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Recent Research in the Sahuaripa Region of Sonora, Mexico

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This article summarizes research conducted in the Sahuaripa and Bacanora valleys of Sonora, Mexico. Located in the Serrana culture area of the Sierra Madre Occidental, data from this region speaks to several prevalent debates regarding the precolonial era of Northwest Mexico. Radiocarbon dates support demographic reconstructions for sizeable populations post-1000 AD; a time when other regions of the Northwest/Southwest (NW/SW) experienced significant demographic changes. Material cultural patterns reflect substantial local and regional connections with neighboring Río Sonora groups and Huatabampo. Recovered polychrome ceramics demonstrate long-distance connections with Casas Grandes, and obsidian data reflect connections to the Sonora and other neighboring valleys. These data indicate the Sahuaripa Valley participated in a corridor of exchange, which potentially included interaction between Casas Grandes and West Mexico. These observations are relevant to macro-scale patterns of interaction in the late-precolonial NW/SW.

Este trabajo resume las investigaciones realizadas en los valles de Sahuaripa y Bacanora de Sonora, México. Estos valles están localizados en el área cultural Serrana de la Sierra Madre Occidental. La información sirve para entender las interacciones culturales en la época prehispánica del noroeste de

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México. Los fechamientos indican que existían poblaciones considerables posteriores al año 1000 d. C. periodo histórico donde ocurrieron cambios demográficos significativos. Los materiales reflejan conexiones locales y regionales con los grupos de Río Sonora y Huatabampo. Las cerámicas policromadas demuestran vínculos culturales con Casas Grandes, y los datos de obsidiana reflejan su interacción con el valle de Sonora así como con otras regiones. Los datos indican que el valle de Sahuaripa sirvió como un corredor de intercambio, que incluía Casas Grandes y al occidente de México. Estas observaciones son relevantes para entender los patrones de interacción de mayor escala en el NW/SW.

KEYWORDS Sahuaripa Valley, Serrana, Río Sonora, Sierra Madre Occidental, ceramics, obsidian, settlement patterns, mortuary analysis

Archaeologists have long speculated that the Sierra Madre Occidental (SMO) region played an important role in pan-regional trajectories, owing to its geographic position and morphology that make it a natural corridor for contact between the Casas Grandes region and coastal West Mexico (Aztatlán) traditions (Figure 1). This paper will summarize recent research from the Sahuaripa and Bacanora valleys; both are tributaries of the Río Yaqui and located in the Serrana cultural area near a nexus of diffuse boundaries that also includes Río Sonora and Huatabampo. The investigated region is naturally subdivided by physical topography: the Bacanora Valley and the Sahuaripa, Arivechi, Tacupeto, Onapa and Guisamopa reaches of the Sahuaripa Valley. *Reaches* are relatively wide arable sections of valley segmented from each other by narrow canyon sections (Figure 2). Initial survey work was conducted in the Sahuaripa valley in the 1930s by Sauer and Brand (1931) and Gordon Ekholm (1939). In the 1970s, the valley was briefly inspected by William Wasley and a few years later by William Doolittle and colleagues. These efforts served to identify broad cultural affiliations to archaeological cultures located to the north and south. The research we describe began in earnest in late 2014 and included a total of three seasons of fieldwork. This research is exhaustively detailed in three Spanish *informes* (Carpenter et al. 2015; Carpenter et al. 2017; Carpenter et al. 2019) available upon request. Our intent with this article is to summarize the most important findings for an English speaking audience.

Regional Setting

This section offers very succinct overviews of regional traditions to situate the Serrana in broader contexts; fuller reviews are available in Carpenter and Vincente (2009) and Pailes (2017a). The Casas Grandes region is located in Northwest Chihuahua on the eastern side of the SMO. This region was dominated by the primate center of Paquimé, which is unique for its large size, consumption of rare and

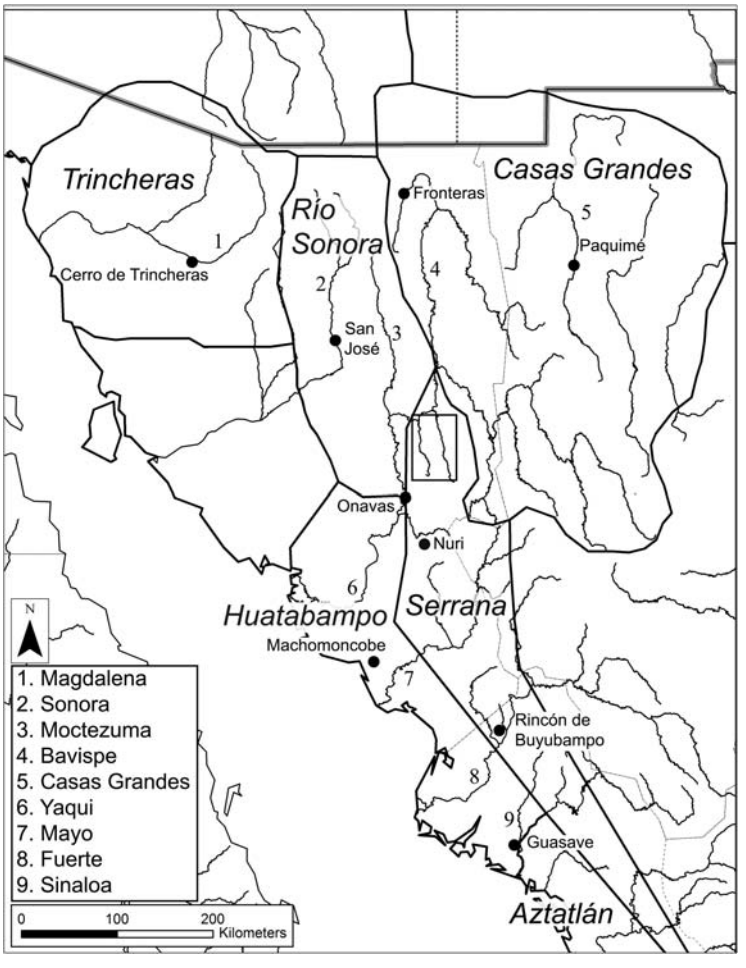

FIGURE 1. Regional traditions, noted sites and river valley; rectangle is area depicted in Figure 1.

foreign goods, and elaborate artistic traditions and likely the complexity of its political system (Di Peso 1974). Substantial debates continue over the political, economic, and ideological reach of Paquimé. For our discussion, the most important points are that interaction with West Mexican societies is obvious. Many of the exotic materials found at Paquimé, as well as inspiration for religious traditions, likely traveled through the SMO in route to Paquimé.

There are two traditions along the Sinaloan Coast relevant to this discussion: Aztatlán and Huatabampo. Aztatlán represents the northernmost Mesoamerican society in West Mexico. Very few Aztatlán domestic contexts have been excavated and the tradition is mostly known from burials that include diverse and elaborate grave goods. Present formulations view Aztatlán as a shared religious and artistic tradition that included substantial long-distance exchange in a context of high

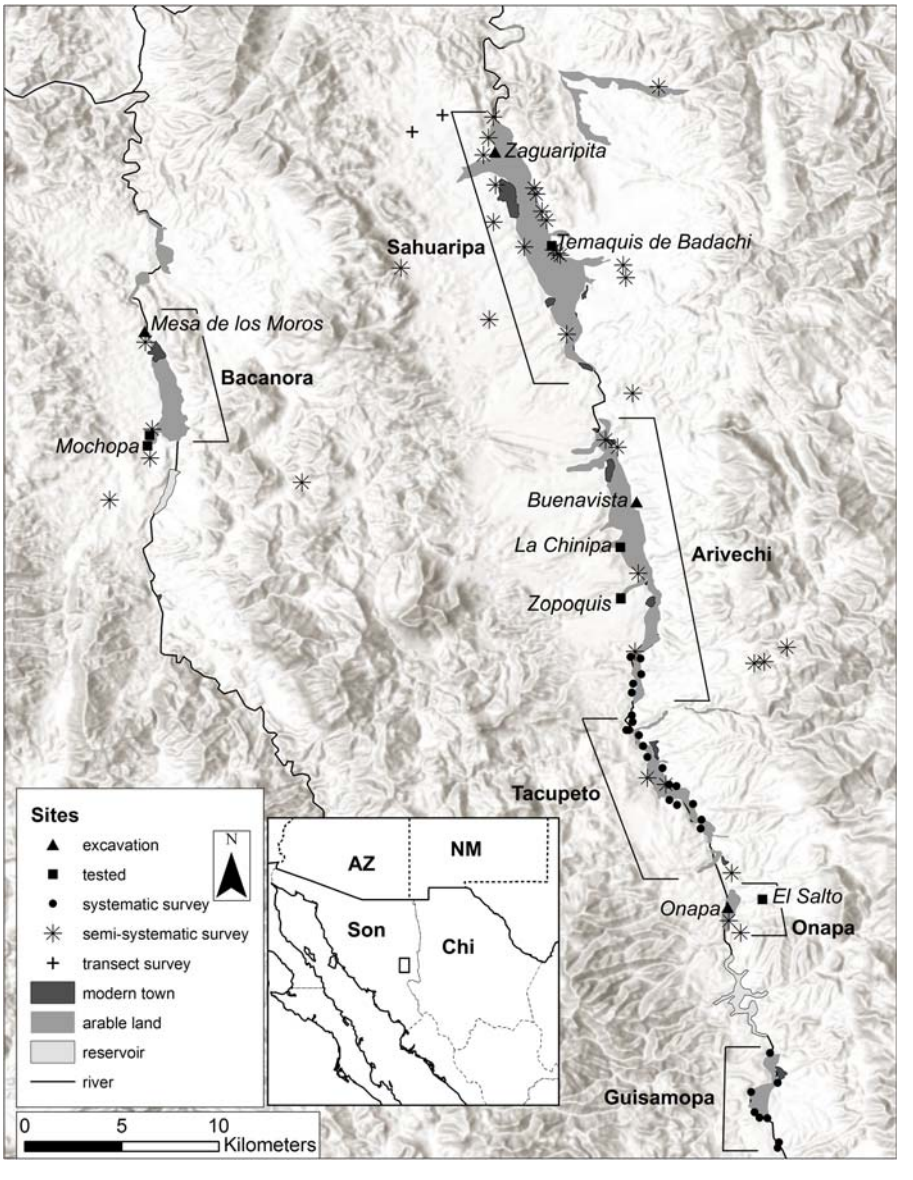

FIGURE 2. The project region and recorded sites. Note, Matarachi sites are out of frame 30 km to east of Guisamopa.

regional diversity (Solar-Valverde et al. 2019). Huatabampo is also a fairly amorphous concept, principally defined by a ceramic tradition of distinct redwares and brownwares and the use of burial mounds. Huatabampo remains an enigma for its combination of mundane domestic architecture and semi-nomadic foraging-fishing economy yet fairly elaborate craft industries and evidence of long distance exchange (Álvarez 2001).

Our research is targeted in the Serrana region, which is closely affiliated with and sometimes included as a sub-region of the Río Sonora cultural tradition (Carpenter and Vincente 2009). These groups occupied the river valleys and foothills of the western SMO. There are subtle differences in material culture remains between north and south regions, some of which will be highlighted below (Pailes 1997). Dense populations occupied discrete sections of river valleys. In the 1500s these groups were highly competitive, regularly engaging in both warfare and exchange relationships. Occasionally leaders obtained influence over large territories such as the *cacique* Sisibotari who purportedly held authority over some 70 settlements from his base in the Sahuaripa Valley (Perez de Ribas 1999). The model forwarded by Pailes (2017b) proposes a common ethnic identity shared across much of the Río Sonora/Serrana by numerous politically independent groups that maintained highly variable connections with both each other and exterior groups. Reconstructing regional exchange relationships and demography remains a primary focus of research across the region.

Research Results

Our research in the Sahuaripa region followed a multi-staged process over three seasons. The first season focused on "semi-systematic" survey, entailing inspection of all sites listed in INAH site files or reported by local residents. The vast majority of habitation sites are constrained to the immediate margins of the river corridor. This zone is also preferred for modern development, so site damage is frequent. The semi-systematic approach significantly undercounts resource extraction sites and agriculturally productive locals outside the principle river corridor. In total, 57 sites were identified by these methods. In the first season of the project, a brief visit to the Matarachi area added four more sites to the total through an unsystematic investigation of this small highland valley. In the third season of the project, experiments at fully systematic survey proceeded by inspecting all level landforms on both sides of the valley for a total of approximately 18 km. These efforts focused on the Guisamopa and southern portion of the Tacupeto reaches and added 27 sites to the total. Lastly, we walked several transects from the river valley to the low foothills across the bajada zones of the Sahuaripa and Bacanora reaches. This effort identified two additional sites, for a project total of 90 (Figure 2).

In the second season, efforts focused on testing eight of the previously identified sites with 1-by-1 units and the recovery of exposed burials under imminent threat of destruction (Figure 2). Two more sites were tested in a similar manner in the third season, but most effort in this season was devoted to the excavation of structures at the sites of Zaguaripita, Buenavista, Onapa, and Mesa de Los Moros.

Dating. A total of 12 ^{14}C sample were submitted to the University of Arizona AMS lab. Three of the samples failed to yield sufficient datable material and one returned a "post-bomb" age that must be the result of intrusive material. One date from the site of El Salto recovered from an aceramic level in a rock shelter is also intrusive, given its proto-colonial age. The dates on the remaining samples

are in line with prior expectations (Figure 3). The three dates from Buenavista, two from burials and one from structure fill, suggest the primary occupation persisted from the mid 1200s to as late as the 1600s. The later end of this time frame corresponds to a wiggle in the calibration curve that produces multiple intercepts. The earlier peak in the distribution is more likely; this more conservative estimate still suggests an occupation that spans beyond AD 1500. One date from Zaguaripita also indicates a proto-colonial age in line with our expectations. There are three dates from Rancho Los Zopoquis, two from pit-oven features and one from a burial, which all agree closely in age. These dates also correspond to a pronounced wiggle; we have no basis for preferring one peak over the other, so dates in both the late 1200s *and or* mid to late 1300s are equally viable.

A lack of dates for some portions of the late precolonial period are probably reflective of the very small sample size. In a regional comparative framework, a concentration of dates after AD 1000 is standard for the Plio-Pleistonce terrace sites targeted by the project. Settlement prior to this period centered on lower elevational

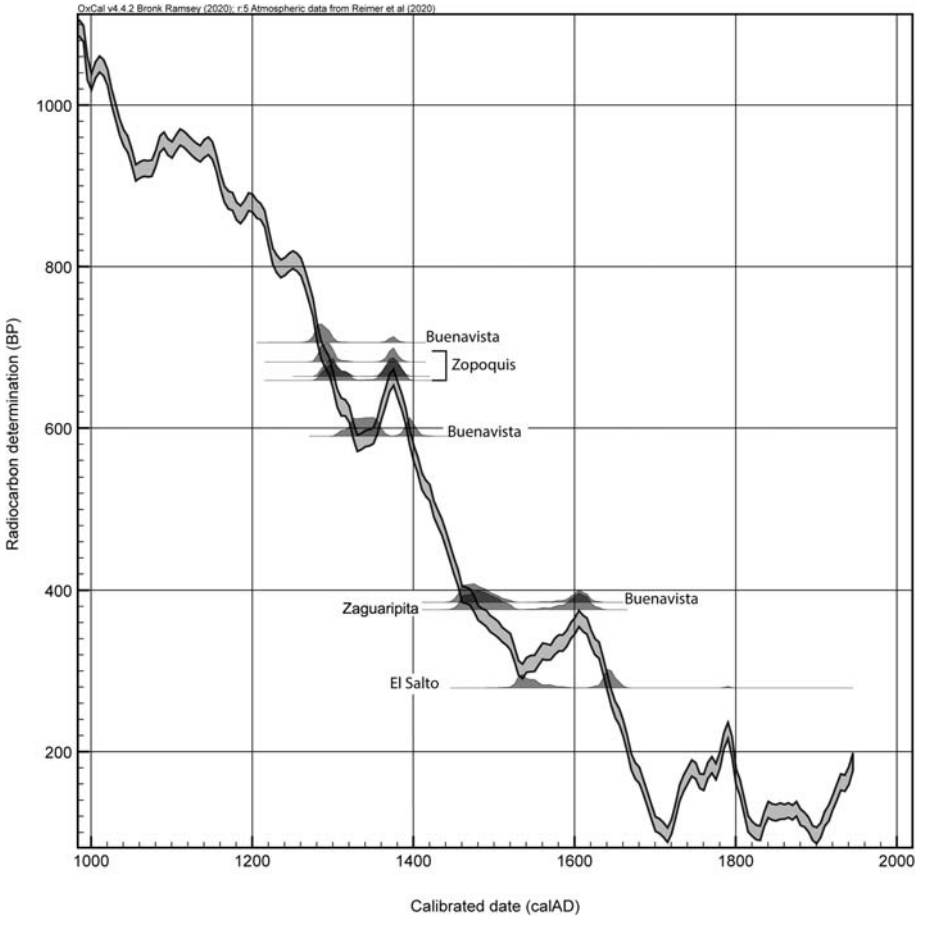

FIGURE 3. ^{14}C dates obtained from the project region.

landforms including first terraces and floodplains (Douglas and Quijada 2004; Pailes 2017a). The only site we investigated in this setting was Onapa, which corresponds to mission Santa Rosalia established in 1677. Painted pre-colonial ceramics and lithics recovered in this investigation confirm there was at least some occupation in these settings. Overall the distribution of dates reinforces findings from other river valleys that indicate, contrary to many parts of the neighboring NW/SW, there are no signs of late precolonial population surges or crashes in the period from AD 1200 to 1500; rather the record is one of stasis until at least the AD 1600s.

Settlement Pattern. The different survey strategies pursued across the project area preclude detailed settlement pattern analysis and most intra-regional comparisons. The area in which systematic survey was undertaken demonstrate that site density was quite high, with an average of 1.04 km between sites in the Guisamopa reach and .60 in the surveyed portion of the Tacupeto reach. The Guisamopa area presented low visibility due to dense vegetation and pertains to the least watered portion of the valley and the second smallest allotment of irrigable land. Thus, we expect these figures represent a minimum of site density. The higher density of sites in the Tacupeto region is likely more standard and suggests every river-adjacent mesa was occupied. Based on the similarity of material culture we infer near-simultaneous occupation of most sites. The density of sites is on par with the Sonora Valley (Doolittle 1988). However, the size of the largest sites in the Sahuaripa region is modest. None of the sites recorded produced surface evidence of more than a few dozen structures. The real count of structures is potentially at least triple this number, but this still places a low threshold on the size of the largest sites. It is likely that modern disturbance destroyed the top tier of the settlement hierarchy. The locations of modern day Sahuaripa, Arivechi, and Guisamopa, are on landforms preferred in the precolonial era. Even so, the estimated maximum house counts of approximately 50 are well below the 200+ counts present in neighboring valleys such as the Sonora, which may also represent the second tier of site sizes. Thus, while the Sahuaripa region is densely populated with sites, *most* individual villages were not large, and the overall population seems to be less than some regional neighbors. This inference is commensurate with the greater amount of water and irrigable land in comparative cases.

There are few signs of multi-settlement integration. We found no forms of integrative public architecture in the Sahuaripa region. The relatively limited distribution of arable land and the limited amount of water in rivers for much of the year would have required some inter-settlement coordination in subsistence production at the scale of reaches. At present, we have no archaeological means of demonstrating the sorts of multi-reach political units occasionally suggested by the ethnohistoric evidence, which, of course, does not mean they did not exist (see Riley 2005).

Our investigation of non-riverine contexts was minimal but speaks to several long- standing questions. The Matarachi data pertains to a small community in the high sierra above 1600 m. Small scale agriculture is presently practiced along the Arroyo de Matarachi. The four sites encountered in this region did not follow the same riverine/arroyo adjacent site placement patterns of lowland valleys. Sites consisted of one or two stone foundation outlines and minimal to

no portable material culture. Based on these observations, the pre-colonial residents of the region do not appear closely affiliated with their lowland contemporaries. Our investigation of the bajada zone was equally informative in its sparseness. Isolated lithics and clusters of lithic debitage were common in this setting, but the only two locations deserving of a site designation were a raw material quarry of red chert (jasper) and a fairly dense lithic scatter that included a Pinto (Middle Archaic) projectile point. The later site is likely a repeatedly utilized camp, which is notable given the sparseness of Middle Archaic materials in the SMO. Overall, our results confirm the overwhelming predominance of riverine corridor occupation.

Architecture and Internal Site Structure. The architecture of the Sahuaripa region conforms to patterns found from the southern US to Sinaloa and Durango. The most common house form is indicated by one to three rows of upright cobbles (10–30 cm) set into the ground with ~10–30 cm of space between each cobble. These (*cimientos*) stones anchored perishable superstructures made of jacal. Excavation occasionally reveals adobe wall stubs that minimally extend beyond the width of the foundation rows. Prepared floors are virtually unknown in the SMO, but the density and orientation of artifacts indicate floors recessed 10–30 cm below the ground surface to the depth of the cimiento stones' base. Hearths and internal post holes are rare, but internal storage pits are sometimes present. Due to the lack of internal features, there is no shorthand for inferring the use of a structure (habitation vs. storage). In the Sahuaripa region, most structures were not free-standing, but rather shared external walls with neighboring structures, forming small room-blocks. The surficial signs of architecture, cimiento stones, are readily dislodged by the ubiquitous cattle trampling. It is common for only a short wall segment to be preserved, indicative of what was once an adjoining room. Ethnohistoric documents also regularly speak of woven mat and other perishable structures, for which it is likely no visible surface traces remain. In short, the perceptible architectural sample is only a component of the original.

Architectural groupings at excavated sites suggest the use of compound walls. These sometimes form one of the external walls of adjoined structures. Compounds are not substantial but would serve to unite units larger than a nuclear family. Many sites were likely composed of only a single corporate group or extended household. The three precolonial sites we thoroughly investigated range in size and accordingly also in internal complexity (Figure 4). The site of Buenavista presents at least three compounds or clusters of architecture, but the site is heavily disturbed by a dirt road that runs through the architectural zone. Zaguaripita is a particularly well-preserved site. On first inspection, there are two areas of habitation likely ascribable to different corporate groups. However, one of these units is located on top of a hill and may be a communal defensive outpost noted in Óbregon's (1928) chronicle of the Ibarra expedition (Carpenter and Sánchez 2021). Finally, the layout of Mesa de Los Moros, most likely reflects a singular corporate group.

Mortuary Analysis. The project sought to avoid burials, but pursuant to INAH regulations when they were encountered either through archaeological work or incidental exposure they were recovered. In addition to the descriptions of work provided in the *informes* cited above, much of the following data is excerpted from a report prepared by Hernández-Espinoza (2017).

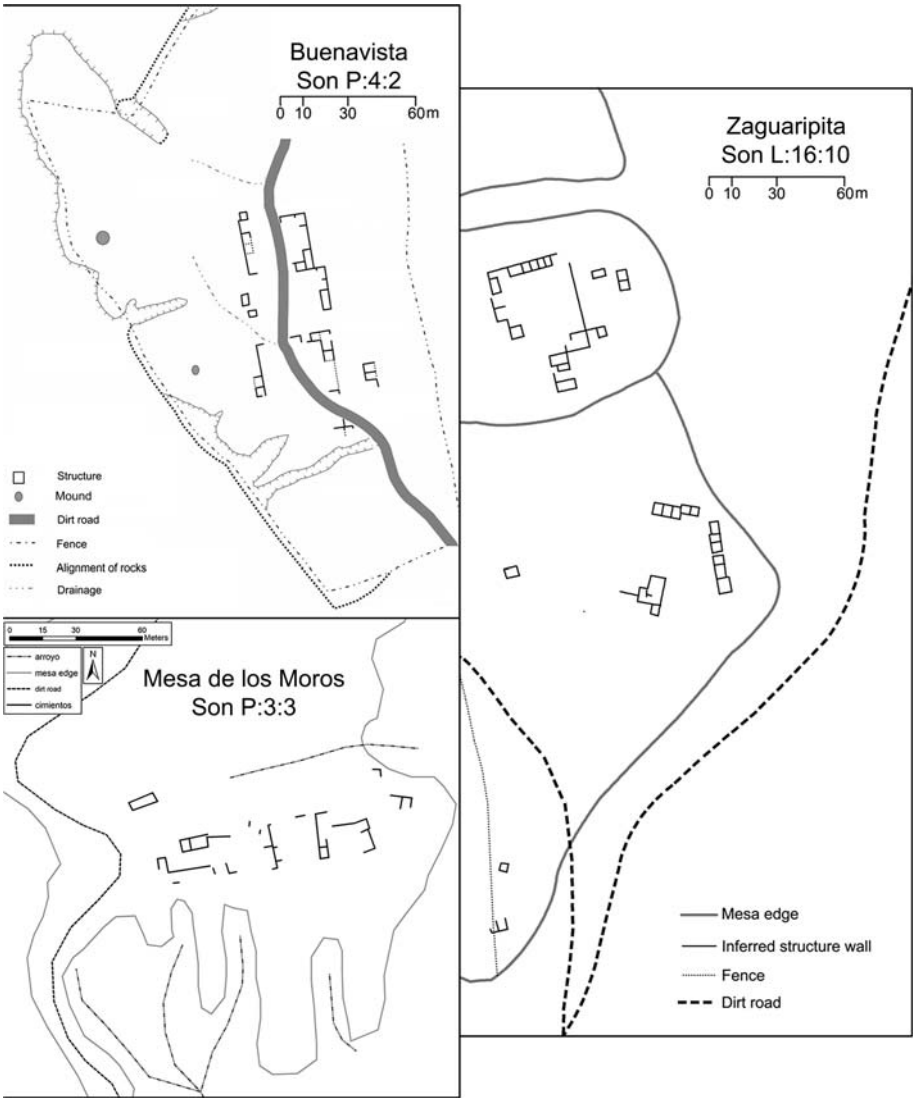

FIGURE 4. Maps of three intensively investigated sites showing organizational layouts. Buenavista and Zaguaripita are after Abrego in Carpenter et al. (2017).

A local resident discovered two burials at the site of La Chinipa. One burial was mostly removed by the previous construction of a highway, leaving a portion of the burial perched 8 m above the road surface. Only segments of femurs were recovered. The burial was likely in an extended position and minimally contained a *Laevidcardium* shell, several small shell fragments, and a portion of an olla. The other burial, located only a few meters away, was also very poorly preserved. Again, an extended position seems most likely. No grave offerings were associated. Both burials were only a few centimeters below the ground surface. Though the disturbed context of the site makes interpretations tenuous, we believe the internment space was extramural.

Two burials were encountered at the site of Buenavista. The first was located in a subfloor context and pertains to a male neonate less than two months of age. The remains were extended and accompanied by carbonized maize and other seeds. A second burial of a likely female child 8 years of age ±2 was encountered in the low erosional profile created by a dirt road. The preservation of the cranium was incomplete but there are indications of intentional deformation in the recovered fragments. This internment space was within a walled compound but likely not within a structure. Though disturbed, the remains were clearly not interred in anatomical position (secondary burial).

At the site of Temaquis de Badachi our team discovered a burial eroding out of a cut bank. Only the cranium and a clavicle of a young child 4–5 years of unknown sex remained in situ. A number of grave offerings were also in place around the head, including a small olla, a shell pectoral, a shell pendant in the shape of a frog, a necklace of very small shell and stone beads, and a bird bone bead.

Our crew discovered a disturbed burial on the surface of El Salto. The remains were predominantly of an adult >30 female intermingled with a few remains of another individual. No contextual information could be garnered from their location. This site is a small rock shelter with no clear evidence of habitation.

At Rancho Los Zopoquis surface erosion revealed an adult female >40 yrs. The burial was in an extended supine position in a non-domestic context. The skeleton displayed tabular oblique cranial modification of the sort know from the site of Onavas (Watson and García 2016) and the larger Huatabampo region (Ekholm 1942). Fragments of long bone collected from the site's surface pertain to at least two other adult individuals.

At the site of Mochopa, our crew found surface evidence of at least two adult burials in a region that was recently bladed to facilitate pastoral activities. Surface artifacts suggest that the space was near domestic structures.

These minimal data allow for some initial speculations. There is no evidence of cremation burial, as there are in some neighboring river valleys such as the Sonora and Moctezuma. Extended burials seem prevalent, but the likely secondary burial at Buenavista and comingled burial at El Salto reflect other mortuary practices. Most burial locations are close to, but not within domestic contexts. Groupings of remains at La Chinipa, El Salto and Mochopa suggest areas for burials if not clear indications of cemeteries. It would be surprising if the location of burials were not symbolically tied to a group's connection to a village and likely larger conceptions of landscape usage, as these sorts of associations are ubiquitous among agricultural populations. However, it is far too premature to infer any strong evidence for a link between the location of burials and concerns with lineal transmission of land or other usufruct rights within a corporate group (Goldstein 1981; Saxe 1970).

Internal group differentiation is hinted at by several lines of evidence. The fact that the richest burial, in terms of grave offerings, is associated with a child could indicate inherited or ascribed statuses, but there are numerous case studies that demonstrate such associations are far from universal (Carr 1995). The one neonate burial, which also represents the only burial unequivocally associated with burial within a domestic structure, likely indicates an age-specific practice.

It is common for children to be interred in domestic structures in the US Southwest such as the Hohokam region (Rice 2017). Ethnohistoric references from the Greater Southwest suggest this was done in the hope that the child would return to the family through a future birth (e.g. Bunzel 1932). The inclusion of carbonized seeds with this burial offers further evidence of specific mortuary behavior. A link between seeds and concepts of fertility is tempting but speculative. Lastly, the presence of at least one and possibly two modified craniums indicates links with southern regions of Sonora. The adult individual at Rancho Los Zopoquis did not necessarily grow up in the region, however, the child at Buenavista suggests cranial modification was a local practice, but it should be stressed this is an equivocal case. The lack of grave offerings with either individual indicates there is no obvious link between cranial modification and high status.

Ceramics. Ceramics offer the most surprising results in terms of regional patterns of material culture. Table 1 provides counts from Sahuaripa and regional neighbors for comparative purposes. The sample discussed in this section is drawn from the last season of work, and thus pertains mostly to the excavated sites of Zaguaripita, Buenavista, and Mesa de Los Moros. The SMO is known for the production of diverse textured wares (Pailes 1997); however, these were nearly absent in the Sahuaripa and Bacanora valleys. The few that were present are likely trade wares from the north i.e. Sonora or Moctezuma valleys. Several corrugated sherds are informative, as they denote access to if not direct participation in a community of practice in ceramic manufacture that stretches from central Chihuahua/Sonora to the Colorado Plateau. Painted wares greatly outnumbered textured wares, particularly a tradition we refer to as Sonora Bichrome that includes the Arivechi R/br and P/br variations described by Sauer and Brand (1931). Though there was a significant predominance of a purple on plain brown paste, paint colors included red, black, purple, and brown variations and paste colors included brown, buff, orange, red, gray, white and sooted black. Some of the paste colors included washes or slips. The range of schemas thus encompasses every bichrome combination known from the NW/SW (Figure 5).

TABLE 1.

COMPARISON OF CERAMIC COUNTS BETWEEN REGIONAL PROJECTS.

	Sahuaripa	Fronteras	Moctezuma	Nuri	Sonora	Onavas
Total	26406	6963	29130	4410	320280	10740
Sonora Bichrome	530	26	37	1	?	360
Foreign or polychrome	41	191	112	1	3% of decor-ated	20
Painted total	580	239	174	3	?	380
Textured	24	671	538	3	?	2
Decorated total	604	910	712	6	8305	379
Assemblage	2017	2018	2012	2019	1976–1978	

Data on Rio Sonora is incomplete, counts are from files in possession of M. Pailes. Foreign origin for Rio Sonora (Pailes 1980)
Onavas data from Gallaga (2013)

The small size of sherds complicates design attribute analysis; 91 percent of sherds fit through 1-inch mesh screen. Designs are almost completely rectilinear and wholly geometric. Many of the painted sherds are similar to ceramics recovered from Onavas (e.g. Gallaga 2013; Garcia-Moreno 2011), however, there are also a variety of design elements present in the Onavas region absent in the Sahuaripa region. Examples include the frequent use of triangles, frets, and ticks as embellishments to line work in Onavas specimens. The color palate and designs of the Sahuaripa ceramics also have much in common with Hohokam and early Trincheras tradition wares. One unique sherd from the project with unusual curvilinear elements appears to be an imitation of a Hohokam Sacaton or Rincon design (Figure 5).

A pilot study utilizing neutron activation analysis (NAA) provides noteworthy provenance data (Ferguson 2018). A total sample of 40 sherds were submitted to the Archaeometry Laboratory at the University of Missouri Research Reactor Center (MURR), including eight Sonora Bichromes, seven suspected Casas Grandes imports, with the balance being plain brownwares. The sherds were from the initial season of field work. Given the small number of specimens, internal groups were identified primarily through visual inspection of elemental scatterplots. Group one comprised only two plain brownware sherds recovered from the Sahuaripa reach. Groups 2 and 2b include five of the seven Casas Grandes Finewares (the remaining two are unassigned). Group 3 comprised four sherds

FIGURE 5. Examples of the Sonoran Bichrome tradition, continuously ranging in color from red to black paint and brown to white paste/slip. Upper left is Hohokam style design sherd from Buenavista.

recovered from the Bacanora Valley. Group 4 comprised 21 sherds from the Sahuaripa and Arivechi reaches. These consistent associations, though based on small sample numbers, suggest geographically consistent patterning at least at the scale of river valleys and possibly in some instances at the scale of reaches. Sonora Bichromes were present in both Group 3 and 4 as well as two unassigned specimens, suggesting widespread local manufacture and some exchange.

The NAA results confirm that suspected Casas Grandes sherds were long-distance imports from northwestern Chihuahua. Five out of the seven specimens plotted with a group identified by Triadan et al. (2017) as "Core Group 2" based on their investigation of Casas Grandes Polychromes. Triadan et al. (2017) argued this group pertains to production in the environs of Paquimé based on the principle of abundance—as opposed to clear matches to known clay sources. The two analyzed polychrome specimens that do not correspond to any of the Triadan et al. groups were typologically equivocal; one is likely an example of pin-stripe Babicora/Santa Ana (Kelley and Larkin 2017). The results confirm a connection between Sahuaripa and Paquimé, a distance of 190 linear km across extremely mountainous terrain.

In the last season of work, we recovered 39 more Casas Grandes sherds. Of these, there was only one definitive Ramos sherd, the rest being Babicora/Carretas (17), Villa Ahumada (10), equivocal Santa Ana (7) or unidentified Casas Grandes (4). Ramos is well known to occur at Paquimé at far greater frequencies than in other regions (Carpenter 2002; Kelley and Larkin 2017; Whalen and Minnis 2009); it is the type most clearly associated with a distinctive Paquimé ideology in its iconic representations (Mathiowetz 2011; VanPool and VanPool 2007). The Sahuaripa data suggest participation in this symbolic system was not prioritized. Other foreign sherds are exceedingly rare with one example of a Sonora Polychrome, likely from northeastern Sonora, and a possible West Mexican sherd. Table 2 demonstrates there is a pronounced inequality in how foreign sherds were distributed in the study region. It appears larger sites disproportionately consumed both foreign and local decorated types by a significant margin.

Lithics. The lithic assemblage is standard for the SMO with a preponderance of volcanic materials utilized in an expedient tool tradition. The raw material emphasis is unsurprising, as the SMO is the world's largest felsic-extrusive-magmatic province. Interesting patterns are most clearly seen in the distribution of projectile points and provenance data on obsidian artifacts.

Projectile points provide one method of tracing patterns of identity. This is essentially the only means to investigate SW/NW group affiliation in the Archaic period

TABLE 2.

COMPARISON OF CERAMIC COUNTS BETWEEN EXCAVATED SITES IN SAHUARIPA REGION.

	Plain	Bichrome	Casas Grandes	Textured
Buenavista	10038	318	30	14
Mesa de Los Moros	6140	29	0	6
Zaguaripita	7550	159	6	3

(Sliva 2015). Across all three seasons of work, recovered Archaic points from the Sahuaripa region include one Pinto point, a likely Gypsum point, five Cienega points, three San Pedro points, and two unidentified specimens. The unidentified specimens both have broad but short blades and parallel sided stems but differ in their shoulders/barbs. These may simply be highly reworked familiar types or represent undefined SMO traditions. Though minimal, this assemblage demonstrates at least periodic use of the SMO throughout the Middle and Late Archaic. These are significant findings, as no sites of this age have thus far been excavated in the SMO. The Archaic point types suggest a cultural sequence similar to the Sonoran Desert.

The late Precolonial period is known for a proliferation of small triangular and occasionally stemmed forms. Many of these are expedient forms, executed on minimally modified flakes. Some caution should be exercised that coincidentally similar morphologies are not mistaken for emic typologies resulting from either deliberate pre-envisioned forms or passive communities of practice that share specific *chaîne opératoire* of manufacture. With these cautions in mind, several projects in NW Mexico argue regionally distinct morphologies reflect ethnic identities or at least interaction networks (Pailes 2017b; Seymour 2017).

Following on this work, we note the following patterns worthy of further investigation from the sample collected in the last year of fieldwork (Figure 6). Elongate-triangular and elongate-triangular-concave-base forms (both with a length at least twice the width) ($n = 11$) are near exclusively associated with the northern portion of the Sahuaripa region, including the Sahuaripa, Arivechi, and Bacanora reaches. Triangular-indented-base forms are another fairly distinct morphology defined by a base concavity with straight edges that is limited to the northern Sahuaripa region ($n = 3$). Triangular-concave-base forms, with a rounded concavity and without flaring ears ($n = 5$) are also well represented but are very similar to forms from the Teonadepa site in the middle Moctezuma (Pailes 2017b). Four points were found in the Sahuaripa valley from Guisamopa to Sahauripa that present very distinctive laurel shapes. These forms result from bifacial reduction and are substantially larger than many late precolonial points with an average length of 37 mm. We designate this morphology as *Guisamopa* points. These limited geographic distributions at the scale of river valleys reflect the approximate scale noted in the above cited references for other parts of NW Mexico. Tentatively, point morphologies suggest a fairly balkanized pattern of identity in the SMO, but one that is not categorically different from other NW/SW groups.

Obsidian provenance analysis provides the other notable set of results pertaining to lithics. The results presented here are summarized from a report prepared by Steven Shackley (2019) on an assemblage of 81 specimens. The methods followed for both the XRF analysis and subsequent statistical grouping of artifacts are reviewed in other publications (Shackley 1995, 2005). Nine different sources are represented in the sample; four of these are unknowns. They are identified as unique sources based on their statistical grouping within the 81 specimens reported here and from samples simultaneously run from the Sonora and Fronteras valleys. Another unknown source is associated with the Sonora Valley based on the principle of abundance—meaning this source is very common in assemblages from this valley, but it has not yet been identified on the landscape.

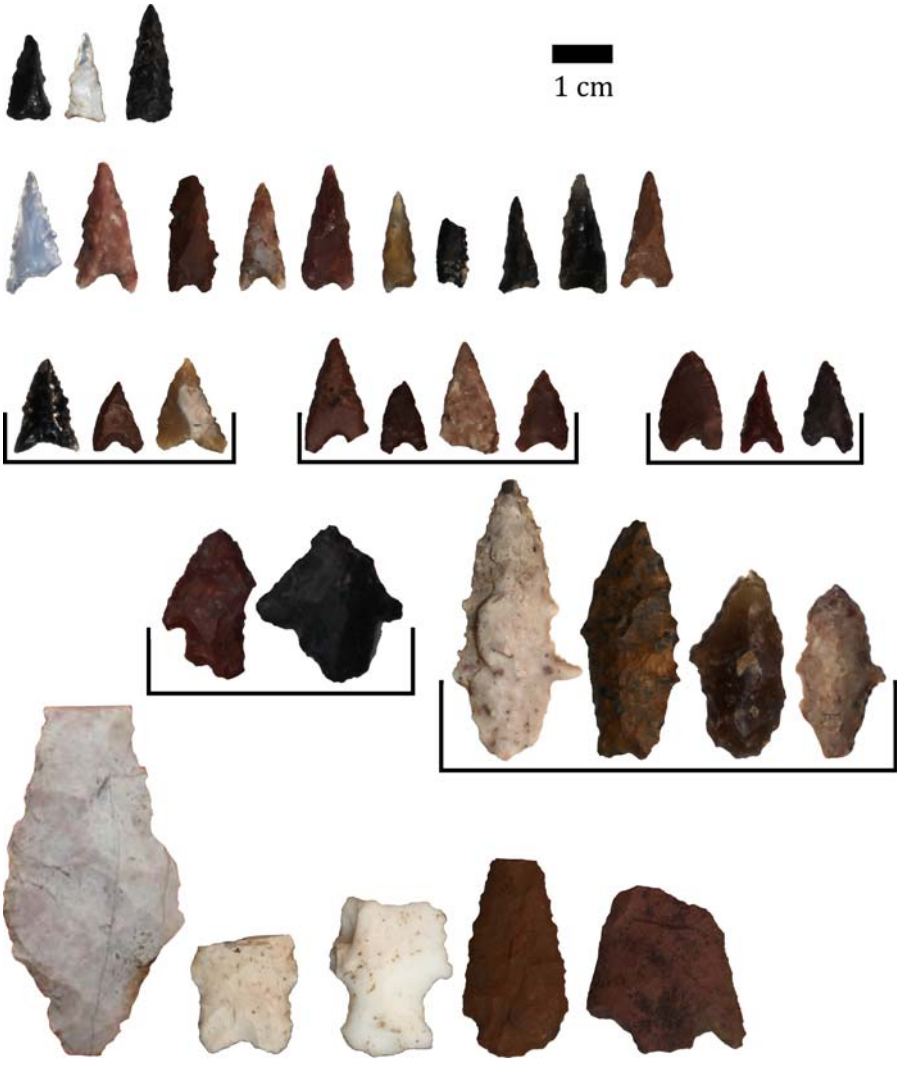

FIGURE 6. Projectile points from the project: top row, elongate-triangular; second row, elongate-triangular-concave-base; third row, left to right, indented-base, concave-base, other base; fourth row, unidentified dart points, Guisamopa points; fifth row, left to right, Gypsum, Pinto, San Pedro, San Pedro, Cienega. All points except Gypsum from third season of work.

There are several notable patterns within the sample in regard to spatial distributions suggestive of a fragmented social network of obsidian exchange. Beginning at the valley scale, the 18 specimens recovered in the Bacanora valley include only four of the source groups. This suggests a much more limited access to exchange networks, although unknown-four only occurred in the Bacanora valley, indicating some exclusive connections. Of the remaining sample, 39 specimens were recovered in the Sahuaripa reach, 9 in the Onapa reach, 12 in the Arivechi reach, and 3 from

isolated locals (Figure 7a). These unequal numbers make comparisons tenuous, as the larger sample size of Sahuaripa would be expected to present more variation. That being said, the infrequency of the Selene source in the Arivechi reach, a very common source in NW Mexico (Dolan et al. 2017; Pailes 2016), is unusual. Perhaps most informative, though, is that even within the Sahuaripa reach there is notable variation between sites (Figure 7b). As the dating for sites is poor, it is possible that some of the recorded variance reflects changing patterns of procurement through time. We emphasize, though, that we believe most sites to be contemporaneous and thus suggest the likeliest scenario is that different households at different sites were free agents in their procurement of obsidian, producing distinct site level assemblages.

Finally, it is worth considering the obsidian assemblage as a whole for its implications to patterns of exchange and connectivity. The unknown sources certainly complicate this, as they could potentially be located anywhere in the SMO given its overall felsic volcanic composition. The Fronteras ($n = 69$) and Sonora ($n = 145$) valley assemblages combined only included one specimen each from unknown groups one, two, and four. Together these sources constitute 31 percent of the Sahuaripa sample, which suggests these sources are located nearer to Sahuaripa. The sources of Selene and Agua Fria are located relatively close together in the upper Bavispe watershed and constitute 43 percent of the Sahuaripa sample. Communities that exploited these sources would be encountered in route to Paquimé, assuming drainage systems served as movement corridors. Their presence is thus unsurprising given the connections already established in regard to ceramics. The 19 percent of the sample from the Río Sonora is somewhat surprising but is

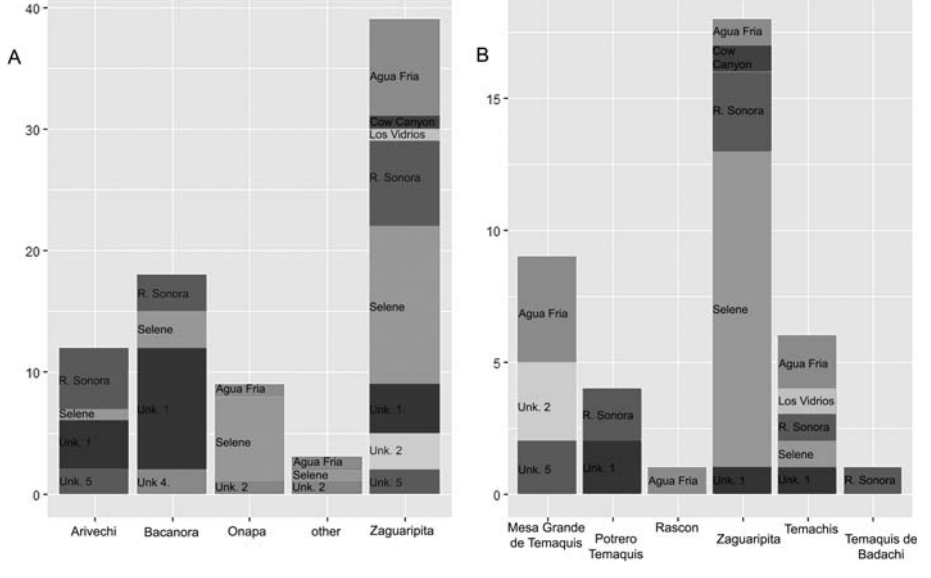

FIGURE 7. Panel A depicts obsidian source frequency by valley reach; panel B depicts obsidian frequency data by site within the Sahuaripa reach.

commensurate with the small number of textured sherds recovered. Overall, the inferred pattern of connectivity suggests Sahuaripa was an important node in regional exchange patterns.

Shell. A total of 217[1] pieces of marine shell were collected across all three seasons of work. Comparing just the material recovered in the last season produces a sherd to shell ratio of 250 to 1, far below many locations more distant from the Sea of Cortez. Like the ceramic assemblage, most shell was highly fragmented, which often precluded identification beyond *bivalve* or *univalve*. The former out-number the later 147 to 41. In terms of forms, there were 61 beads, 36 bracelet fragments, 23 pendants, 1 pectoral, and 78 pieces of debitage. The remaining pieces were unclassified or unmodified pieces. Most beads were relatively small, and thus their predominance should not be overstated. Diverse species were employed for beads including *Olivella, Vermetidae, Chama* and unidentified bivalve nacre. The high representation of bracelets may be overstated, as most were small fragments. *Glycymeris* was the most common taxon for bracelets but *Dosinia* was also used. Pendants were particularly diverse, four *Conus* may be tinklers; other genera include *Theodoxus*, *Oliva*, *Olivella*, *Agropecten*, *Chama*, *Spondylus*, *Pinctada*, and unidentified bivalve nacre. The singular pectoral was made from a *Pinctada mazatlanica*. The taxa of debitage pieces encompasses most of the same range as finished artifact forms. At nearly 40 percent of the classified assemblage, the amount of debitage suggests local manufacture of many pieces.

Though presenting a few widespread commonalities with other regions of the NW/SW in the consumption of species such as *Glycymeris* for bracelets and possibly *Conus* tinklers, the assemblage does not display obvious connections to any defined traditions such as Hohokam or Trincheras. The high diversity of species and forms relative to the size of the assemblage is more consistent with shell jewelry denoting personal aspects of identity as opposed to membership in widespread group identities, as proposed in other portions of the NW/SW (Bayman 2002; McGuire and Howard 1987). Freshwater shell clearly used as ornamentation was recovered only in the Bacanora Valley at Mesa de Los Moros ($n = 10$), suggesting this valley had less access to marine shell and was forced to make do with local alternatives.

Paleobotany. This section will only address those botanical remains found through flotation as summarized by León-Romero (2017) from text excavations in the second season. As botanical studies are relatively rare in the SMO, there are few points of comparison. The number of examined features ($n = 9$) and total amount of soil processed (143l) also is relatively modest. As such, these results are presented as a summary of potentially informative patterns and relationships worthy of further study. Table 3 presents the ubiquity of taxa encountered. In this case, ubiquity is calculated as the percent of tested features in which a taxa was present. The tested features included four *hornos*, a burial, a context under a mano/metate, and three contexts with ash layers or thermal features. The commonality of maize is hardly surprising, but the greater ubiquity of *Cheno-ams* (Chenopodium [e.g. goosefoot] and amaranth), *Portulaca* (e.g. purslanes), and *Spharelcea* (mallows) is interesting. The later has some medicinal uses (Rea 1997) but is not known as a subsistence resource. Some occurrences of these species may be due

TABLE 3.

PALEOBOTANICAL UBIQUITIES (BY FEATURE).

Seeds	Ubiquity
Boerhavia	11.1
Capsicum	11.1
Cheno-ams	77.7
Descurainia	22.2
Leguminosas	33.3
Panicoide	11.1
Portulaca	66.6
Prosopis	11.1
Spharelcea	55.5
Zea mays	44.4
Wood	
Carnegiea	33.3
Havardia	22.2
Olneya	11.1
Pinus	11.1
Populus/Salix	11.1
Prosopis	88.8

to incidental inclusions, but overall, these results reflect a society more invested in the collection of wild plant resources than implied by the earliest colonial descriptions that focus on maize irrigation agriculture.

Several other species are notable for their presence. *Descurainia* (tansymustards) generally prefer elevations above those of the Sahuaripa region's valley settings, possibly indicating intentional transport. Minnis and Whalen (2010:45) note that such naturally piquant foods are not common in NW/SW diets. A *Capsicum* specimen from Rancho Los Zopoquis is notable for the same reason. Approximately two dozen *Capsicum* specimens from the Casas Grandes region (Minnis and Whalen 2010; 2020:43) and one example from a Hohokam context (Miksicek 1987) constitute the entire precolonial record of chile use in the NW/SW. Chile use was much more common in Mesoamerica and is a ubiquitous component of modern diets, so its precolonial rarity is a mystery (Diehl et al. 2021). The identification of this taxon in the Sahuaripa region has the potential to reconfigure our understanding of the geographic extent of precolonial spiced foods.

The analysis of wood fragments in the flotation samples provides a similar mix of expected and noteworthy associations. *Prosopis* is the most common species; mesquite species are well known for their excellent thermal qualities when used as fuel wood and was a favored source of wood in indigenous architecture. The commonness of *Carnegiea* is novel in a regional context. It is commonplace to find burned daub fragments with impressions that match the approximate size of columnar

cactus "ribs". These elements were presumably preferred for their strength and because they present one of the few reliably straight growing forms in the region. The botanical remains thus offer useful support for long suspected relationships. The one *Pinus* specimen is interesting for its recovery at a low valley site (Buenavista). Pine species grow in the surrounding high sierra, but to our knowledge this is the first direct evidence that wood was transported from a mountainous to a valley setting in the SMO.

Summary and Conclusion

Though relatively modest, the data from the Sahuaripa region speak to several important debates regarding the NW/SW. Ethnohistoric documents and minimal ^{14}C data reflect a record of demographic continuity in the valley. Though such observations are commonplace in the SMO, these patterns have yet to be appreciated in most US Southwest literature, which invariably treat the late precolonial record as a time of massive demographic turmoil (Hill et al. 2004; Lekson 2009). A comparative analysis of the factors that facilitated relative continuity from the thirteenth to seventeenth century in the SMO will be the subject of forthcoming research.

Our knowledge of internal organization of Serrana communities remains nascent. Amalgamations above the level of a nuclear household are suggested by the Sahuaripa data. More complex configurations at larger sites with multiple plazas or courtyards hint at multi-level modularity. In most cases, though, social units appear to be of the approximate size of an extended household as denoted by small clusters of continuous architecture. The village is the only other scale of social group that is reliably perceptible. The lack of public architecture suggests larger scales of integration were rare or not reinforced by participation in shared ritual events with obvious material signatures. The ethnohistoric accounts of Sisibotari overseeing 70 settlements, which we have little reason to doubt, are thus hard to reconcile with archaeological data.

In terms of material culture and provenance data, the Sahauripa region appears well connected. Participation in the Sonora Bichrome tradition links this region to Onavas and possibly further afield to groups such as Trincheras and Hohokam. Though minimal, the textured assemblage also reflects connections to northern Río Sonora regions. The presence of cranial modification suggests connections to the Huatabampo region. The architectural styles of the Sahuaripa region are shared throughout the SMO. Ceramic NAA data confirm the importation of Casas Grandes polychromes and indicate Paquimé exerted some degree of social, if not ideological, influence on the region. West Mexican ceramics, or other goods, are notable for their absence. The obsidian data reflect a complex story of involvement in exchange relationships in several directions but with discrete groups in the Sahuaripa region maintaining relative autonomy in fostering extra valley connections. It is notable that one of the clearer connections in the obsidian data (Selene) also suggests exchange with partners that would be intermediaries on a trip to Paquimé.

There are many conflicting models of political economy applied to Northwest Mexico that hinge on the control of rare goods (Di Peso 1974; Carpenter and

Vicente 2009; Kelley 2000; Pailes 1980; Riley 2005). Current data and space are both insufficient for protracted discussion, but we will provide some speculative statements. Regionally obtainable rare materials such as shell and obsidian potentially played a role in local political economies, but do not indicate scenarios of monopolization or anything that approaches highly controlled access. The relevant distributions indicate many individuals potentially competed in the sphere of political economy that circulated these goods, perhaps in a manner akin to "Big-Man" economies or other trans-egalitarian schemas in which material goods were marshalled in pursuit of alliance formation and prestige acquisition through gifting.

The rare foreign goods, such as Casas Grandes ceramics indicate individuals at large population centers had greater access to such items, but overall, our data does not support an elite centric prestige goods economy based on the control of long distance exchange. These sorts of goods were simply too rare to be enmeshed in any sort of common place patronage system. The presence of rare Casas Grandes but not West Mexican ceramics may indicate the identity of actual individual foreign persons in the region. Previous models proposed *pochteca* (itinerant traders) as major movers of rare goods. Religiously motivated pilgrims are another possibility (Mathiowetz 2018; VanPool and VanPool 2007). Our data are not sufficient to parse these alternatives but the unidirectional connections to Casas Grandes provide some weight to the potential for agents traveling through the region on their way to West Mexico but not the inverse. Presumably any West Mexican goods carried on the return trip were too valuable to expend locally.

Our inferences counter some of the motivations previously proposed for long-distance interaction but agree on other points of relational topology and social geography. Based on ethnohistoric references, several scholars argue that important conduits of exchange followed multiple rivers of the SMO (Kelley 2000; Pailes 1990, 1997; Riley 2005). Itinerants coming from Paquimé would likely enter the SMO through tributaries of the Bavispe. Following the main course of this river south would present the Río Sahuaripa as one logical course to continue south before crossing through passes to enter the drainage of the Río Mayo and then the Río Fuerte (Figure 1). Notably Casas Grandes sherds were even rarer in the Yaqui drainage of the Onavas reach (e.g. Gallaga 2013; Garcia-Moreno 2011), suggesting interaction conduits with Paquimé turned south prior to the main course of the Yaqui.

The social geography of the Sahuaripa valley may have been conducive to facilitating interaction. The Ópata—inclusive of Eudeve and Jova—residents of the region spoke a set of related languages shared with their northern neighbors, whereas the lower Río Yaqui (Onavas) was Pima Bajo territory. John Carpenter and Guadalupe Sánchez (2008, 2014) argue Ópata was one link in a continuous chain of closely related languages that stretched the length of the SMO to the West Mexican Cahitan region. This Cahitan connection would serve as a logical conduit through which to orchestrate exchange of both ideas and material. Our data are commensurate with this interpretation. Future research will hopefully clarify patterns of interaction and material exchange in the surrounding regions of Sonora, Chihuahua, and Sinaloa to more fully evaluate these propositions.

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Note

1 Note that many specimens are unidentifiable as to taxon or form, so discussed categorizations will not total to 217.

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