inherent in regional vegetation. This was in addition to long term competence in achieving supplies of corn, beans, and squash" (Fish 1988:31). By incorporating a variety of nutritionally dense wild plant foods into their diet, the Hohokam also avoided the nutritional deficiencies and associated pathologies that develop with corn-dependent diets (El-Najjar et al. 1975; Fink and Merbs 1991; Ivanhoe 1985).

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