# Negotiating community and household interests in early irrigation communities of the Sonoran Desert

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## Resumen

Los sitios arqueológicos del Periodo de Agricultura Temprana (*circa* 2100 a.C.-d.C. 50) incorporan la transición de una vida cazador-recolector hacia el desarrollo de aldeas permanentes basadas en agricultura con irrigación en el Desierto Sonorense dentro de la región del suroeste de EEUU/noroeste de México. El desarrollo de conceptos sobre organización corporativa creó la necesidad de negociar identidades en la familia y dentro de la comunidad, y las prácticas mortuorias proporcionan un mecanismo que probablemente utilizan para nivelar las tensiones sociales entre las agrupaciones de casas. Las prácticas mortuorias normativas del Periodo de Agricultura Temprana se caracterizan por inhumaciones primarias, con cuerpo flexionado y pocos artefactos asociados y mínima diferenciación social. Los ritos mortuorios probablemente funcionaron para incorporar una idea de identidad comunitaria, mientras que la localización del difunto funcionaba para demonstrar conexiones entre familias, agrupaciones de casas y derechos de propiedad. Sin embargo, la poca variabilidad que se observa durante el periodo incluye configuraciones numerosas del cuerpo, entierros múltiples y cremaciones que podrían reflejar la expresión de identidad personal y/o de cosmologías diferentes.

**Palabras clave**: Periodo de Agricultura Temprana, elemento mortuorio, irrigación.

## Abstract

Early Agricultural period (circa 2100 B.C.-A.D. 50) archaeological sites embody the transition from foraging to the establishment of permanent, irrigation-based agricultural villages in the Sonoran Desert region of the southwest US/northwest Mexico. Developing concepts of corporate organization would have created a need for mediating social identities and interests between lineages and the community, and mortuary practices

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provide one mechanism likely employed to mitigate social tensions among households. Early Agricultural period normative mortuary practices are largely characterized by single, flexed primary inhumation with limited funerary objects and little apparent expression of social differentiation. The performance of mortuary rituals contributing to these material patterns likely functioned to incorporate a shared community identity, while placement within sites legitimized household interests through descent and inheritance. However, some variability is also observed throughout the period, including numerous body configurations, multiple burials, and cremation and could reflect the expression of personal social identities and/or different cosmological dogma.

**Keywords**: Early Agricultural period, mortuary feature, irrigation communities.

## Introduction

The Early Agricultural period (circa 2100 B.C.-A.D. 50) represents the earliest expression of permanent village settlement based in agricultural investment in the southwest US and northwest Mexico and is characterized by increasing population densities, decreased mobility, and intensive prolonged occupation of residential areas. These settlements develop shortly after the introduction of cultigens in the region by approximately 2100 B.C. and as climatic conditions became more favorable at the beginning of the late Holocene (Mabry, 2005).

Early Agricultural period sites span considerable distance (figure 1) —including most of southeast Arizona and northern Sonora, and small portions of southwest New Mexico and northwest Chihuahua— and demonstrate homogeneity in material culture that denotes continuity across communities and over considerable time (Mabry, 2008; Vint and Mabry, 2015). Residential sites are found along the fertile floodplains of the Sonoran Desert while collector base camps are in upland zones and have shown some evidence for short term habitation (Roth, 1996; Whittlesey *et al*., 2010) indicating the practice of a logistical mixed-subsistence economy (Mabry, 2008; Watson and Stoll, 2013; Wills, 1995).

Even with the considerable resource diversity exploited by these farmer-foragers, communities were intensifying agricultural investment by constructing and managing extensive irrigation canals and field systems; some of the earliest in North America (Ezzo and Deaver, 1998; Hesse and Foster, 2005; Mabry, 1999, 2008). Mabry argues that this intensification "[…] apparently occurred […] in the absence of stresses on food resources from population

pressure, territorial constriction, environmental deterioration, or social factors such as competition for social power" (Mabry, 2008:iv). He further suggests that the combination of settlement-subsistence systems employed were likely associated with the development of corporate organization, which would have included the development of social conventions such as the concept of private property ownership and inheritance, and the continuity of household lineages (Mabry, 2008:272).

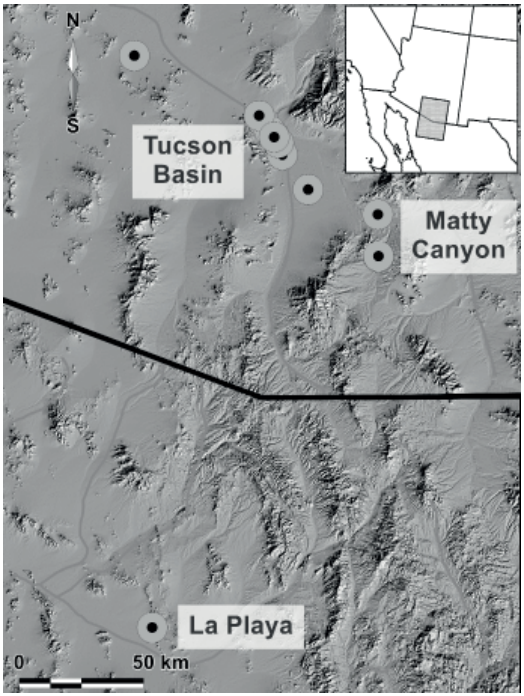


FIGURE 1. Locations of Early Agricultural period areas considered in this research. Image by J. Watson.

Households, identified as clusters of three to six residential pit structures with numerous associated extramural features (Whittlesey *et al*., 2010), likely reflect kin-based organization and segregation within Early Agricultural period site settlement structures (figure 2). These developments provide the foundation of social organization in prehistoric villages in the region and management structures for subsequent complex irrigation systems of the Hohokam (Fish and Fish, 2000; Howard, 1993;

Wilcox, 1991). These social systems developed out of long-term investments at floodplain locals (Doolittle and Mabry, 2006), resultant increases in sedentism and technological investments, and population growth. The mortuary samples that are the subject of this article are further evidence of investment in place as the deceased are incorporated into a concentrated landscape, young and old, and begin to take on new meaning for the living and their relationships to the land and their ancestors.

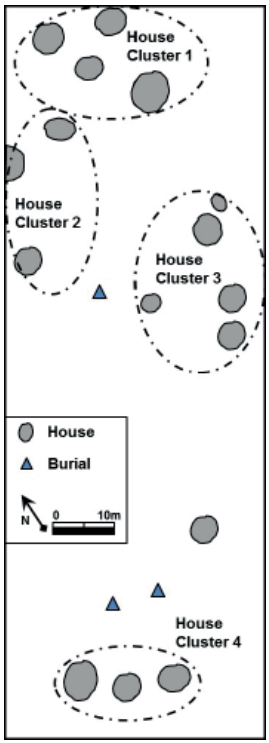


FIGURE 2. Sketch map of major features exposed in large horizontal excavation area at Las Capas (AZ AA:12:111(ASM)). Note house clusters and the proximity (and possible association) of a few burials. Sketch modified from Whittlesey *et al.* (2010).

There is evidence for conflict during this period however (Carpenter *et al*., 2015; Fleming and Watson, 2018; Watson and Phelps, 2016), and given an abundance of resources and small populations, conflict could have stemmed from social tensions within communities attempting to negotiate a balance of rights

and obligations between communal ownership of water and canals and private ownership of fields and yields (Mabry, 2008:272). Some level of cooperation was necessary to manage irrigation systems within the community, but it is unclear how the developing concepts of corporate organization would have created a need for mediating social identities and interests between lineages and the community.

Potter and colleagues (Potter and Yoder, 2008; Potter and Perry, 2011) contend that the practice of mortuary rituals is an important element in the negotiation of identity within village communities and function to reinforce social differences. Of course, identity negotiation occurs through innumerable interactions over the course of the life of the individual and is reflected in the archaeological record across most feature and artifact classes, but mortuary features represent the final stage of negotiation on an individual basis. Most importantly however, this negotiation occurs in different contexts than previous interactions because it is facilitated by the relatives of the deceased in place of the individual themselves. The remains of the deceased therefore present the opportunity for the living to utilize any social capital the deceased controlled to renegotiate interpersonal or community relationships for their own interests.

Individuals in communities with a low degree of social integration would be more likely to aggrandize the deceased, signaling their importance and highlighting vertical social position. In contrast, individuals in communities with a high degree of social integration would be more likely to downplay vertical social position and celebrate the deceased in more subtle, personal ways. Individuals in the middle of this spectrum, such as those Early Agricultural period communities that were likely struggling with balancing household and community interests might find the need to strike a balance in negotiating identity with the numerous characteristics of funerary customs that therefore bear out in resultant mortuary features.

The connection between corporate organization and private ownership of resources such as property and the use of interment of the deceased to legitimate descent and inheritance has long been recognized in mortuary theory (Goldstein, 1976; Hodder, 1982; Howell and Kintigh, 1996; Morris, 1991; Saxe, 1970). But it is additionally important to recognize that some facets of mortuary patterns reflect social and religious values of those individuals who inter the deceased and who intentionally incorporate elements of group identity (Carr, 1995; Parker Pearson, 1999; Rakita *et al.*, 2005; Tainter, 1978).

Here, I consider the breadth of variability within Early Agricultural period mortuary tradition(s) to distinguish how *identity is communicated by participants in the creation of mortuary deposits* and how it reflects relationships and interactions within the earliest permanent irrigation villages of the Sonoran Desert during this critical period of social and technological transition. I argue that normative mortuary practices reflect an attempt to manage multiple social identities and tensions resulting from instability in social organizations within these communities and strike a balance between community and lineage interests. Specifically, identity is communicated through the performance of mortuary ritual by the relatives of the deceased (or corporate group) to memorialize the dead, and simultaneously reinforce community membership/participation and legitimate descent and inheritance of private property.

## Early Agricultural period

The Sonoran Desert comprises 320,000 km$^2$ of Arizona, California, Sonora, Baja California and Baja California Sur. An average of 38 cm of annual rainfall in two rainy seasons creates a rich biotic diversity compared to many other desert environments (Dimmitt, 2000). This biotic diversity provided the basis for successful human occupation in the Sonoran Desert for the past 10,000 years. Sonoran Desert soils also proved to be rich enough for extensive agriculture.

There is some evidence for the presence of proto-agriculture during the late Archaic period from sites in the Tucson Basin in which local foraging groups began to protect, encourage, and perhaps cultivate wild seed and grass species such as amaranth and goosefoot (Doolittle, 2000; Doolittle and Mabry, 2006; Vint and Mabry, 2015). These places correspond to location–specific niches on river floodplains where geological or hydrological circumstances concentrate perennial water to make it more accessible and/or more reliably accessible throughout the year (Nials *et al*., 2011; Vint and Mabry, 2015). Defined as "stream reaches" by Nials and colleagues (2011), these locations provided ideal circumstances for both wild and domestic plant cultivation and many demonstrate continued occupation from the Late Archaic through the historic period (Carpenter *et al*., 2015; Diehl, 1996; Vint, 2015).

Maize arrives in the southwest US and northwest Mexico as early as 2100 B.C. (Mabry, 2008) and is incorporated into an

existing backdrop of proto-agriculture, marking the beginning of the Early Agricultural period. However, changes in subsistence patterns and technology and material culture associated with investment in agriculture are not identified archaeologically in the Sonoran Desert until approximately 1500 B.C. (Huckell, 1995; Mabry, 2008). The Tucson and Tonto basins contain the majority of intensively investigated Early Agricultural period sites (e.g., Ezzo and Deaver, 1998; Huckell, 1995; Mabry, 1999, 2008), but other important sites have been documented along Cienega Creek in southern Arizona (Huckell, 1995), along the Boquillas River in northern Sonora (Carpenter *et al*., 2005; Carpenter *et al*., 2015), and in the northern Phoenix Basin (e.g., Hackbarth, 1998).

Archaeological evidence associated with the Early Agricultural period suggests that once settled, these groups practiced a mixed subsistence economy equally based in foraging and farming (Roth and Wellman, 2001; Vint and Mabry, 2015; Watson, 2008; Wills, 1995). The Early Agricultural period is divided into three phases based on material culture that represent a general trend in increasing village settlement size, artifact density, and social complexity: Unnamed phase (2100-1200 B.C.); San Pedro phase (1200-800 B.C.); Cienega phase (800-400 B.C. & 400 B.C.-A.D. 50) (Mabry, 2008; Whittlesey *et al*., 2010).

The Unnamed phase, or Silverbell Interval (Whittlesey *et al*., 2010:25), represents a protracted period of adaptation to the arrival of maize before significant investment in permanent settlements is evident in the archaeological record (Mabry, 2008). Small, impermanent, earthen habitation structures and storage pits have been identified dating to this phase at a few sites along the Santa Cruz River in the Tucson Basin (Diehl, 2005; Gregory *et al*., 2006). Botanical remains recovered from several of these Early Agricultural period sites indicate that maize had quickly become one among seven important types of plants consumed; the others included saguaro cactus fruit, wild grass seeds, mesquite pods, false purslane, goosefoot, and amaranth (Diehl, 2005).

San Pedro phase sites are generally characterized by the presence of shallow domestic depressions ('pit' structures), storage pits, ubiquitous ground stone, an expedient lithic technology, Empire and San Pedro dart points, and the presence of maize (Huckell, 1995; Roth and Wellman, 2001). In addition, some clay figurines and early ceramic sherds have been recovered from San Pedro contexts (Carpenter *et al*., 2005; Gregory *et al*., 2006; Huckell, 1995; Mabry, 1999; Roth and Wellman, 2001). Evidence for the earliest irrigation canals in the North American Desert West has also been documented at several sites in the Tucson

Basin by about 1500 B.C. (Ezzo and Deaver, 1998; Mabry, 1999). Although the true extent of irrigation canal utilization during this period is not well understood, the development and investment in irrigation technology demonstrates that San Pedro groups were working to intensify agricultural productivity (Vint, 2015). Extensive irrigation canal and field networks documented at Las Capas (Tucson Basin) and La Playa (Magdalena Valley, Sonora) attest to such efforts.

It is also likely that irrigation promoted the development of concepts of private property and facilitated a significant change in community organization during this time. Mabry (2008, 2009) argues that households first emerge during the San Pedro phase as the basic social and economic unit redefining community structure. Prior to ca. 1000 B.C., houses were relatively large and food was stored in outdoor pits suggestive of public storage and food sharing; whereas after 1000 B.C., houses were smaller and food was stored inside, which is suggestive of private storage and consumption within a nuclear family household (Mabry, 2009). House clusters have been identified at several San Pedro sites (see example in figure 2) and lend some credibility to suppositions about the development of 'households.'

The subsequent Cienega phase is characterized by larger villages, increased technological complexity, the establishment of both local and long-distance commerce networks, and the Cienega point type (Vint and Mabry, 2015). The Cienega point represents experimentation with projectile point technology and the introduction of the bow and arrow (Ochoa, 2004; Sliva, 2000). There is also an elaboration of ground stone manufacture techniques, the establishment of a marine shell ornament production industry in both southern Arizona and northern Sonora, and an Incipient Plainware ceramic tradition (Heidke, 2006). Although houses still tended to be relatively small and circular or oval with internal storage pits, larger 'communal' structures have been found at several Cienega phase sites. Mabry (2008, 2009) proposes that community organization continues to evolve during this time with a transition to larger corporate organized households to consolidate agricultural labor. He points to the tentative identification of rings of houses around central courtyards and the presence of burial groups at several sites (Mabry, 2009). The addition of communal structures further suggests that Early Agricultural period groups were employing social integrative mechanisms within the community (Mabry, 2009).

Cienega phase residents of the Tucson Basin also invested in the construction of massive terraces around the summit of a large

volcanic hill adjacent to the Santa Cruz River (Fish *et al*., 2013). The identification (excavation) of a residential-sized pithouse in one of the terraces and a possible community structure dug more than a half-meter into the bedrock at the center of the summit indicate that this location could have been a settlement like those strung along the river's floodplain below (Fish *et al*., 2013). This scale of landscape modification is like that observed in the construction of irrigation systems at contemporaneous sites but was apparently motivated by an entirely different purpose. Regardless of the actual nature of the village atop the hill, the site further highlights the diversity of behaviors observed during the Cienega phase.

Huckell (1995) asserts that by 1000 B.C., maize has become an equally critical part of the Early Agricultural period mixed subsistence system, but that subsistence becomes primarily based in maize agriculture during the subsequent Cienega phase with surplus stored for use during the rest of the year. Schurr and Gregory (2002) identify a dramatic rise in all plant resources in storage features including maize remains, seeds, grasses, cacti, and mesquite over a 200-year stretch of the Cienega phase, indicating an overall intensification of food production and collection. Macrobotanical and faunal remains recovered from Early Agricultural period sites demonstrate an array of both wild and domesticated resources representing a diversity of resources exploited as part of the larger subsistence strategy across much of the Sonoran Desert (Carpenter *et al*., 2015; Dean, 2005; Diehl, 2005; Mabry, 2005; Martínez, 2010; Martínez *et al*., 2011).

There is a significant amount of similarity in material culture among Early Agricultural period sites, which Mabry (2008) has suggested was maintained through potentially expansive marriage networks throughout the period. In addition, the presence of distant material resources at these sites such as marine shells and obsidian indicate some form of long-distance procurement strategy. Recent bioarchaeological research has suggested that Early Agricultural groups employed a gendered logistical mobility strategy (Watson and Stoll, 2013) that could have contributed to greater male mobility and facilitated the practice of male exogamy (Byrd, 2014). The evidence clearly indicates that the Early Agricultural period represents a protracted period of change, marking the transition to agricultural dependence and the establishment of permanent irrigation villages on the floodplains of the Sonoran Desert. It is equally evident that these groups practiced some form of mixed subsistence strategy, which resulted in the procurement of sometimes distant resources and contributed to subsistence and material economies.

**Patterns in Mortuary Behavior**

To date, 460 mortuary features containing the remains of 477 individuals have been recovered from 13 Early Agricultural period sites in the Sonoran Desert (table 1, figure 1). Mortuary features from these sites were grouped into three settlement areas based on proximity and physiographic commonalities, and include the Tucson Basin, Matty Canyon, and La Playa. These remains correspond to a representative sample of the geographic and temporal extent of the Early Agricultural period settlements in the Sonoran Desert.

| *Area* | *Site Name* | *Site No.* | *n* | *References* |
|---|---|---|---|---|
| Tucson Basin | Clearwater | AZ BB:13:6 | 15 | Diehl, 1996; McClelland *et al.*, 2006 |
| | Coffee Camp | AZ AA:6:19 | 5 | Dongoske, 1993 |
| | Las Capas | AZ AA:12:111 | 40 | Watson and Byrd, 2015 |
| | Los Pozos | AZ AA:12:91 | 19 | Gregory, 2001 |
| | Pantano | AZ EE:2:50 | 1 | Hemmings *et al.*, 1968 |
| | Rillito Fan | AZ AA:12:788 | 1 | Wöcherl, 2007 |
| | Santa Cruz Bend | AZ AA:12:746 | 7 | McClelland, 2005 |
| | Square Hearth Site | AZ AA:12:745 | 2 | Wartz and Lindeman, 1997 |
| | Valley Farms | AZ AA:12:736 | 2 | Staten, 2008 |
| | Wetlands | AZ AA:12:90 | 23 | Gutherie and Lincoln-Babb, 1998 |
| Matty Canyon | Donaldson | AZ EE:2:30 | 5 | Huckell, 1995 |
| | Los Ojitos | AZ EE:2:137 | 12 | Huckell, 1995 |
| La Playa | La Playa | SON F:10:3 | 345 | Carpenter *et al.*, 2015 |

TABLE 1. Early Agricultural Period Mortuary Samples from the Sonoran Desert. Table by J. Watson.

*Common mortuary patterns*

The Early Agricultural period mortuary program is dominated by flexed primary inhumation (table 2, figure 3); however, de-

viation from this pattern includes double primary inhumation, secondary inhumation (single and multiple), and both primary and secondary cremation (e.g., figure 4). These additional forms of mortuary features have been documented at several contemporaneous sites (Mabry, 1998, 2008; Thiel and Mabry, 1998; Watson and Cerezo-Román, 2010) and are indicative of a limited expression of mortuary variability between these communities.

| *Treatment* | | *n* | *Percent* |
|---|---|---|---|
| Burial | Inhumation | 427 | 89.5 |
| | Cremation | 50 | 10.5 |
| Placement | Flexed | 211 | 74.1 |
| | Semi-Flexed | 42 | 14.7 |
| | Extended | 32 | 11.2 |
| Position | Left/Right | 157 | 55.1 |
| | Supine/Prone | 105 | 36.8 |
| | Other | 23 | 8.1 |
| Associations | Objects | 70 | 14.7 |
| | Hematite | 114 | 23.9 |

TABLE 2. Summary of Mortuary Treatment across EAP Samples. Table by J. Watson.

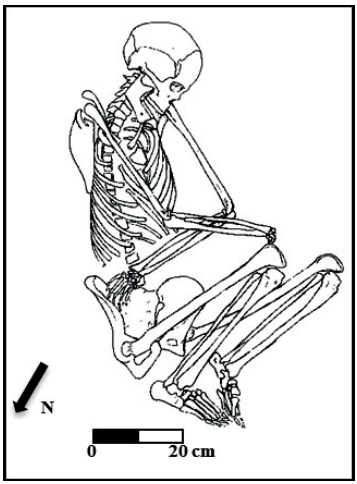


FIGURE 3. Example of normative body placement from Early Agricultural period sites in the Sonoran Desert (adult female inhumation—flexed left, cranium to southeast, hands on hip and knee)—(drawing by J. Watson).

Most primary inhumations were tightly flexed (74.1 percent), although semi-flexed and extended burials were also observed. Several authors have noted evidence for the use of cordage or textiles in binding the burials as part of the interment process (Carpenter *et al*., 2003; Mabry, 1998, 2005, 2008; Thiel and Mabry, 1998). Most individuals were placed on their side (55.1 percent) —and generally in equal proportions right or left; however, supine or prone placements (36.8 percent) as well as seated or head-in/ vertical burials (8.1 percent) were also not unusual. The direction of body placement (or cranial orientation) varied dramatically but individuals were more commonly placed with the head oriented in a westerly direction.

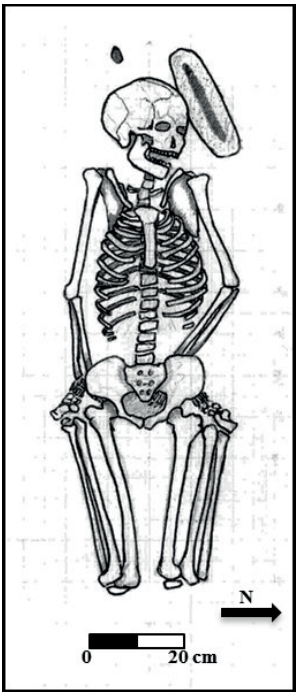


FIGURE 4. Example of variation in body placement from Early Agricultural period sites in the Sonoran Desert (adult female inhumation —flexed supine inhumation, cranium to west, hands under feet, with accompanying ground stone objects)— (drawing by J. Watson).

Non-perishable associated funerary objects are limited among Early Agricultural period mortuary features, documented in less than fifteen percent of the sample (table 2). The variety of asso-

ciated objects is also somewhat limited but includes marine shell jewelry (beads and pendants), utilitarian groundstone (*manos* and *metates*), and projectile points. Other objects documented throughout the area included stone pipes, bone tools, quartz crystals, and mineral pigment. Funerary objects were also placed with features containing multiple inhumations. A shell pendant necklace was recovered from a mortuary feature containing the remains of at least seven individuals from the Wetlands site (Thiel and Mabry, 1998).

The most common treatment afforded individuals interred in Early Agricultural period sites was the application of red ochre to all or parts of the body (23.9 percent). In some cases, pieces of ochre pigment or "patties" (clumps of consolidated powder) were placed with individuals. Associated funerary objects were also often coated in ochre. A significant portion of the individuals from the La Playa complex were completely covered in red ochre, suggesting use by the living as body decoration or application as part of the mortuary ritual (Carpenter *et al*., 2005; Watson *et al*., 2006). In contrast, its application was largely limited to the mouth and pelvic area at sites located in the Tucson basin (Mabry, 2008; Thiel and Mabry, 1998). Raw and processed hematite has been found in numerous contexts at Early Agricultural period sites and covering many non-funerary artifacts (Mabry, 2005). This was clearly an important resource for rituals in these early villages.

There appears to be a weak pattern to the spatial distribution of mortuary features at some Early Agricultural period sites (figure 5). Individuals were interred in a combination of excavated funerary pits, reused storage and cooking pits (extramural pits and pits within residential structures), and on house floors (Carpenter *et al*., 2003; Mabry, 2005, 2008; Thiel and Mabry, 1998). The consistent reuse of existing (non-funerary) pits gives the impression of opportunistic placement within sites (Watson and Cerezo-Román, 2010) but clusters of small numbers of burials have been identified at several locations (Carpenter *et al*., 2003; Huckell, 1995; Mabry, 2005, 2008; Thiel and Mabry, 1998). This has led some authors to suggest that burial clusters represent the precursor to formation of formal cemeteries within sites, likely associated with household clusters (Huckell, 1995; Mabry, 2005, 2008; Thiel and Mabry, 1998). Minimally, the recognition of burial clusters and house clusters with courtyards (Thiel and Mabry, 1998; Vint and Mabry, 2015), are suggestive of emergent site social structure or complexity within Early Agricultural period villages and would have been most likely to form along kinship structures.

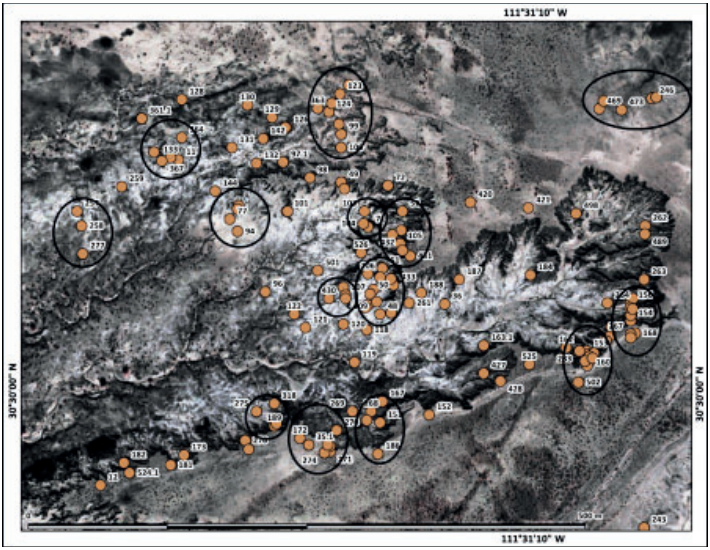


FIGURE 5. Map of burial distributions across a single locus (El Cementerio locus) of the La Playa complex, Sonora, Mexico. Burials are largely exposed due to erosion, but small groupings are evident (outlined by black circles). Image by J. Watson.

*Uncommon mortuary patterns*

Mortuary features containing more than one individual (double primary inhumations) have been documented at four Early Agricultural period sites, including La Playa (Carpenter *et al*., 2003), Las Capas (Vint, 2015), Valley Farms (Wellman, 2000), and Wetlands (Thiel and Mabry, 1997). There appears to be no regularized combination to these features beyond the otherwise normative characteristics of body placement and treatment. They are similar in every way to single primary inhumations with the exception that there two individuals buried in the grave. For example, the eleven double burials documented at the La Playa settlement complex are highly variable combinations (Carpenter *et al*., 2003; Watson *et al*., 2006); consisting of male-male, female-female, male-female, male-child, female-child, female-infant, and infant-infant. Most of these individuals were placed in flexed positions, were painted with red ochre, and several were associated with objects. These cases indicate that although there was certainly something individually special about each of these interments, they followed an overlying prescriptive dictum.

Multiple secondary inhumations have also been documented at five separate Early Agricultural period sites (Carpenter *et al*., 2003; Huckell, 1995; Mabry, 2005; McClelland, 2005; Thiel and Mabry, 1997). These multiple burials similarly share many of the same characteristics common to the normative single primary inhumations, including treatment with ochre and some associated funerary objects. A multiple secondary burial from the Wetlands site included the partial remains of seven individuals; two mostly complete adults (one male, one female) and the partial remains of one adult, and four children (between 5-16 years old). Thiel and Mabry (1998) suggest that the mostly desiccated remains of the partial individuals were exhumed from their original interments and deposited with the remains of more recently interred individuals. They also point out that each individual was minimally represented by a cranium and mandible and several long bones, whereas skeletal elements from the thoracic area and the extremities were little represented. This distribution of elements is most likely the result of a combination of differential preservation and cultural selection and was suggested to be linked to concepts of ancestor worship among these communities (Mabry, 2005:233).

Cremation has also been documented at several Early Agricultural period sites, including Coffee Camp (Dongoske, 1993), Cortaro Road (Hesse and Lascaux, 2005), Las Capas (McClelland, 2008), La Playa (Carpenter *et al*., 2015), Stone Pipe (Minturn *et al*., 1998), and the Wetlands site (Thiel and Mabry, 1998). Most of these cremations date to the Cienega phase and indicate that the practice arrives or develops well after village settlement and agricultural investment in the area. As observed with contemporaneous inhumations, there is a great deal of variability in the expression of cremation during this period, including both primary and secondary contexts (Carpenter *et al*., 2005; Watson *et al*., 2006). Seven of the nine primary cremations recorded at the La Playa settlement complex were remains recovered from formal crematoria, oval or square pits defined by a thick burned-earth rind (Carpenter *et al*., 2003, 2005). The number of cremations dating to this period is small, indicating a limited practice. However, the popularity of cremation grows considerably at the beginning of the subsequent archaeological period (early Ceramic period) and becomes the dominant form of mortuary practice throughout much of the prehistoric Formative cultural sequence in the region (Hohokam in southern Arizona and Trincheras in northern Sonora). The nature of, and processes involved in, the transition to cremation burial in the Sonoran Desert have been addressed el-

sewhere (Watson and Cerezo-Román, 2010) and are beyond the scope of this paper.

Several individuals from Early Agricultural period sites have been identified as deviant burials (Mabry, 2008; Watson and Phelps, 2016). These individuals were placed vertically, head-first in deep pits, or forced into pits which resulted in 'splayed' positions and dislocated joints. Several of these individuals exhibit perimortem fractures and/or embedded projectile points (Watson and Byrd, 2015; Watson and Phelps, 2016). None of these individuals had any signs of burial treatment (i.e.-ochre staining or associated objects) potentially suggesting a different process and significance in placement of the body. One of the earliest examples of these deviant burials is an older (45-55 years old) male from the Las Capas site who was placed head-first into a deep pit. The individual was situated in a large oval, straight-walled pit, with the upper body on the floor, the pelvis laid against the wall, and the legs folded back over the torso and skull. The excavators noted water-lain sediments filling part of the pit and suggested that perhaps the body had been exposed for a short time after being deposited (Mabry, 2008:124). These atypical burials mark a significant distinction in group membership through interment (Watson and Phelps, 2016). In conjunction with the evidence of perimortem violence, the disregard for body placement signals burial by individuals of a different social group; whether by members of a separate community or a different corporate group.

### *Mortuary variability between Early Agricultural period sites*

As the preceding discussion indicates, there is some degree of variability observable in mortuary features from Early Agricultural period sites in the Sonoran Desert. Two potentially significant factors contributing to this variability are the broad time span associated with the period (approximately 2,000 years) and/or the geographic distance between a few of these sites. In a previous analysis (Watson, 2011) I compared the distribution of these mortuary traits between the San Pedro and Cienega phases and between site groupings and found only minor differences in characteristics across the course of the Early Agricultural period. That is to say, primary inhumations that were flexed on the side, with minimal or no funerary objects, were equally common from the early to late phases. However, I did find a significant difference across geographic distances (particularly within the Cienega phase), with the samples from La Playa and Matty

Canyon providing the ends of the continuum and the Tucson Basin sites generally falling in-between (Watson, 2011).

For example, all the burials from the Matty Canyon sample were flexed inhumations (100 percent), compared to only 77 percent of the La Playa burials [97 percent in the Tucson Basin sample]. A similar contrast was observed among funerary objects, where only six percent of the burials from Matty Canyon had associated objects, but 28 percent of the burials from La Playa had associated objects [16 percent in the Tucson Basin sample]. In addition, the diversity of these artifacts was considerably different. Although ochre was applied to a similar proportion of individuals, the Matty Canyon burials only two accompanied by funerary objects (a ground stone object and projectile point respectively), whereas the La Playa burials were accompanied by several projectile points, bone tools, and shell jewelry. As comparisons are made between phases and by site area, the number of observations dwindles and makes statistical comparisons dubious, but these patterns offer an intriguing insight into the potential observation of spatial diversification during the latter part of the Early Agricultural period. In the end however, these preliminary observations do not undermine the general trends observed in the combined dataset considered here. In fact, they probably offer some refinement of the nature of the variability observed in Early Agricultural period mortuary patterns.

## Discussion

It is likely that the development of agriculture in the Sonoran Desert was based in Late Archaic period investments in floodplain resources and niche construction around stream reaches along perennial waterways (Vint and Mabry, 2015). The arrival of maize sometime around 2100 B.C. led to its incorporation into existing cultivation strategies and likely led to the development of irrigation technology by 1500 B.C. and increased settlement permanence. The number and size of these irrigation communities grew and prompted the emergence of organization by corporate descent groups and perhaps concepts of private property (Mabry, 2008). Or minimally, lineages, organized around households, controlled agricultural fields and production, and maintained territorial rights and long-term continuity though inheritance. The management of irrigation therefore required cooperation and the development of social mechanisms to balance the rights and obligations of community cooperation associated with access to

water and the construction and maintenance of irrigation canals and household control over fields and yields (Mabry, 2008). Inheritance is often facilitated through the transfer of property from the deceased to the living descendants and legitimated by the symbolism communicated through mortuary rituals (Hodder, 1990; Morris, 1991; Parker Pearson, 1999). The interminable tension between community and household interests would have required a constant negotiation of social identities within these Early Agricultural period communities.

Mabry (2005) proposes a series of ritual spheres that were active, based on material evidence, to manage tensions and conflicts within communities; these include the social-public, female-domestic, male-communal, male-hunting/warfare, shamanic, and mortuary spheres. These are proposed based on the public manufacture and use of pigment (social-public), women using ceramic figurines as representations of gender within the household (female-domestic), tobacco smoking with pipes in large communal structures by males for secular and religious integration (male-communal), the manufacture and use of knobbed stone trays and the placement of pipes and projectile points in male graves (male-hunting/warfare), and specialized ritual knowledge and possible use of tubes, pipes, cruciforms, dice, petroglyphs, etc. (shamanic).

All these ritual spheres can also be incorporated into the Early Agricultural period mortuary program (Mabry, 2005:232) and displayed for public consumption through the performance of mortuary ritual (Binford, 1971; Carr, 1995; Hodder, 1982; Inomata and Coben, 2006; Parker Pearson, 1999; Rakita *et al*., 2005; Saxe 1970; Tainter 1978). Performance is significant in mortuary ritual because it has the potential to preserve the residues of the living negotiating, displaying, masking, or even transforming social relationships with the deceased (Rakita *et al*., 2005). Performances, and in turn the mortuary rites that accompany them, largely follow a formal prescribed social tradition (Pader, 1982). They also function to communicate social mores, to reinforce social distinctions, and/or strengthen social relationships (Inomata and Coben, 2006). Mortuary rituals are primarily focused on the rite-of-passage that death mark—which separates the living from the dead; and ethnographic studies of mortuary ritual (e.g. – Hertz, 1960; Metcalf and Huntington, 1991; Schiller, 2001) suggest that participation in these rituals allows for "the communicating and assessing of group and individual identities" (Chesson, 2001:4).

### *Social integration and mortuary ritual*

There is an immense cultural complexity that underlies the performance of mortuary rites across societies and social theorists have long fought to define some of the specific contributing factors (e.g., Binford, 1971; Carr, 1991; Chesson, 2001; Durkheim, 1933, 1965; Hodder, 1990; Levi-Strauss, 1983; Parker Pearson, 1999). My interest in this article is in attempting to define how the material residues of mortuary rituals among Early Agricultural period communities in the Sonoran Desert may reflect the active negotiation of identities and varying levels of social integration within these communities. Table 3 presents a framework for examining material characteristics of mortuary features across an idealized continuum of community social integration, from individual aggrandizement to inclusive community integration. The intentional vagueness of these concepts allows us to create generalized expectations to be plied to the material evidence.

| *Mortuary Characteristics* | *Individual Aggrandizement* | *Household Interests* | *Community Integration* |
|---|---|---|---|
| Grave Location | unique | grouped | cementery |
| Grave Construction | | Moderate | Low |
| Body Placement | high variability | moderate variability | low variability |
| Funerary Treatment/Objects | Common/ elaborate | common/simple | uncommon/ simple |

TABLE 3. Mortuary Variability and Social Integration. Table by J. Watson.

Saxe (1970) and Goldstein (1976) argue that choice of location for interment and association with other deceased individuals was commonly tied to concepts of land tenure and inheritance among preindustrial agricultural communities. They suggest that agricultural groups practicing lineal inheritance bury their dead in spatially discrete clusters to reinforce group 'ownership' or inherited rights to specific resources. These practices can manifest across different scales such as within a cemetery (i.e., family plots), within a site, or within a landscape. Similar arguments have been made among Natufian settlements from the Levant where groups of burials are argued to reflect distinctions between intra-community descent groups (Belfer-Cohen, 1995; Byrd and Monahan, 1995; Kuijt, 1996). As communities become larger and begin to formalize space to facilitate greater social control,

interment of the deceased in cemeteries becomes more common and reflects a basic ascription of community standards. In contrast, when an individual and their vertical position, wealth, or achieved status is highlighted during burial, unique locations (or constructions) can be designated to provide additional distinction from nearby deceased community members such as elite burials in the Lambayeque river valley, Peru (Verano, 1997) or the royal tomb at Palenque, Mexico (Tiesler and Cucina ,2006).

The scale of investment in grave construction can vary drastically along the continuum of social integration in that one would anticipate more complex grave structures associated with individual aggrandizement such as temples and pyramids (see examples cited above, and Tiesler and Cucina, 2006; Verano, 1997) and simple grave structures (not complex or grandiose) associated with greater levels of community-based social integration ritual practice. The variability in grave construction proposed to be associated with social integration based at the household level is more likely to reflect horizontal differentiation within communities (Byrd and Monahan, 1995).

The method of interment and how an individual's body is positioned for burial can vary dramatically across numerous scales—including temporal, regional, and site-level perspectives to name a few (Beck, 1995). Primary and secondary burial, inhumation and cremation, flexed and extended, seated and side-placed individual all represent separable measures of practice that could function to display and communicate information to participants in a funeral. Body placement likely follows degrees of variability in practice across the continuum of social integration from low variability associated with following a community-based prescriptive dictum to high variability associated with advertising the social importance of an individual. In many cases however, these patterns may have more to do with cosmology and adherence to religious beliefs (Carr, 1995), which can be an inherent source of social integration (Durkheim, 1965). Kuijt (1996, 2001) effectively argues that secondary deposits of skulls at Pre-Pottery Neolithic sites in the southern Levant represent ritual behaviors designed to "[…] integrate communities and downplay socioeconomic differences between individuals and kin groups in the face of economic and social changes" (Kuijt, 1996:326).

Body treatment and the quality and quantity of associated funerary objects have received a considerable amount of attention in archaeological mortuary studies (Binford, 1971; Brown, 1995; Gillespie, 2001; Hodder, 1984; Kuijt, 1996; Metcalf and Huntington, 1991; Parker Pearson, 1999; O'Shea, 1996).

Although interpretations of funerary objects are still debated, much of the processual and materialist discussion revolves around how they can be interpreted as a display of individual identity and vertical or horizontal social roles (Binford, 1971; Brown 1995; Metcalf and Huntington, 1991; O'Shea, 1996). In line with greater variability and complexity related to grave construction and body placement associated with individual aggrandizement, both quality and quantity of funerary objects are often argued to reflect vertical position, and display wealth and status. At the other end of the social integration continuum, funerary objects are often absent, downplayed, or more likely associated with the expression of horizontal social position (Kuijt and Goring-Morris, 2002). However, at the mid-level of social integration surrounding household interests, one might expect to find a mix of display for both vertical and horizontal positions, as kin or corporate membership affords some individuals (or groups) within communities' greater status.

*Social integration and Early Agricultural period mortuary behaviors*

If we place the patterns observed in mortuary behaviors among Early Agricultural period sites in the Sonoran Desert within the framework for social integration described above (table 3), we identify several characteristics that indicate a greater propensity to support a model of community integration. The potential exception appears to be the location of the grave. The burial of the individual within the site would have functioned to simultaneously symbolize the continued interaction of the dead with the community through physical interment within village boundaries (Hodder, 1990; Mabry, 2005; Parker Pearson, 1999) and display continuity of households and lineages, particularly when buried in clusters, or when placed in intramural pits associated with house clusters or on house floors (Goldstein, 1976; Mabry, 2005; Saxe, 1970). The Saxe-Goldstein hypothesis (Goldstein, 1976; Saxe, 1970) may be partially applicable to mortuary behaviors within Early Agricultural period sites if house clusters do in fact represent households and the burials buried within or nearby represent the placement of ancestors to lay claim to resources held by the household and facilitate inheritance. If Mabry's (2008) suppositions about the development of concepts of private property are reflected in the archaeological record during this time, then it is certainly plausible that households 'owned' plots of land that the community irrigation systems fed and there would be consi-

derable incentive to develop ritual and long-term connectivity to maintain those rights.

All the other characteristics of Early Agricultural period mortuary features considered here (grave construction, body placement, and associated objects) appear to fall further along the continuum of social integration toward participation in a community-based model (table 3). Grave construction is consistently simple, including the placement of individuals in earthen pits. The single difference identified is associated with cremated remains and includes the presence of a thick burnt-earth rind lining the cremation pit. But this is the result of a taphonomic process (heat from cremating the remains of the deceased) rather than an intentional preparative step in the funerary ritual.

The application of normative staging of body placement and treatment would have similarly functioned to display an integrated cultural and community identity. This would have required the performers (representing the household) to actively present their acceptance of mores and symbolize their participation in the community (represented by the audience). These actions hold true for multiple inhumation interments that follow similar normative practices —simply including more than one individual. There is some evidence that a few individuals were afforded greater investment in preparation for burial, such as being bound with cordage or textiles— some of which had intricate designs (Carpenter *et al*., 2003) —but an overarching uniformity in body placement and treatment likely worked toward the integration of identities within the community.

The limited placement of non-perishable funerary objects with individuals, and their simple design would have similarly functioned to promote community integration. Among those objects recovered with Early Agricultural period burials, the type of object may have functioned to subtly display some level of horizontal social identities that could have been shared with both community and household, such as gender or secular/religious group membership (Carpenter *et al*., 2003; Mabry, 2005). There appears to be a gender-based association with the placement of a few types of funerary objects. Specifically, stone pipes and projectile points are exclusively found with males, whereas bone awls and broken figurines are exclusively found with females (neonates have also been found with figurine fragments). Other associated funerary objects are common to both sexes, including shell jewelry, broken milling stones, and lumps of ochre —as well as the full-body application of ochre. Carpenter and colleagues (2003) have suggested that an extended burial from La Playa, of an

older male with several shell pendants and an ochre stained stone pipe under his chin, could represent the interment of a shaman. These associations fit within larger normative and gender-based patterns but they could be signaling a subtle combination of elements that express a social role and community-based identity.

The considerable uniformity in mortuary features observed across the diversity of temporal and spatial dimensions of the Early Agricultural period appear to indicate that these communities could have been ritually performing elements supportive of community integration. The placement of individuals close to, or within houses, may have simultaneously served to sustain inheritance and rights to resources controlled by individual kin or corporate groups. The continued negotiation of corporate rights and community responsibilities is displayed in several of the ritual spheres that Mabry (2008) describes, but none appear to be more apparent than in the appearance and use of "community" houses. The public ritual performance of death rites were an integral part of negotiating tensions within and among, and their social importance is reflected materially in Early Agricultural period mortuary features.

## Conclusions

As permanent settlements in the Sonoran Desert grew larger during the Early Agricultural period, social tensions within communities would have grown as well, and required the formal management of multiple social identities. Mortuary rituals were likely one mechanism employed to negotiate a balance of rights and obligations between communal ownership of irrigation systems and private property.

Normative mortuary practices include single, flexed, primary inhumation, and funerary objects were infrequently placed with individuals. Regularities in burial type and body position could reflect the inscription of an overarching religious dogma and beliefs about how to treat the deceased and aid in the transition to a new social (and biological) status. In contrast, the appearance of cremation burial during the Early Agricultural period probably echoes the introduction of a new cosmology. The limited quantity and variety of associated funerary objects placed with the deceased tends to downplay the material expression of individual identity and aggrandizement. Instead, objects largely appear to reflect gender identities within these communities. Burial and body treatment therefore appear to reflect the performative expressions

of socio-religious cohesion and could have functioned to signal participation/membership in the community (integration). The regularized residues of these mortuary performances stand in stark contrast to the interment of several deviant burials, whose treatment clearly reflects group non-membership and punishment through violence and desecration.

As opposed to the expression of membership associated with most burial and body treatment, placement of the grave within sites appears to be somewhat patterned and may reflect decisions about where and with whom the deceased are placed. Placement of the dead in (presumably related) groups, and often near house clusters with courtyards is more likely to reflect an expression of continuity through the close spatial connection of the ancestors to the living. House groups likely reflect corporate structures within sites, therefore placement of burial groups in these contexts are meaningful associations of deceased ancestors. These decisions depart from the expression of community-based messages to one that could have functioned to legitimize household interests in land tenure and private property through descent and inheritance.

At a time when nascent irrigation agricultural villages were growing, it would have been important to balance lineage and community interests through several social institutions. The presence of "community houses" and evidence for violence may represent the polar ends of this continuum. In addition to agricultural, craft, and ritual production, the performance of mortuary rituals were one of the mechanisms in which members of the community could functionally signal both their participation in larger social dictums and reinforce membership, and maintain and reinforce their claims to land and resources through inheritance and direct interaction with their ancestors.

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