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The Hohokam Archaeology of the Phoenix Basin

Douglas B. Craig, Northland Research, Inc.

WHAT USUALLY COMES TO MIND when people think of Southwestern archaeology are images of pueblo ruins rising above windswept mesas and cliff dwellings tucked away in remote, steep-sided canyons. Increasingly, though, much of the archaeological work that takes place in the American Southwest is carried out in urban settings—downtown areas undergoing urban renewal, vacant lots and abandoned fields where housing developments and shopping malls are being built, and alongside roads and highways being upgraded to handle more people commuting longer distances. Nowhere is the new look of Southwestern archaeology on display more prominently than in the Phoenix Basin of central Arizona, one of the fastest-growing metropolitan areas in the United States

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Phoenix Basin Hohokam irrigation systems were impressive accomplishments. Two canals are still visible on the ground surface just east of the north runway of Sky Harbor International Airport in Phoenix. These canals appear as subtle linear depressions bounded by linear mounds of soil in the center foreground of this image. Many canals have been documented beneath the airport.

This issue of *Archaeology Southwest* provides a sample of recent archaeological research on the Hohokam in the Phoenix Basin. Between A.D. 500 and 1450, Hohokam people living there built and maintained a vast network of canals that irrigated tens of thousands of acres along the lower Salt and middle Gila rivers, the primary sources of water for the region. Most of the population lived in farming villages spaced at regular two- to three-mile intervals along canal systems. The largest villages may have contained 1,000 to 2,000 people at their peak, but most were probably in the 200- to 400-person range. Approximately two dozen separate Hohokam canal systems have been discovered in the Phoenix Basin to date, a dozen along the middle Gila River and another dozen or so along the lower Salt River. Each of these canal systems had its own intake and set of primary and secondary canals to transport water to fields. The largest canals were about 75 feet wide at the top, 50 feet wide at the bottom, and more than 20 miles in length—impressive even by modern standards. Additionally, multiple villages were often linked together along a single main canal, implying that they shared water rights and functioned at some level as a single social and political unit.

Massive irrigation works are only part of the story of Phoenix's past. Large quantities of craft items—such as pottery, stone tools, shell jewelry, and cotton textiles—were produced by the Hohokam and subsequently traded to outlying regions. Ballcourts and platform

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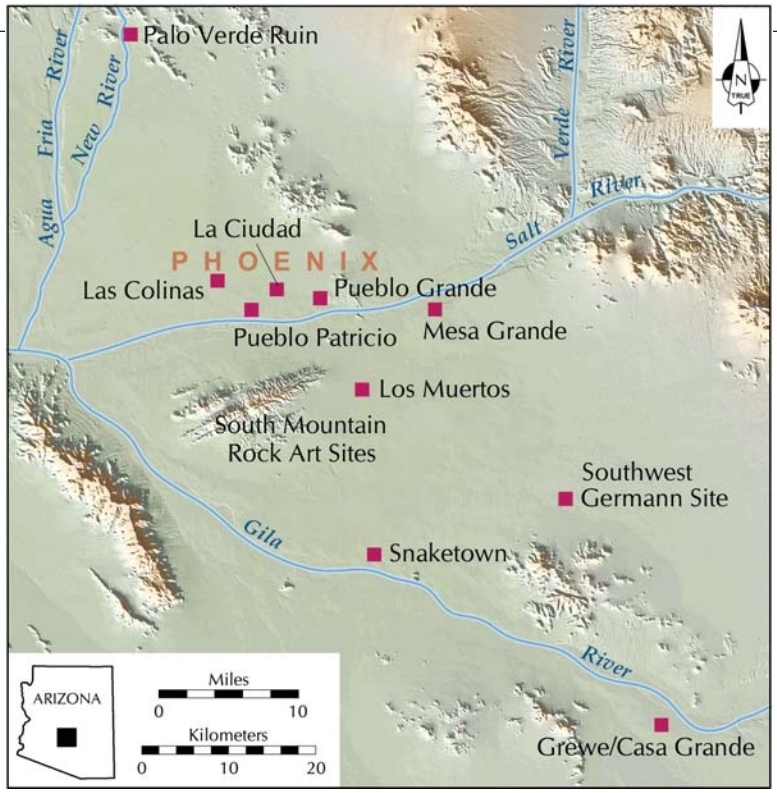
mounds, the two principal forms of Hohokam public architecture, were also common throughout the Phoenix Basin. In fact, roughly one-third of all known ballcourts and half the platform mounds in the Hohokam region were in the Phoenix Basin. Sadly, most traces of these and other surface features are no longer visible. Over the past century, these traces have either been plowed under or covered over as Phoenix has grown from a small, Western farming town to a booming metropolis. Fortunately, a wealth of information is still preserved beneath the layers of dirt and asphalt.



Map showing sites discussed in this issue of Archaeology Southwest.

The articles that follow are presented in loose chronological order. Mark Hackbarth begins the issue with a report on recent excavations at a site in downtown Phoenix called Pueblo Patricio. The significance of this work goes beyond the early dates (A.D. 1–450) reported for some of the houses and other features. Also found was evidence for a gradual increase in the duration and intensity of occupation at the site, a settlement pattern consistent with increased sedentism.

The next four articles report on research involving the time period from A.D. 500 to 1100, known as the pre-Classic. David Abbott begins by discussing the role of ballcourts in providing a foundation for regional exchange and integration. Next, Henry Wallace reports on his efforts to develop a more fine-grained chronology for the pre-Classic by tracking changes in decorated design styles on buff ware pottery produced in the middle Gila River Valley. My article focuses on households at the Grewe site and the relationship between residential stability and household wealth. Finally, Kathy Henderson offers a photo-essay on very large pithouses at the western margin of the Phoenix Basin.

For many years, archaeologists thought the Hohokam were simple desert farmers guided by egalitarian ideals and ruled by consensus. The articles by Jerry Howard, Kyle Woodson, and Michael Droz and his colleagues paint a very different picture of what it took to operate and maintain Hohokam canal systems. Both Howard and Woodson combine ethnographic and archaeological evidence to show that considerable managerial and organizational skills were required to keep the canals up and running. Droz and colleagues illustrate another side of current canal research, focusing on the study of canal sediments.

Then, four articles bridge the gap between prehistory and history. Banks Leonard reports on recent excavations at the Southwest Germann site, a late pre-Classic (A.D. 900–1100) and Classic period (A.D. 1100–1450) settlement situated along Queen Creek in the central Phoenix Basin. To take advantage of highly variable surface water conditions along Queen Creek, Hohokam farmers regularly moved their settlements short distances to be closer to fields. This pattern of "village drift" provides a useful contrast to the "deep sedentism" seen at large irrigation communities along the lower Salt and middle Gila rivers.

Many Hohokam villages in the Phoenix Basin experienced a sharp decline in population during the late Classic period (A.D. 1350–1450). Brett Hill explores some of the key factors that likely contributed to this decline. Drawing on a combination of archaeological data and O'odham oral history, Hill explains how the interplay between social and environmental factors must be considered to understand the Hohokam collapse.

O'odham oral history also plays a prominent role in the article about ancient trails by Andrew Darling and Barnaby Lewis. One of the ways that the O'odham pass down knowledge about traditional landscapes is through the repeated performance of songs. Archaeologists have found that these song traditions provide important clues about previous travel routes and belief systems. Also linking past and present belief systems, the article by Aaron Wright, Steve Swanson, and Todd Bostwick reports on efforts to preserve and study the rock art in Phoenix's South Mountain Park. Their article also illustrates some of the creative approaches to site preservation that are being adopted in the Phoenix area. Finally, William Doelle considers long-term cycles of change in Tucson and Phoenix.

Phoenix Rising: The Phoenix Convention Center

Mark Hackbarth, Logan Simpson Design, Inc.

When the original Phoenix Town Site—one mile long and a half-mile wide—was laid out in 1870, probably no one thought to ask how the Hohokam might have used the area in earlier times. Some 125 years later, archaeologists had to sift through a complex recent history to answer that question and others. In September 2006, in preparation for construction of the Phoenix Convention Center, the most recent layer of Phoenix's past was removed from an 8.4-acre project area during the demolition of the Phoenix Civic Plaza's North Hall. The eastern half of the North Hall extended over two city blocks; it was constructed in 1972 on a six-foot-high pedestal of fill that sealed prehistoric and historic archaeological resources in place. In contrast, the western half was an underground parking garage that had largely destroyed any archaeological remains.

The remaining intact city blocks revealed a foundation, brick-lined well, and steam power plant from the first ice factory constructed in Phoenix, in 1879. Other historic features in the project area consisted of domestic structure foundations, privies, and a brick-lined well next to a private residence that was built before 1893.

Scott Plumlee

The diversity of architectural types, like this pithouse, suggests that the Red Mountain phase settlement pattern was more complex than previously recognized.

At slightly deeper levels that were only lightly damaged by the pre-1900 use of the area were intact layers of the Hohokam site named Pueblo Patricio. We found evidence of an initial occupation during the Red Mountain phase (A.D. 1–450). Occupation continued through the early Pioneer period (A.D. 450–650), and on through the late Colonial period (A.D. 850–950), followed by a hiatus in the occupation that ended with a Classic period (A.D. 1150–1350) reoccupation.

The Red Mountain phase was initially described by Donald Morris in 1969 as a local Salt River variant, or branch, of the early Pioneer period Hohokam tradition originally identified along the Gila River at Snaketown. A lack of absolute dates left the relationship of this newly defined phase to the Gila River materials unresolved. Discoveries at Pueblo Patricio in 1985 by John Cable and others were used to refine the characteristics associated with the phase, and also provided preliminary dates. Red Mountain phase structures excavated in 1985 at Pueblo Patricio had a floor size greater than 170 square feet and a square plan view with rounded corners, a plastered hearth and floor, and an irregular posthole pattern. Associated artifacts included plain ware ceramics (but not red wares), small laterally notched dart points similar to San Pedro points, and trough and basin metates with manos. In 1995, Henderson completed additional work at Pueblo Patricio that revealed 15 Red Mountain phase structures that were small (less than 160 square feet) and ephemeral, and that lacked subfloor features other than an occasional hearth.

Forty-six prehistoric architectural features were identified in the current project area. Minimally, nine are Red Mountain phase structures; one flexed burial further substantiates the presence of a Red Mountain phase occupation. One sub-square structure found in the project area was typical of those previously documented. Somewhat surprising was the wide variety of other house shapes and sizes we encountered that dated to the Red Mountain phase. This diversity of house types from the project area may be related to its location near the topographic transition from the slightly higher first terrace to the lower level of the Salt River floodplain. Prehistoric populations probably used the different landforms for unequal lengths of time. Red Mountain phase houses on the higher landform in the project area were more diverse in terms of size, construction quality, and shape, indicating longer residential stays. The lower landform generally had small, ephemeral structures that were more likely fieldhouses used seasonally.

The Ballcourt Village of Palo Verde Ruin

David R. Abbott, Arizona State University

AT THE CENTER of the Hohokam regional system were the densely populated and irrigated lands of the lower Salt and middle Gila river valleys, which were surrounded by environmentally diverse and resource-rich uplands to the north, east, and south, and by desert lowlands to the west. This vast regional territory was inhabited by geographically separate but interacting communities that were dependent on one another through the exchange of goods and services. Probably the foundation for the region's integration was a dense network of ballcourts.

By A.D. 800, ballcourts were becoming an essential element of every Hohokam village. This ballcourt at Pueblo Grande was excavated and reconstructed.

The largest of these oval features was about 200 feet long and 100 feet wide, with prepared, flat floors and sidewalls that continued up onto the surrounding embankments, which stood about eight feet high.

In 1937, archaeologist Emil Haury was the first to propose that these earthen constructions were ballcourts, where a ceremonial ballgame was played similar to ones observed in Mexico by Spanish conquistadors. The presence of ballcourts throughout southern and central Arizona implied a shared set of ritual beliefs across the region, which provided a basis for social and economic interaction. At last count, 238 ballcourts at 194 sites have been identified.

As many as 500 spectators could have been seated on the embankments of the largest courts to watch the game below. Apparently, such crowds were drawn to the festivities from near and far, providing an ideal venue for barter and exchange. Two competing models have been proposed to describe the ceremonial and exchange relationships.

The first model views the ballgame-related transactions as part of the social arrangements and ritual responsibilities controlled by local "big men." People's obligations to produce goods and services for ceremonies created periodic pools of gifts that, when amassed by local leaders and carried to ballcourt events in a continuing series of reciprocal exchanges, enhanced the prestige of both the leaders and their followers.

The second model suggests instead that the crowds gathering at the ballcourts afforded the opportunity for trade fairs and marketplaces, where each person directly bartered and bargained for goods. Whereas the first model stresses the movement of goods along the lines of social and political relationships, the second model stresses economic motivations and mechanisms.

Recent examinations of ceramics from the lower Salt River Valley support the economic model. Based on analyses of the pottery's temper and clay, it is possible to pin down the production source of individual specimens to particular sections of the valley, allowing us to precisely model the organization of the pottery production and distribution. When this methodology was applied to the clay containers of the middle Sedentary period (A.D. 1000–1070), an unprecedented and truly remarkable result was obtained.

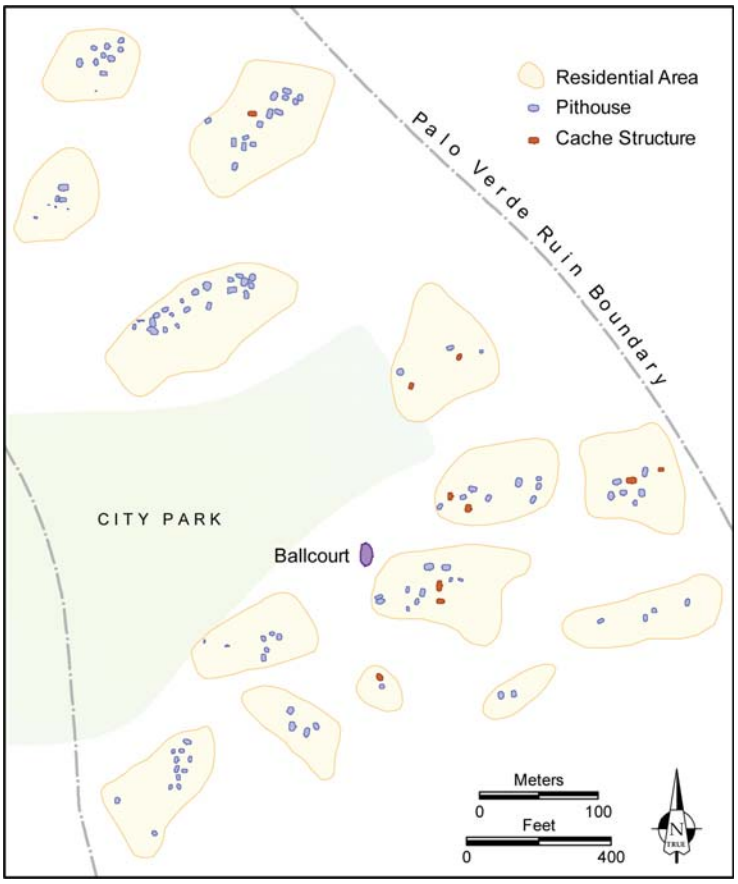
The middle Sedentary period was the time when the Hohokam ballcourt network was at its greatest extent. In the irrigation communities along the lower Salt River, almost no households made pottery themselves but instead relied on several, and often distant, artisans for a full complement of vessel forms. All but tiny percentages of the pottery used in the valley were manufactured in only five production-source areas, three located along the lower Salt River and two more in the middle Gila River region. Each group of potters made only a narrow range of vessel shapes and sizes, which tended to complement the forms made by the other groups of potters. For instance, pottery makers living on the north bank of the middle Gila at Snaketown and nearby settlements specialized in making

decorated red-on-buff pots. They crafted nearly all of the small jars and most of the bowls that were used along the Salt River. Buff wares consistently accounted for about 20 percent of the total pottery inventories, and the same ratios of buff ware bowls to jars, and small to medium-sized to large bowls composed a standard set of decorated vessels distributed throughout the valley.

A reliable and efficient mechanism must have been in place in order to move the pots from a few concentrated producers to multiple far-flung consumers. It is likely that ballcourt events were marketplaces for nonlocal potters to trade their wares. We see no evidence for stockpiling or other traces of elite control over the production or distribution of ceramics.

Moreover, the tiny ratio of ceramic producers to consumers signifies that the potters must have made containers for buyers they did not know—an inconsistency with the first model that stresses the exchange of goods along the lines of social and political ties. In contrast, barter between strangers is a common feature of marketplaces. Finally, given the sheer volume of pottery transactions and the sophisticated division of labor for pottery production, it stands to reason that other kinds of goods were made by specialists for broad-scale exchange.

Additional details about the organizational structure of the middle Sedentary ballcourt network have been gleaned from the excavations conducted by Northland Research, Inc., at Palo Verde Ruin, in Peoria, northwest of Phoenix. Palo Verde Ruin may have been an important node in the regional exchange network, probably contributing significant quantities of meat from large game and highly valued manos and metates. Skeletal elements from bighorn sheep and deer were found in numerous pithouses, and the village was close to a heavily exploited ground stone quarry.



Palo Verde Ruin was a ballcourt village consisting of more than 100 pithouses clustered into 14 residential units, each associated with a cemetery, a trash dump, and extramural features.

In addition, clear evidence for middleman traders, who enjoyed direct access to the exchange market, was uncovered. Ten pithouses, uniformly spread across eight of the residential units, each contained an average of some six large and globular storage jars as well as extremely high amounts of one or more of the following: obsidian from the Vulture source in western Arizona, obsidian from geologic sources in northern Arizona, stone objects, turquoise, shell ornaments, projectile points, and argillite, steatite, and galena.

In one instance, the cached goods were obtained not for local consumption but for barter to a third party. A collection of 104 shell jewelry pieces and whole shells, including specimens representing eight species, was recovered from a structure in one residential unit. The number of items was far beyond the personal adornments of an individual or family. Also, no evidence for shell working was found at Palo Verde Ruin. Thus, we can rule out the idea of a craftsman's cache; rather, the shell artifacts were probably obtained through trade for the purpose of trading them again.

The uniform distribution of the "cache" structures and the evidence for middleman trading probably mean that many Palo Verde Ruin residential groups stowed, and thus controlled, trade wealth. As such, the members of each group could directly exchange their goods. The excavators found no evidence of a centralized warehouse at the village level; communal storage, instead, was the prerogative of individual residential groups, some of whom probably functioned as middleman traders.

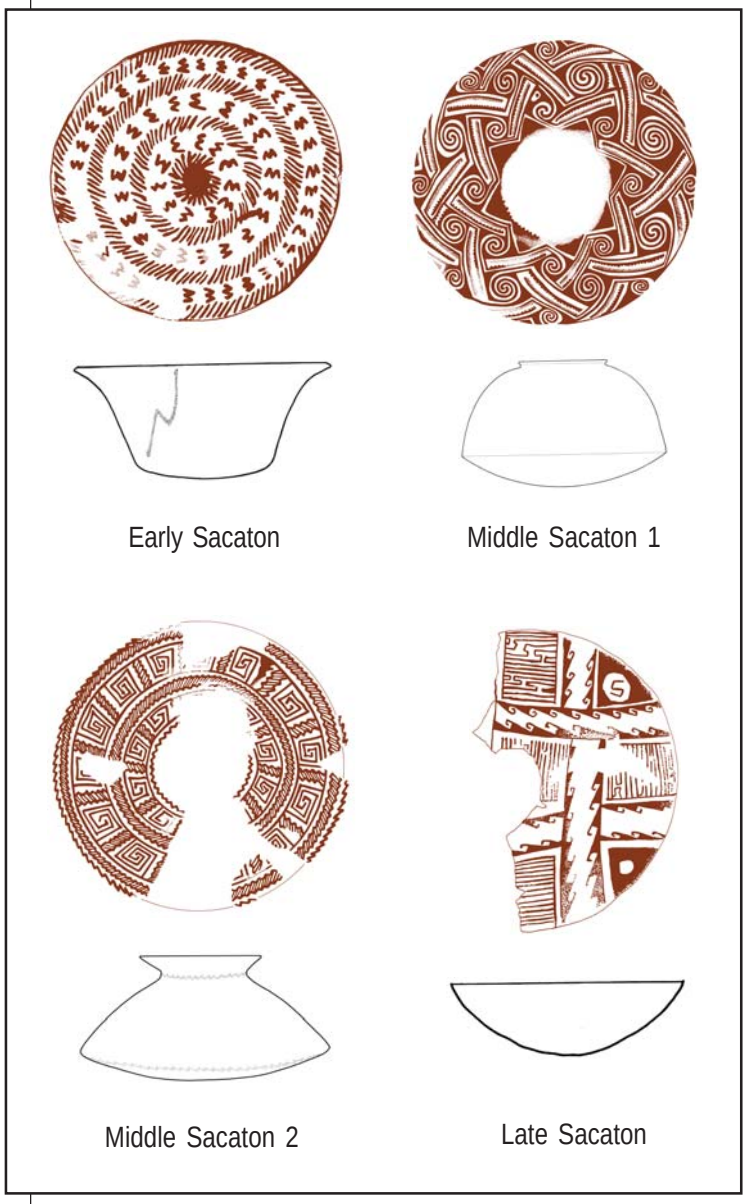
Palo Verde Ruin offers a glimpse of the inner workings of the ballcourt exchange network, at least as it functioned in the northern uplands. What we saw were residents from all parts of the settlement directly participating in marketplace activities and whose actions were apparently motivated by economic concerns.

Keys to Time

Henry D. Wallace, Desert Archaeology, Inc.

TO ANSWER THE DETAILED QUESTIONS that archaeologists ask today, very fine-scale dating of the features and artifacts they excavate is required. In the Hohokam heartland, the pottery known as Middle Gila Buff Ware is the most common dating tool.

Archaeologist Emil Haury was the pioneer in establishing a working sequence of decorative styles that he correlated with the phases of the Hohokam chronological sequence. Starting with his work for Gila Pueblo in 1931 at Roosevelt 9:6, a Colonial period village in the Tonto Basin, and continuing with his masterful excavations at Snaketown in 1934–1935 and 1964–1965, Haury systematically examined high-quality deposits with large quantities of artifacts and the stratigraphic relationships that allowed him to assess the sequence of events. The complexity of the sequence he was dealing with should not be underestimated. Several of the massive mounds at Snaketown that were intended to be strong stratigraphic test cases proved to have been artificially constructed with redeposited fill of mixed ages. Nevertheless, Haury was able to construct a working typology and a phase sequence that carried the discipline forward and provided the foundation for all recent investigations.



The Sedentary period type, Sacaton Red-on-buff, was divided into four new types in the new sequence.

Haury's intent was to establish the framework for the ceramic sequence, and in this, he was eminently successful. However, archaeological questions and approaches became increasingly refined in the 1980s and 1990s. It became evident that the types/styles needed more complete and unambiguous definitions because ceramicists were not typing sherds consistently or comparably. In addition, the long spans of time correlated to the styles were not very useful for the needs of modern archaeologists.

In 1998, I initiated a five-year multiphase investigation with the goal of refining—and if need be, redefining—the Hohokam Buff Ware sequence. A preliminary report was published in 2001 with the Grewe project report from Northland Research, Inc. David Abbott, Alexa Smith, and I did extensive testing using the preliminary refined sequence, and Abbott successfully applied it to the Palo Verde Ruin ceramic assemblage (see pages 4–5). After a second round of analyses and the addition of many new cases (thanks to an incredible team effort by many institutions, companies, and individuals), I published a considerably refined and redefined sequence in 2004 through the Center for Desert Archaeology (Anthropological Papers No. 43) with proposed type names and a revised chronological sequence. Where previously the sequence had been split into eight segments (phases) once decorated wares were introduced, now there are 13.

Creating a ceramic sequence of this sort and the accompanying decorated pottery types is simple in concept but arduous and time-consuming in practice. The basic approach is to identify which traits follow clear temporal paths, record their frequencies in collections excavated from deposits that were deposited over a short span of time, order the pottery collections through statistical techniques that plot similarities, and then use the ordered sequence to establish groups of collections that form the basis of refined type definitions. The types of traits I looked at in-

cluded everything from the widths of different types of lines to the occurrence of dots in the design. Every sherd analyzed was examined for more than 170 separate traits.

The new sequence is already paying significant dividends. For example, we now know that buff ware production and distribution declined dramatically in the late eleventh century. Ballcourts, including those at the Grewe site and at Snaketown, were constructed in the latter portion of the Gila Butte phase, probably around A.D. 800. Further, the capped and palisaded Mound 16 at Snaketown, often viewed as a forerunner to the platform mounds of the Classic period, was constructed and last used in Middle Sacaton 1, currently dated at A.D. 1020 to 1070, and the site of Snaketown, as had previously been suspected, was found to have been largely abandoned by A.D. 1070, at least in the portions of the site that were excavated by Haury.

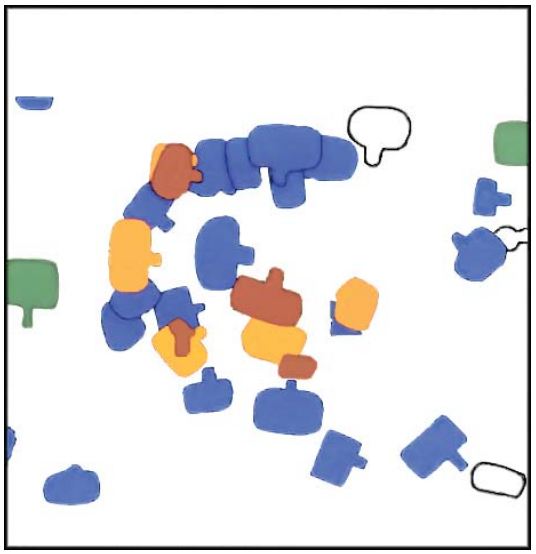
Jannelle Weakly, Arizona State Museum

Flare-rimmed bowls from Snaketown, characteristic of the recently defined Late Gila Butte portion of the sequence.

Household Persistence at the Grewe Site

Douglas B. Craig, Northland Research, Inc.

MANY HOHOKAM VILLAGES and communities in the Phoenix Basin were occupied for hundreds of years. Archaeologists have generally attributed this long occupation to the substantial labor investment into irrigation canals and the need to protect water and land rights. Recent research suggests, however, that villages and communities were not the only property-holding groups in Hohokam society that persisted over time. It now appears that households also held property that was passed from one generation to the next. Maintaining property rights was undoubtedly an important organizing principle for these social groups.

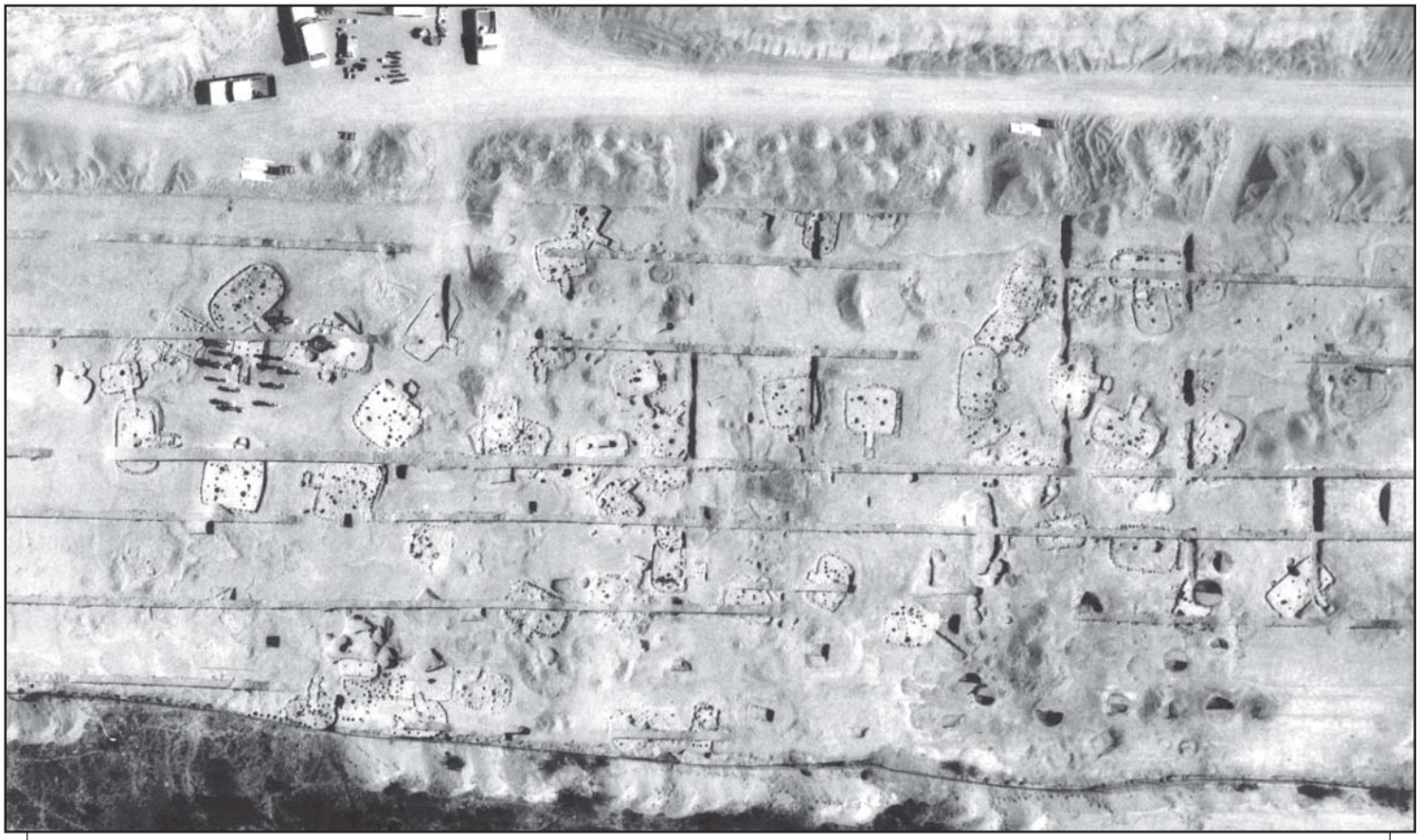


Houses were built and abandoned, and replacements built numerous times around a common open space. This pattern provides strong evidence of multigenerational households and maintenance of household territory over time.

Some of the best-known examples of household persistence come from courtyard groups identified at the Grewe site, the ancestral village to the Casa Grande Ruins. Large-scale excavations were conducted at Grewe in the mid-1990s by Northland Research, Inc., as part of a highway construction project sponsored by the Arizona Department of Transportation. Our work at the Grewe site focused on a large residential district that bordered the central plaza of the site. Directly adjacent to this residential area was a ceremonial district containing one of the largest ballcourts ever built by the Hohokam, as well as a communal cooking area with more than two dozen earth ovens (hornos).

In the Grewe residential district, groups of pithouses were often arranged around courtyards, similar to the layout of many other Hohokam sites. Typically, only one or two houses were occupied at any given time, although this number increased to five or six in the largest courtyards. On the basis of house size data, we estimate that courtyard populations at Grewe averaged 5 to 10 members across time; however, at their peak, a few courtyards may have had as many as 15 to 20 members. These figures are consistent with the general assumption that courtyards were the domain of extended family or multifamily households.

Our research at Grewe has further shown that courtyard groups varied in the length of their occupations. Some were occupied for one or two generations, while others were occupied for hundreds of years. Additionally, only rarely did we find courtyard areas overbuilt by, or encroached on by, other courtyards. The degree of residential continuity seen in these courtyard groups is impressive by virtually any standard. It implies a long-term recognition of place and the emergence of property rights that were transferred across generations. The longevity of



Aerial view of the extensive horizontal excavations at the Grewe site. The cluster of pithouses in the upper right corner of this image is the group of houses illustrated on page 7. (Photograph courtesy of the Arizona Department of Transportation.)

many of the Grewe courtyards further implies that some households were committed to maintaining their property holdings over time.

To assess the degree of social inequality at Grewe, we first developed a method for estimating the amount of labor required to build Hohokam pithouses. We then looked to see where the most labor-intensive houses were located, as well as when they were occupied. Interestingly, we found that most of the "expensive" houses were clustered in only a few courtyard groups. We also found that the courtyard groups with expensive houses were the ones that tended to be occupied the longest. We view this as evidence that wealthier households at Grewe were able to maintain their advantage across several generations. It follows from this that the development of an effective household strategy for maintaining and perpetuating property was an important first step in the emergence of permanent forms of inequality in Hohokam society.

Exceptional Pithouses from the Gillespie Dam Site

T. Kathleen Henderson, Desert Archaeology, Inc.

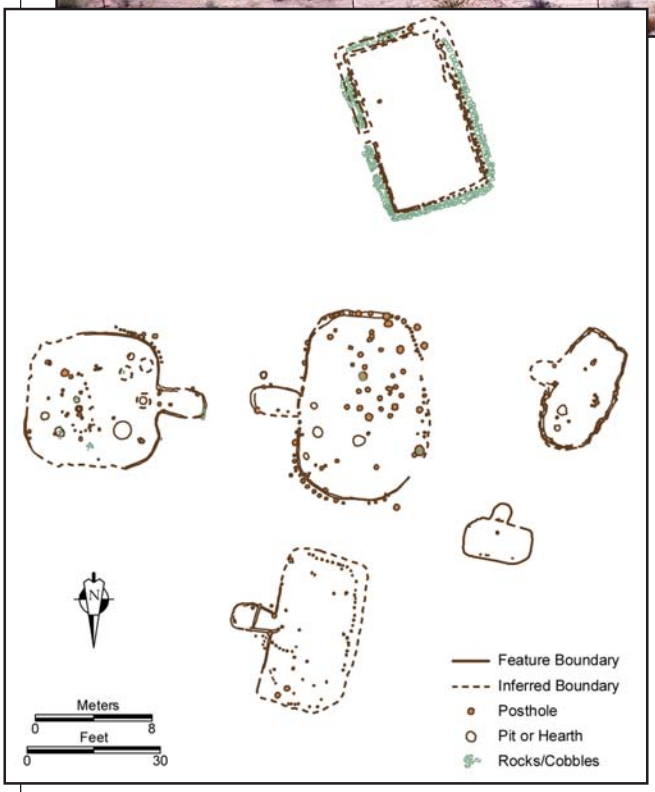
A MAJOR SURPRISE during Desert Archaeology's recently completed work along a Salt River Project power line near Gillespie Dam was the discovery of several exceptionally large Hohokam pithouses. At the Gillespie Dam site, located about 40 miles southwest of Phoenix, one house had a floor area just over 1,075 square feet, a second just under 860 square feet, and a third was just under 650 square feet. In comparison, excavations of thousands of pithouses throughout the Hohokam cultural area have shown that pithouses rarely exceed 325 square feet in area, and most are smaller than 215 square feet.

When we compare the house sizes at the Gillespie Dam site to those at the extensive site of Snaketown on the Gila River, it becomes even clearer that Gillespie Dam is an anomaly. Preliminary dates indicate that Gillespie Dam was occupied from the Middle Sacaton phase to the Early Soho phase (A.D. 1000–1200). During the Sacaton phase at Snaketown, only 7 of 84 pithouses were between 430 and 650 square feet, and none during that time period exceeded 650 square feet.

Known from the outset of fieldwork was the cobble-walled structure visible in the upper central portion of the

upper photograph. Excavations revealed this to be a substantial construction involving a two-course-wide, two- to three-course-high wall of piled basalt cobbles used to bolster a post-reinforced adobe wall. This structure is also quite large, with an interior area exceeding 750 square feet. Although no decorated ceramics were recovered during its excavation, the structure's adobe style suggests it was constructed during the early Classic period.

Henny Wallace



Top: Aerial view of the Gillespie Dam site, looking southwest, taken near the conclusion of the excavations. Bottom left: Fully excavated houses at Gillespie Dam site; map oriented south to match aerial photographs. Bottom right: Aerial photograph of the two largest pithouses.

Henny Wallace

Identifying Social Groups in Hohokam Irrigation Communities

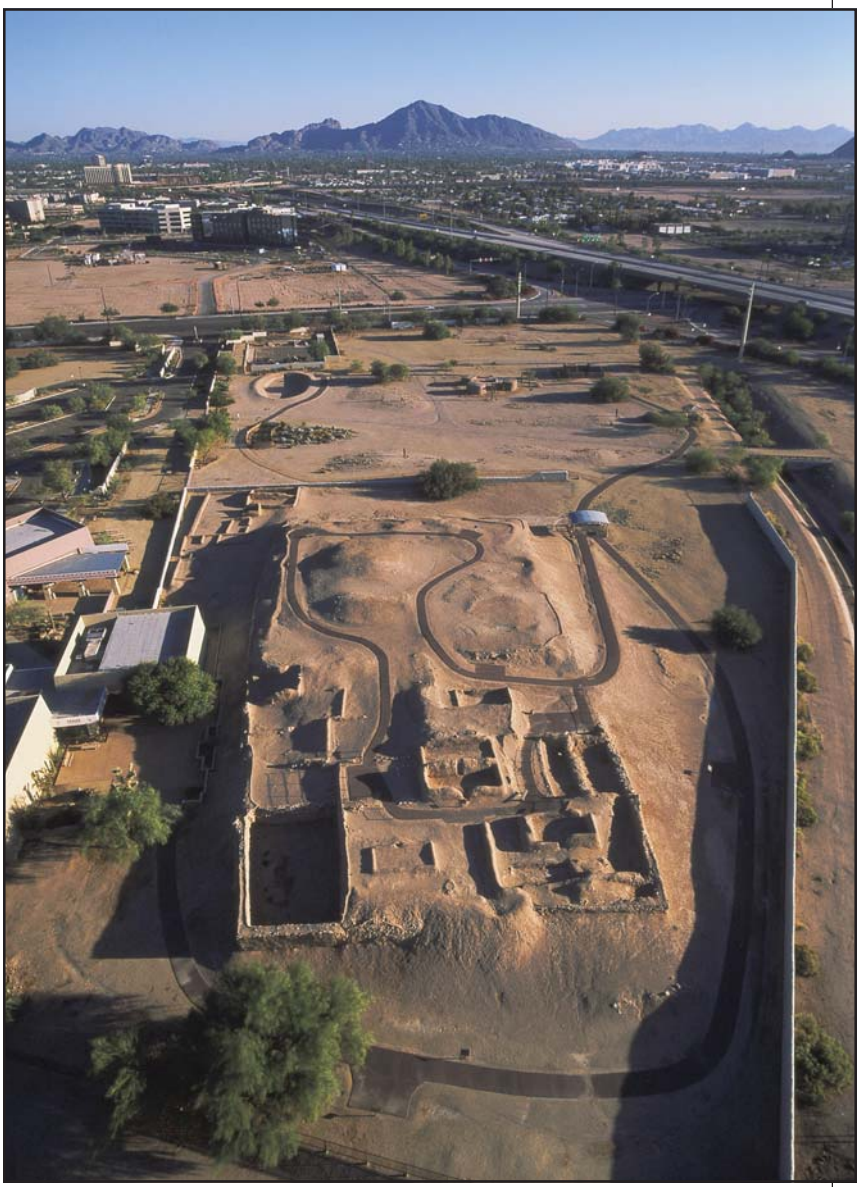
Jerry Howard, Arizona Museum of Natural History

In 1982, when I first began studying Hohokam irrigation systems, archaeologists still had only a basic understanding of how the canals worked, what the elements of the system were, and how water was brought to the surface of fields. This situation soon changed following the discovery of canals during several large excavation projects carried out in the Phoenix area in the early 1980s. By 1988, enough new information had become available that an Arizona Archaeological Council symposium on prehistoric irrigation was held in which 24 papers were presented. The papers showed that substantial progress had been made in understanding the physical nature of the canal systems and their operation. However, the symposium also made clear that much remained to be learned about the organizational structure of these systems.

In an attempt to address some of these concerns, I have adopted a multidisciplinary approach to research that combines ethnographic data and archaeological data. My approach also draws on the ideas of Norman Uphoff, a social scientist who studied the Gal Oya irrigation system in Sri Lanka. Uphoff found that each segment of the Gal Oya system served a specific group of people and was operated by a specific task group. He also identified several organizational levels that typically structure task group membership.

Perhaps the most significant, yet previously unidentified, organizational level was the *command area group*—that is, farmers along a distribution canal who must coordinate and cooperate to irrigate using the same canal. In the ethnographic cases studied by Uphoff, this was the primary level of organization and one that dealt directly with farmers. It was the task group that worked cooperatively to construct, maintain, and repair the common distribution canal. The ethnographic case studies also suggest that a task group maintained the section of the main canal in its area and, in situations such as repairing a headgate, the group worked as a unit. This was also the level in which water was allocated to individual farmers and required labor contributions were tracked.

Another organizational level identified by Uphoff that has relevance for the Hohokam case is the village. Village territories are defined in the Hohokam area by linear residential zones, arrays of villages that cross-cut the canal system. Regularly spaced at two- to three-mile intervals, the residential zones delineated the agricultural territories of the villages. Tasks at the village level would have included water allocation to command area groups and resolution of conflict between them. Land-tenure issues were likely handled at this level as well. All farmers along the same main canal also formed a task group. However, if water allocation to distribution canals was controlled at



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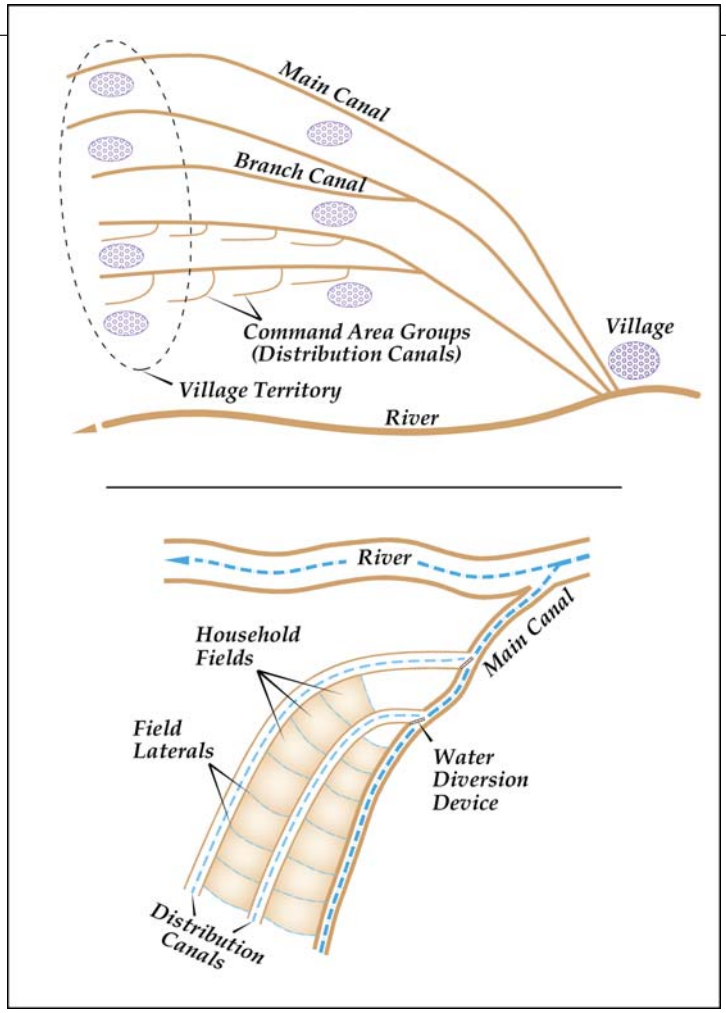
The platform mound site of Pueblo Grande controlled the intake of one of the largest canal systems on the Salt River, and was responsible for delivering water to approximately 25,000 acres of agricultural fields.

the village level, and labor organization was conducted at the level of the command area group, the main canal as a unit may have had minimal organizational impact.

In the Phoenix Basin, large irrigation communities controlling many canals often had large villages with prominent public architecture located at the canal heads. For example, Mesa Grande and Pueblo Grande—each containing a platform mound measuring three to four times the size of mounds at lesser sites—controlled around 25,000 acres apiece under their respective irrigation systems. These sites were also located where they could control the flow of canal water and where floods often created a need for the organization of significant labor forces. This suggests the rise of two administrative centers, each located on a different side of the river. It is reasonable to infer that these centers played a major role in negotiating rights, allocation, and scheduling of water to their respective systems.



Above: The command area group consisted of farmers who cooperatively used a distribution canal. Bottom: The task group maintained the sections of the main canal in its area.

Questions about relationships among irrigation communities located along the same river are tied to arguments about sociopolitical complexity. For the Salt River valley, a major question concerns the formation of a valley-wide sociopolitical entity. Alternatively, we can ask if negotiations took place on this wider scale. A higher level of cooperation could have helped organize labor to construct new irrigation communities, to resolve conflicts, and to create a mechanism for the sharing of limited resources.

It is my belief that a higher level of cooperation emerged by the late pre-Classic or the early Classic period. Computer simulations of agricultural success in the valley further suggest that when the last Hohokam irrigation community was added to the river at approximately A.D. 1000, a critical threshold of water use was exceeded, which resulted in the eventual reduction and/or the abandonment of downstream canals.

Left: A main canal at the Riverview Project, 45 feet wide and 15 feet deep, showing 13 distinct channels or rebuilding episodes. Right: Main canals at Riverview.

Of Canals and Water: Recent Analysis and Unusual Deposits

Michael S. Droz, Archaeological Consulting Services, Ltd.
Manuel R. Palacios-Fest, Statistical Research, Inc.
Glenn S. L. Stuart, Archaeological Consulting Services, Ltd.
Allan Schilz, Archaeological Consulting Services, Ltd.

A footprint with toe impressions excavated by the Arizona State Museum in 1977. (Negative No. 54851; photograph courtesy of ASM.)

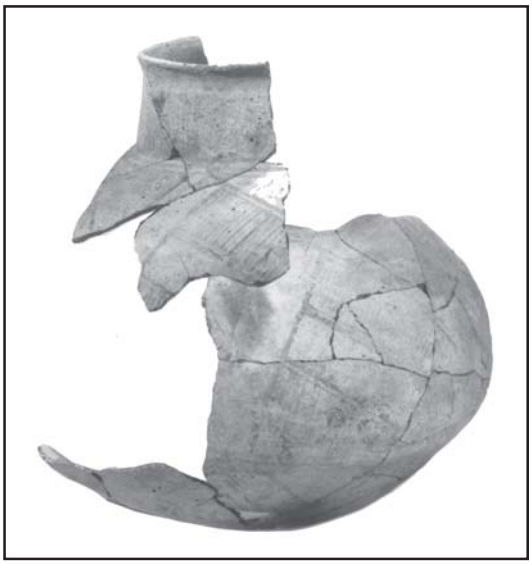
PRIOR TO CONSTRUCTION of Phoenix's new light-rail system, Archaeological Consulting Services, Ltd. (ACS), excavated an area that is inside the approximate boundaries of the site of Pueblo Grande, but outside the Pueblo Grande Museum and Archaeological Park. Our research confirms that one of the canals (Canal 19), excavated by Bruce Bradley for the Arizona State Museum in 1977, traverses the project area.

Canal 19, which was about 21 feet wide and 6.5 feet deep, and roughly paralleled the 1,140-foot contour interval similar to the modern Grand Canal, which forms the southern border of the ACS project area. Canal 19's size, shape, alignment, and proximity to the headgates of nearby Park of Four Waters indicate the canal functioned as a prehistoric main canal. We identified seven levels of silt and clay bedding, revealing several episodes of use.

Of particular note is a dark brown, sandy clay deposit containing ostracode (also known as seed shrimp), mollusk, and pollen evidence that suggests the canal carried water with a lower percentage of salt (known as freshwater) for a relatively long time. Although the Salt River is considered a freshwater stream, its water tends toward high salinity, hence its name. This freshwater episode could have been the result of the canal's use during the late winter/early spring, when freshwater would have come in the form of snowmelt from the upper reaches of the Salt River Basin, through both river flow and upwelling of groundwater.

The sediment load of Canal 19 also differs from that of most of the canals at Park of Four Waters. All seven of its identified stratigraphic units consist of clay to silty clay, indicating episodes of water discharge and headgate closing that resulted in slow to moderately slow and even flows. The fine-grained texture is notable because the other canals that originate at Park of Four Waters have coarser sediments, indicating faster water flows. Perhaps some Hohokam farmers took advantage of a surge of unusually fresh Salt River water and purposely diverted it into Canal 19.

Left: This photograph, taken in 1977, shows the area before it was excavated by the Arizona State Museum. (Negative No. 54793.) Below: Portions of a Casa Grande Red-on-buff jar found at the same level as the footprint shown above, also excavated in 1977. (Both photographs courtesy of ASM.)



Building and Cleaning the Snaketown Canal

Kyle Woodson, Gila River Indian Community Cultural Resource Management Program and Arizona State University

BECAUSE THE AMOUNT OF SOIL excavated during construction of an irrigation canal provides a relative measure of labor input, it can be used to estimate the size of the work force needed for the project. While a canal can be constructed over a period of months to a few years, canal maintenance, especially cleaning a main canal, occurs at least once a year and takes from a day to about a week to complete.

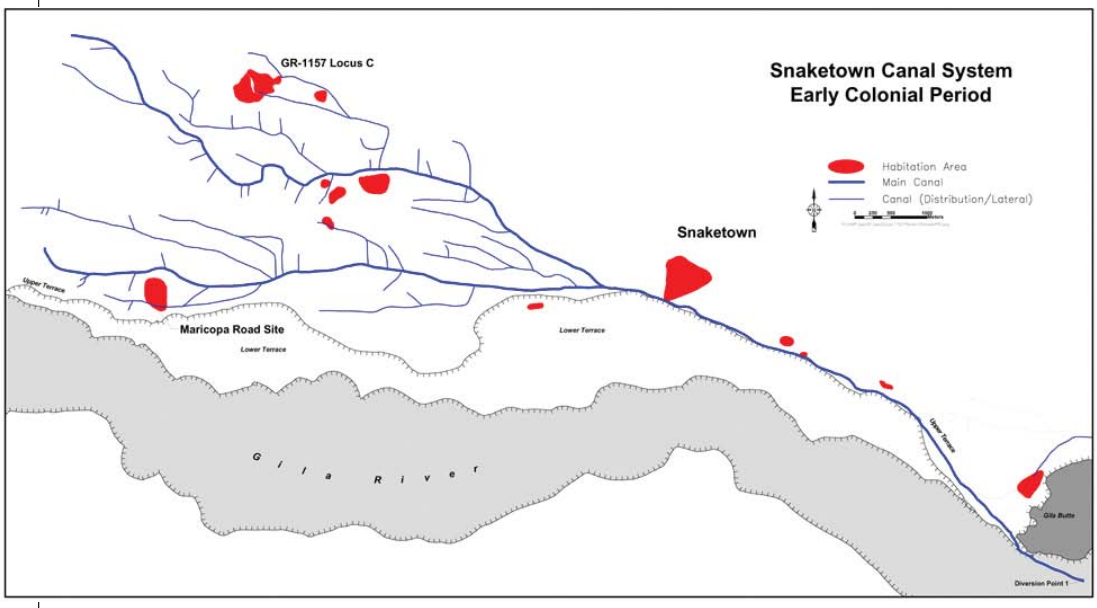
As part of my dissertation research, I estimated the labor requirements and work force sizes for building and cleaning the prehistoric Snaketown Canal. The Snaketown Canal system was one of 12 Hohokam canal systems built along the middle Gila River.

Pima men cleaning the Co-Op Ditch in the Gila Crossing District in 1917. (Photograph on file, Cultural Resource Management Program, Gila River Indian Community.)

The major effort in building the Snaketown Canal took place during the late Pioneer period, with another building episode in the early Colonial period. The maximum number of workers needed to complete these efforts was 141 and 207, respectively. Thereafter, the only efforts invested in main canal construction were two short extensions of the end of the Gila Butte–Santan Canal to connect with the Snaketown Canal. In contrast, cleaning the main canal each year would have required the labor effort of many more people than were involved in building it. Even if the canal were filled with sediment to only a quarter of the water level, cleaning would require between 224 and 681 workers. More workers would be needed if the canal was filled with more sediment.

These results inform us about the size of the group of users of the canal system (also known as an irrigation organization). Ethnographic accounts indicate the irrigation organization is responsible for cleaning the main canal. If so, the irrigation organization for the Snaketown Canal system included a minimum of 224 to 340 members and a maximum of 651 to 1,086 members. By extension, we can estimate the size of the population living along the system.

If the average Hohokam household included five individuals, and each household contributed one person for cleaning the main canal, we can multiply the irrigation organization size by 5 to estimate the population size: 1,120 to 1,700 on the low end and 3,255 to 5,430 on the high end. Although this range is somewhat broad, the use of canal labor effort provides an alternative approach to the elusive problem of estimating Hohokam population size.



More than 40 miles of canals have been documented in the Snaketown Canal system, including the main canal with its two branches, 17 distribution canals, and 42 lateral canals.

The Southwest Germann Site

Banks L. Leonard, Soil Systems, Inc.

A 48-ACRE AREA of the Southwest Germann site, located about 35 miles southeast of Phoenix, in Queen Creek, was recently excavated by Soil Systems, Inc. (SSI). Portions of this site were first recorded in the 1920s by Frank Midvale, who was then documenting sites for Gila Pueblo on the vast Queen Creek alluvial fan. Other parts of the site were later investigated by George Dennis of Gila Pueblo, Albert Schroeder's Salt River Valley stratigraphic survey, and Arizona State University. More recently, other portions of the site have been the subject of contract projects, but SSI's work is the largest single excavation effort to date.

Photograph showing a portion of an adobe compound found in one of the mounds at the extensive Southwest Germann site. The Queen Creek alluvial fan is a surprising setting for large Hohokam villages because it would have lacked permanent surface water for canal irrigation. Instead, farmers would have depended on sheetwash and seasonal floods from shifting channels. (Photograph courtesy of Soil Systems, Inc.)

The SSI project area contained three mounds and 15 surface artifact concentrations. We found features in the three mounds and under each of the surface artifact concentrations, sometimes at three feet or more below the surface. Although more than 1,100 features were encountered, no features were found away from the surface manifestations, despite extensive testing.

Two mounds contained adobe compounds, while the third mound was composed of trash. Other feature clusters contained pithouse groups, large hornos and associated pits, an unusual rectangular reservoir, and clusters of borrow pits. Burials were associated with the compounds and some pithouse groups. Human inhumations and cremations were present, as well as an unusually high number of canine inhumations.

Some features had unusual aspects. For example, many indoor hearths in both pithouses and compound rooms contained small dimples in their bases. Also, in most human inhumations at the site, the body was placed with the legs flexed and the torso and head rotated partly to the left, rather than in a supine posture with the legs extended, as was typical Hohokam practice. Patterns like these may indicate distinctive local customs, implying continuity in the site's occupation over time.

Ceramics and architecture indicated occupations from the early Sacaton, Soho, Civano, and very late Civano or Polvorón phases. Each feature cluster appears to date exclusively or almost entirely to a single phase, indicating the inhabitants of the area moved to take advantage of the shifting surface water conditions.

The relatively unmixed and spatially separate single-period occupations at a large Hohokam village provide a rare opportunity for temporal comparisons at a single site. Preliminary ceramic analyses by David Abbott, Joshua Watts, and Andrew Lack indicate an unusually high percentage of buff ware in the Sacaton and Soho occupations, possibly reflecting local production. In contrast, the very late Civano or Polvorón occupation had little buff ware but included a diagnostic late Salado Polychrome variety (Cliff Polychrome).

Hohokam Population Collapse in the Salt River Valley

J. Brett Hill, Center for Desert Archaeology and Hendrix College

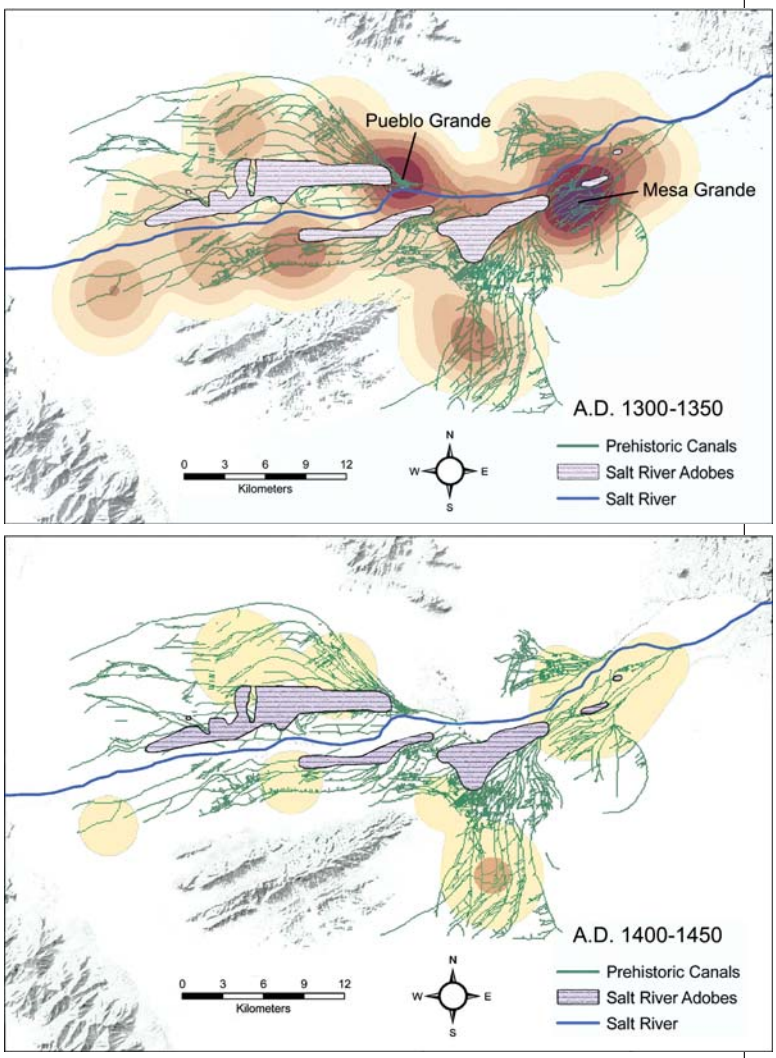
RECENT RESEARCH conducted by the Center for Desert Archaeology describes the Hohokam collapse using a regional model of coalescence in which people responded to social tension by moving to large, centralized settlements and intensifying irrigation agriculture. This led to diminished health and fertility among the Hohokam, and gradual population decline over the fourteenth and fifteenth centuries. Our research is aimed at understanding the culmination of this process in the many individual valleys or subregions of the southern Southwest. In the Hohokam core area, along the lower Salt River, we are developing a model that brings together oral history and archaeological data, thus providing more insight than if either body of knowledge is considered alone.

The earliest accounts of the Hohokam come to us from the O'odham people, who, for more than 300 years, have offered oral traditions of their origins in the time of the Hohokam. These accounts are consistent in important details. For example, they tell of a time when there was unusual human procreation and population growth, followed by flood, drought, famine, and sickness. A great flood occurred, causing destruction and division among two different populations. Those suffering most from flood were identified as Wooshkam, who were ancestors of the O'odham. Following the flood, they were led by their god to the underworld, or south. Those who remained as chiefs of the great houses were Hohokam and had northern or Puebloan affiliation. Finally, the Wooshkam returned from the south to conquer the Hohokam and drive them away.

Why were these problems more difficult than others the Hohokam had encountered during their long occupation of the area? And how did relatively small numbers of Puebloan immigrants become the chiefly occupants of Hohokam great houses? The Hohokam had occupied the largest sites controlling the main irrigation systems for centuries before any evidence of a substantial Puebloan immigration.

Archaeological site databases provide valuable clues to the late prehistoric demography of the lower Salt River Valley, where populations were concentrated along the largest irrigation systems. Information from 52 sites occupied during the Classic period indicate there was a cycle of population growth and aggregation during the late A.D. 1200s and 1300s. This was especially true at Pueblo Grande and Mesa Grande, the two largest sites on the lower Salt River, which controlled the intake of the two largest irrigation systems. At the same time, sites located near the ends of canal systems, such as Las Colinas and Los Muertos, began to draw increasing numbers of immigrants, probably from elsewhere in the Hohokam region, as well as from Puebloan and Yuman groups.

By the mid- to late 1300s, the inhabitants of key sites, like Pueblo Grande and Mesa Grande, began to experience a decline in population along with diminished health and reproduction. Sites toward the ends of canal systems sustained their populations longer, declining in the late 1300s and early 1400s. The average distance between farmers' homes and the canal intakes increased to approximately four miles, a distance well beyond what farmers around



High population density along the lower Salt River from A.D. 1300 to 1350 (top), compared to much lower density from A.D. 1400 to 1450 (bottom). The purple areas mark the "Salt River adobes," heavy soils that would have diminished agricultural productivity. These adobe soils are found in the vicinity of the long-occupied large villages founded near canal system intakes along the Salt River.

the world typically travel to their fields. This posed problems for canal maintenance.

Clues to the cause of this demographic pattern are visible in a paleoenvironmental record of degradation. Abundant evidence of diminished food resources is associated with the most densely occupied areas. Unusually large floods were especially damaging to irrigation in the late 1300s. A third environmental factor, nicknamed "Salt River adobes" by early Anglo farmers, may illustrate important differences between settlements at different distances along main canals. The "adobes"—deposits of heavy silt and clay—were notoriously difficult to cultivate. Geoarchaeological studies indicate that they are a result of excessive Hohokam irrigation and are located primarily near the origins of major canals.

Localized environmental degradation affected those long-occupied sites nearest the headgates earlier and more strongly than the more recently founded sites at the ends of canals. In addition, people near the headgates were less able to respond to local degradation by shifting their land use because canal intake locations were limited. The result of these differences in the distribution of people and environmental impacts was that the long-occupied leading villages were the first to decline. Compounding problems for the larger population, their water system could not be sustained without the maintenance of central irrigation features.

Together, oral history and the archaeological record tell a complex story of social conflict and economic decline among the Hohokam. The early inhabitants of the lower Salt River responded to increasing social tension by aggregating in the central areas of their irrigation systems, while later arrivals were relegated to more distant areas. Prolonged and intensified use of core areas led to environmental degradation and early decline of the long-occupied sites. Thus, the populations were forced to seek subsistence resources farther away. A retreat from these areas put their populations in conflict with those now established in more distant areas, effectively reversing their positions of relative power and wealth.

The process of decay at the longest-occupied Hohokam sites illuminates the apparent rise of Puebloan chiefs in conflict with an original people. Evidence of social conflict and differential hardship among diverse populations found in the oral traditions helps explain why the collapse was more complete than would be expected from purely environmental causes. Much remains to be explained about the Hohokam collapse, but this research highlights the value of bringing together oral history and archaeological data.

Ancient Trails of the Arid Southwest

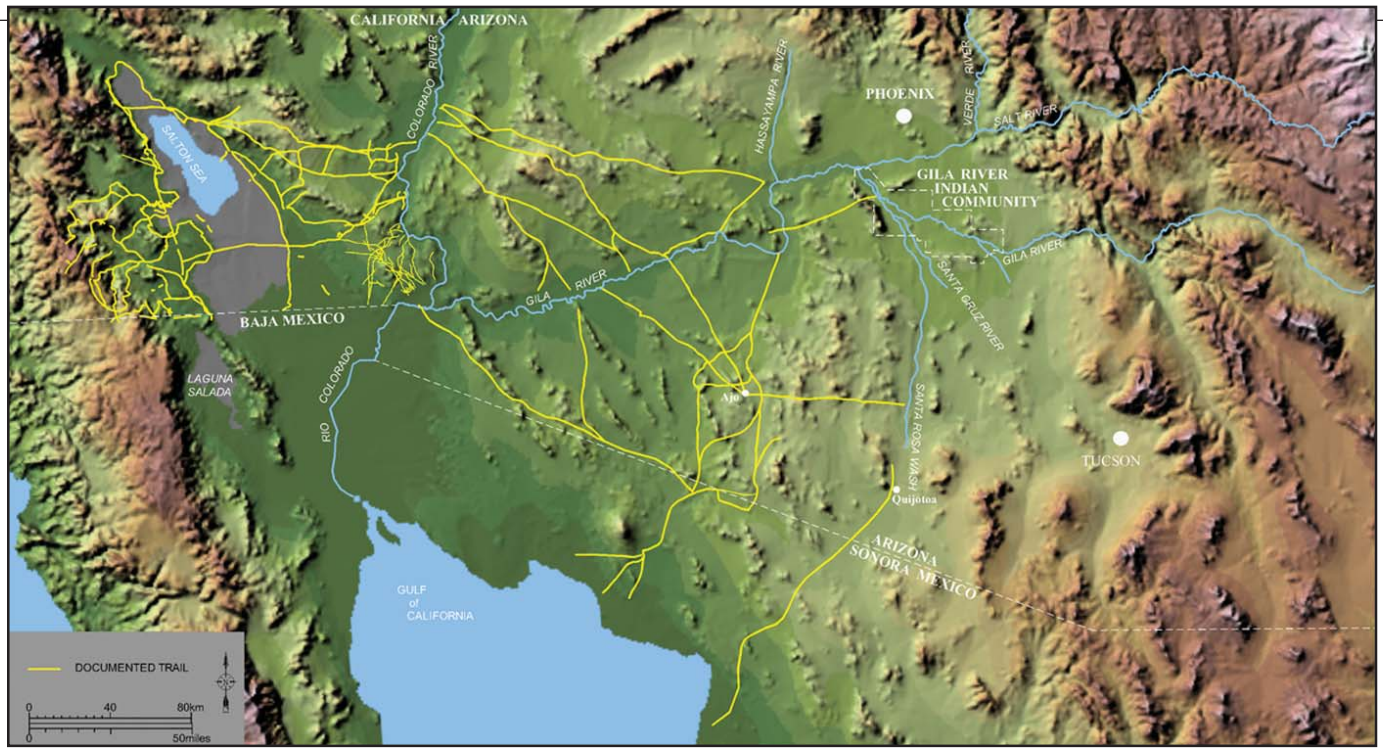
J. Andrew Darling and Barnaby V. Lewis
Gila River Indian Community

INFRASTRUCTURE—from sewer lines to superhighways to the internet—is often fully appreciated only after it breaks down. Systems of travel are a part of infrastructure. So, what was Native American infrastructure like before the arrival of Euro-Americans? It is likely that no European ever blazed a trail that had not been traveled previously by a Native American. During the 1700s and 1800s, Spanish and American explorers relied on Indian guides and couriers to ensure that people and information crossed the deserts safely. Today, modern highways follow some of the same ancient trails.

The O'odham and Pee Posh traveled for many of the same reasons we travel today—to find food, to visit relatives, to worship, to trade, and to make war.

The arid Southwest of southern Arizona and California provides us with a unique, natural landscape where more than 1,000 miles of trail segments are still visible on the desert surface, some of them thousands of years old. These trails offer an unprecedented glimpse of O'odham (formerly Pima and Papago) and Pee Posh (formerly Maricopa) infrastructure, and that of their ancestors, the Huhugam (Hohokam).

Travel was always risky. Many trails converge on mountain passes, which serve as major thoroughfares to other regions and communities. Heading west to Gila Bend, the trail through the Cocomaricopa Pass later became the well-known



Documented trails of the O'odham and Pee Posh. Along these trails, mountain passes were zones of grave danger where loss of goods and life was possible. Here shrines and rock art helped guide and protect the traveler, who left prayer offerings in return for a safe journey.

Butterfield Stage route. Existing for centuries but used only once by Padre Eusebio Francisco Kino in 1699, the Komatke trail connected three mountain passes between the Painted Rocks area, west of Gila Bend, and the O'odham communities of the middle Gila River.

For Native Americans, traveling is more than going from one place to another. Travel can be spiritual. It is a part of tradition, and it is a metaphor for life. *Himdag* is the O'odham word meaning "tradition," but it also can mean "heritage," or even "infrastructure." *Himdag* may also signify "walking a good path." *He'ḱugam vo:g* is a phrase meaning "ancient trail" that refers to the old ways, the traditional ways.

The O'odham journey to gather salt is itself a ceremony. Along the northern beaches of the Gulf of California, the high tides leave salt deposits in a land that is waterless and largely uninhabited. In summer, the O'odham make their pilgrimage to the salt beds, following trails that connect the few hidden natural tanks holding rainwater.

How were such journeys possible? Song traditions of the O'odham provide a link between traveling and leading a good life. To survive in the desert, journeys must be enacted with geographical precision, or the traveler will suffer the consequences. Certain songs, or song series, contain geographical knowledge to negotiate desert landscapes that can come only from experience. As in other life experiences, experiences of travel in the O'odham world were known and passed on through the repeated performance of songs. In a world without maps, a person who knows the songs is someone who not only knows where he or she is going, but more importantly, can recognize the dangers along the way.

The Oriole series consists of more than 100 songs, which, in part, chart a sacred journey over 280 miles from the lands of the Akimel O'odham on the Gila River Indian Community, south to the salt flats in the Mexican state of Sonora. The route passes mountains, Gila Bend, natural hot springs, and the Sauceda obsidian fields, as well as numerous historic and prehistoric settlements. Today, archaeological identification of trails, through survey and high-elevation remote sensing, is piecing together routes of travel with clear correlates to traditional song journeys like those told in the Oriole songs.

Can the Oriole songs provide the key to understanding past ideologies and Hohokam infrastructure? Yes, but only partially, for there is much more to traditional singing than just navigation. Even now, the song culture is alive in the hearts and minds of those who hear and sing the songs and teach them to the next generatio. Landscape loss due to development means that song traditions are one of the few ways that the O'odham and Pee Posh continue to travel spiritual paths. The land lives on in the songs of the people, even though new systems of municipal planning, roads, and urban sprawl threaten the traditional forms of "getting around" that once recognized every rock and spring. A journey is not just a story, it is many stories and many songs, relived and remembered, with every passing step along a well-worn trail.

Rock Art and Landscape Archaeology in Arizona's South Mountains

Aaron Wright, Center for Desert Archaeology and Washington State University
Steve Swanson, Arizona State University
Todd Bostwick, City of Phoenix

Aaron Wright

AN IMPORTANT LANDMARK for past and present peoples, the South Mountains lie between Phoenix's urban environment to the north and the lands of the Gila River Indian Community to the south. The beauty of these mountains, rising 1,500 feet over the surrounding floodplain, was realized early in Phoenix's history. In the 1920s, Phoenix residents convinced the city to purchase large portions of this mountain range from the Bureau of Land Management and to establish South Mountain Park.

Tina Carpenter

This secluded panel exhibits repeated examples of very similar quadrupeds that show different degrees of rock varnish formation. This suggests that they were produced by multiple artisans at different times.

Much of the park's current infrastructure, including trails, ramadas, and buildings, was originally built by the Civilian Conservation Corps in the 1930s. The South Mountains are the world's largest municipal park, covering almost 17,000 acres, and they are visited by approximately three million people each year.

As a nature preserve, South Mountain Park serves to safeguard this landscape for the benefit of the public. However, as many visitors have learned, the mountains also contain a vast array of Hohokam archaeological sites, notably an abundance of prehistoric petroglyphs. The first research into these petroglyphs was undertaken in the late 1880s, by archaeologist Frank Hamilton Cushing, who published several sketches in a report on excavations at nearby Hohokam villages. More than 120 years later, many of these petroglyphs and other archaeological sites remain preserved in the park, yet they have been little studied, are largely omitted from regional syntheses, and face constant threat from natural and cultural forces. This blank spot on Phoenix's archaeological canvas led Todd Bostwick, Phoenix City Archaeologist, and photographer Peter Krocek to conduct a multiyear inventory of the park's petroglyphs in the late 1990s, culminating in the book *Landscape of the Spirits: Hohokam Rock Art at South Mountain Park*, published in 2002.

Bostwick and Krocek's pioneering research has led not only to a full-scale study of the petroglyphs of the South Mountains, but it has also highlighted the need for a preservation plan for the park's cultural resources. These objectives are being met through the South Mountain Rock Art Project (SMRAP), a volunteer-based collaborative research and preservation effort by the City of Phoenix, Arizona State University, and the Center for Desert Archaeology, with the assistance of the Arizona Archaeological Society. SMRAP's goals follow three themes: research, public outreach, and preservation. Research efforts include the first systematic archaeological survey to document all cultural resources within the project area. Outreach initiatives include training in archaeological survey methods and site recording, educational workshops in rock-art recording, and consultation with local Native American communities about the importance of the South Mountains and its petroglyphs.

The results of these efforts will guide development of a preservation plan for the park's cultural legacy, including efforts to curtail vandalism and nominate the park for inclusion in the National Register of Historic Places.

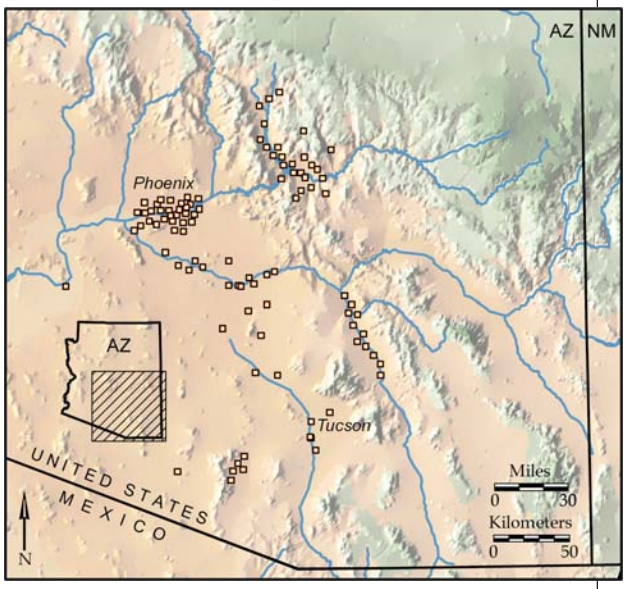
Acknowledgments

The SMRAP is financed by a grant (PN 640507), titled "Preserving the Petroglyphs of South Mountain," from the Historic Preservation Fund, consisting of Arizona Lottery money administered by the Arizona State Parks Board. Additional funding is provided through a Center for Desert Archaeology Preservation Fellowship awarded to Aaron Wright and private funds by Michael Goodman. We thank our project volunteers, the City of Phoenix Parks and Recreation Department, the Arizona Archaeological Society, and the Gila River Indian Community for their assistance.

Phoenix, Tucson, and the Cycles of History

William H. Doelle, Center for Desert Archaeology

BETWEEN ABOUT A.D. 400 AND 1400, the Phoenix Basin was the center of Hohokam life in terms of both population and creative cultural energy. Interestingly, the ratio of the modern population of Phoenix, at more than three million, to that of Tucson, at one million, is similar to what it was in the 1300s. However, in two other time spans, the population dominance between Phoenix and Tucson was reversed. From 2000 B.C. to the first centuries A.D., the Tucson Basin was at the center of a long process of adapting to the new opportunities provided by maize from Mexico and the development of irrigation. Early Agricultural period settlements are not yet known for the Phoenix Basin. Furthermore, when Father Kino first visited what is now southern Arizona in the 1690s, he found Tucson to be populous, the Gila River notably less so, and the Salt River with no population. To put it simply, many of the contrasts between Tucson and Phoenix, historically and in modern times, are related to a single desert resource—water.



The extensive regional system of platform mounds in the 1300s illustrates differences between the Tucson and Phoenix areas that likely applied to most of the Hohokam era. The population of the Phoenix Basin has varied dramatically over the past 4,000 years.

Phoenix Basin water, drawn mainly from the Salt and Gila rivers, derives from highland areas where annual precipitation is high and winter snows lead to an abundant, reliable spring runoff. For Tucson, the headwaters of the Santa Cruz, to the south, are at much lower elevations, and summer runoff dominates in its watershed.

In Tucson, irrigation systems along the Santa Cruz River were constructed and operated with a relatively small labor force. Thus, when regional population was low, which was the case in both the Early Agricultural period and during the 1600s, the Tucson Basin was an optimal place for settlement. Larger populations, and the development of the social and political structure to organize the labor to construct and maintain canals, were necessary before the much more powerful Salt and Gila rivers could be effectively settled. Soon after A.D. 400, those thresholds were reached, and the Phoenix Basin took off. It became the center of population and innovation, and thrived for nearly a millennium. The collapse of this area is still not fully explained, but the dramatic loss of population likely dropped the area below the threshold for success in this environment. Clearly, the nature and quantity of water resources has influenced the long-term and dramatic cycles of the alternating prominence of Phoenix and Tucson.

See the Center for Desert Archaeology website for more information: <http://www.cdarc.org>

THE CENTER FOR DESERT ARCHAEOLOGY, a private, nonprofit organization, promotes stewardship of archaeological and historical resources through active research, preservation, and public outreach. The Center is a 501(c)(3) organization and is supported through donations, memberships, and grants from individuals, foundations, and corporations. Center members receive an annual subscription to *Archaeology Southwest*, substantial discounts on other Center publications, opportunities to participate in archaeological projects, and invitations to special lectures and events. For more information or to join, contact Kate Sarther, Membership Coordinator, at 520.882.6946, or kate@cdarc.org.

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Back Sight

©Adriel Heisey

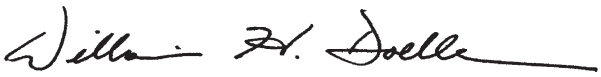
The impressive platform mound at Mesa Grande (foreground) has been preserved, but there was once a much more extensive village in the surrounding area. View to the northwest showing Camelback Mountain on the horizon and the Salt River floodplain in the midground.

UNDERSTANDING THE RISE AND FALL of the Phoenix Basin Hohokam is a work in progress. Unfortunately, while there is still much to learn, massive growth in and around Phoenix has destroyed much of the archaeological record. Only fragments of the original Hohokam fabric are preserved along the Salt River. The best preserved Hohokam archaeology in the Phoenix Basin lies on the Gila River Indian Community, which is why I find the two developments highlighted in the article by Andrew Darling and Barnaby Lewis in this issue of *Archaeology Southwest* (pages 16–17) especially encouraging.

First, over the past decade, the Gila River Indian Community has developed a high-quality program to address the cultural resources located on tribal lands. That program has grown and now employs more than 40 full-time staff, many of whom are community members. Second, the Darling and Lewis article is an example of collaborative research in which oral history and archaeology are brought together with a very productive outcome.

While most new archaeological insights in recent times derive from the hundreds of surveys and excavations conducted prior to development projects, true collaboration between archaeologists and tribes promises creative new approaches to research. This is evident in the Darling and Lewis article, and it showed clearly in the previous work by Center Preservation Fellow Chip Colwell-Chanthaphonh and T. J. Ferguson of Anthropological Research, LLC, with four tribes in the San Pedro Valley (see *Archaeology Southwest* 18[1]). The intensive, shared approach to research that such collaboration requires is important when dealing with the complex tribal histories that are evident in both oral histories and the archaeological record. In a recently completed strategic planning process, Center staff reaffirmed our commitment to such collaborative approaches. It is an essential element if we are to fulfill our newly worded mission "to preserve the places of our shared past." I look forward to exploring the meaning of this mission and its implementation in future Back Sight columns.

back sight (băk sīt) n. **1.** a reading used by surveyors to check the accuracy of their work. **2.** an opportunity to reflect on and evaluate the Center for Desert Archaeology's mission.



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