

Spatial and Temporal Limits of the Casas Grandes Tradition: A View from the Fronteras Valley

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This article revises the spatial and temporal boundaries of the Casas Grandes tradition associated with northwest Chihuahua, Mexico, based on new data collected in neighboring northeastern Sonora. The Casas Grandes tradition attained its greatest extent during the Medio period (AD 1200–1450/1500) followed by a dramatic demographic and political collapse. Hunter-gatherer groups subsequently occupied most of northwest Chihuahua. Data from the Fronteras Valley, Sonora, presents an alternative scenario, with a clear pattern of cultural continuity from the eleventh century to the colonial period in which sedentary farmers occupied the same landscapes and occasionally the same villages. These observations contribute to our understanding of the spread and subsequent demise of the Casas Grandes tradition in hinterland regions. For the Fronteras Valley, we infer that immigrant groups originally introduced Casas Grandes traditions and that uneven participation in a suite of shared religious beliefs and practices was common to all the hinterlands.

Keywords: Casas Grandes tradition, Río Sonora tradition, Paquimé, cultural boundaries, migration

El presente artículo revisa los límites temporales y territoriales de la tradición Casas Grandes en el Noroeste de Chihuahua, México, a partir de datos obtenidos recientemente en el vecino Noroeste de Sonora. La tradición Casas Grandes alcanzó su mayor expansión durante el Período Medio (1200-450/1500 dC) seguido de un colapso demográfico y político, siendo esta región y la mayor parte del Noroeste de Sonora, posteriormente reocupada por grupos cazadores-recolectores. Datos obtenidos recientemente en el Valle de Fronteras, Sonora, sugieren un escenario alternativo, el cual muestra claros patrones de continuidad cultural desde el siglo XI hasta el período Colonial, en donde grupos agrícolas continuaron ocupando los mismos paisajes y, ocasionalmente los mismos asentamientos. Estas observaciones contribuyen para mejorar la comprensión acerca de la difusión y posterior dilución de la tradición Casas Grandes en áreas remotas. Para el Valle de Fronteras, creemos que grupos externos/inmigrantes, trajeron consigo tradiciones procedentes de Casas Grandes, en donde la participación desigual, en un conjunto creencias religiosas, favorablemente explica la diversidad de patrones en las áreas remotas.

Palabras clave: tradición Casas Grandes, tradición Río Sonora, Paquimé, fronteras culturales, migración

The primary goals of this article are to extend the spatial limits of the Casas Grandes tradition to the Fronteras Valley (Figure 1) and to propose a modified chronological schema in this subregion (Figure 2). Underpinning these goals is a desire to establish the cultural history of a fiercely debated period and region of the Mexican Northwest/US Southwest (hereafter, NW/SW). The data we present illuminate the nature of Casas Grandes, which is enmeshed in broader discussions over the ultimate sources of power and authority in transegalitarian

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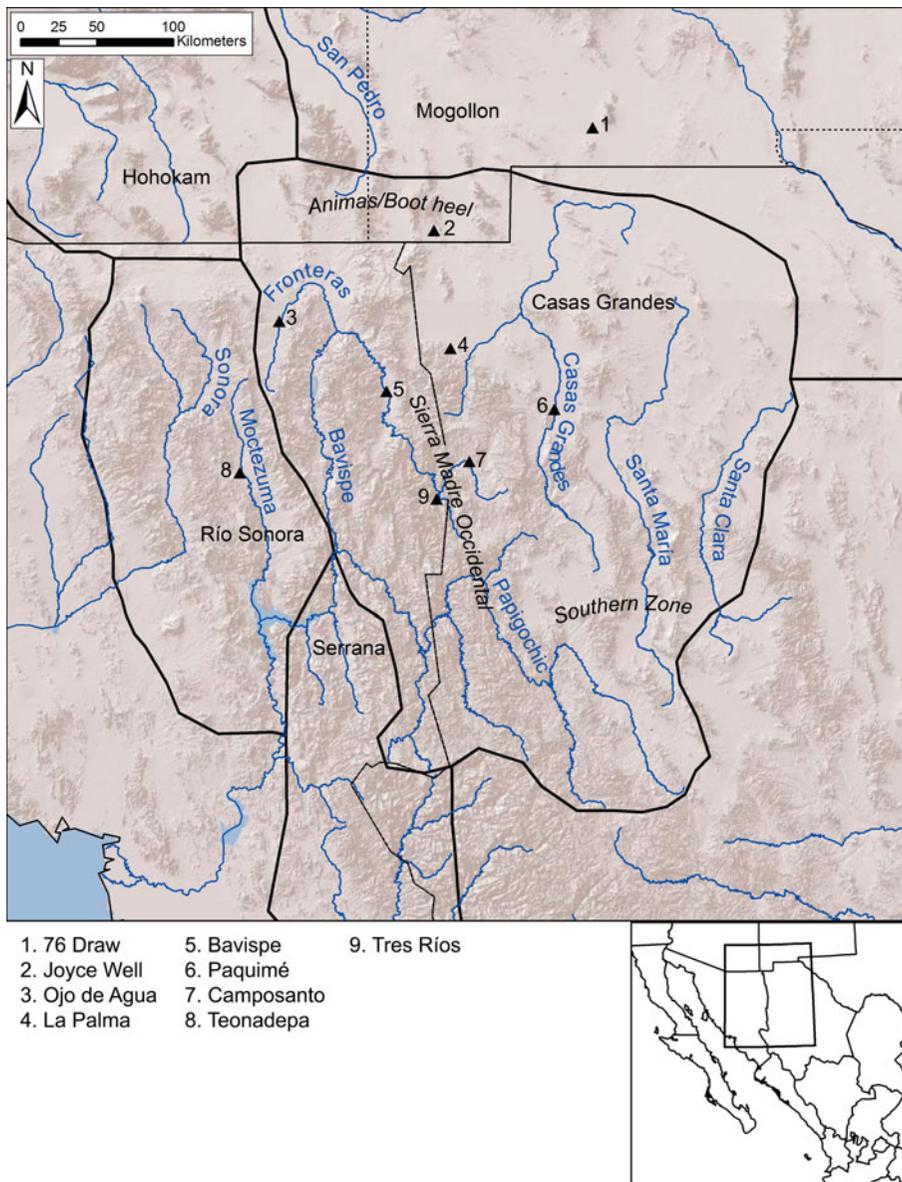


Figure 1. Map of Casas Grandes region.

societies. There are many disagreements about the social organization of the Casas Grandes region and its primary center of Paquimé (Pailes 2017a; Pailes and Searcy 2022). Previous reconstructions offered explanations rooted either in the economics of craft production and long-distance exchange (Di Peso 1974a) or of local subsistence production (Whalen and Minnis 2001a, 2009). Recent research refocuses this conversation on the ideological means used by elites to maintain control over

these material concerns. Alternative models argue for elite-centric ancestor worship (Rakita 2009), the imposition of a foreign religion (Mathiowetz 2018), shamanistic control of esoteric knowledge (VanPool and VanPool 2007), and the development of a “ritual mode of production” to legitimize the expropriation of resources (Cunningham 2017). Emerging from this discussion is a consensus that direct economic and political control by Paquimé’s elites did not extend

Time	Río Sonora (Doolittle 1988)	Río Sonora (Pailles 1973)	Casas Grandes (Whalen & Minnis 2009)	Casas Grandes (Rakita 2009)	Fronteras Valley (this research)
1950					
1900					
1850					
1800					
1750				Apache	
1700					Colonial
1650				S.A.P.	
1600				Spanish Contact	
1550			Post Paquimé		
1500	Above Ground Adobe	Above Ground Adobe		Robles	
1450					
1400			Late Medio	Diablo	
1350		Transition			Fronteras II
1300				Paquimé	
1250	Transition		Early Medio	Buena Fé	
1200		Pithouse			
1150	Pithouse				
1100				Perros Bravos	
1050					
1000					
950					
900					
850		Pre-Mesa	Viejo	Pilon	
800					Fronteras I
750					
700					
650				Convento	
600					?
550					
500					
450					
400					
350					
300					
250					
200					
150					
100					
50					
1/1					

Figure 2. Regional chronological sequences, including a tentative proposal for Fronteras Valley.

far beyond the city's immediate environs but that components of the ideological system were exported across much greater distances. We situate the Fronteras Valley as another case study in Casas Grandes organization that sheds light on how selective elements of the core region's traditions found purchase in the hinterlands.

Another important insight of our data concerns questions of cultural and regional continuity. The descendants of the Casas Grandes tradition are typically ascribed to one of three groups. Most researchers consider the Raramuri to be a descendant community. Di Peso (1974b) suggested that their Sierra Madrean homeland was a refuge for Casas Grandes populations after the collapse of Paquimé. The hunter-gatherer groups who occupied the core of the Casas Grandes region when colonial encounters began, including the Suma and more distantly the Concho (Griffen 1979; Kelley 1990), are another potential descendant community. Third, several researchers suggest that the Ópata are a descendant community (Phillips 1989; Riley 2005:390). This later interpretation argues that the western side of the Sierra Madre Occidental became the demographic and political center of the NW/SW after AD 1450, taking in many Casas Grandes refugees after Paquimé's demise. Our research finds that the Ópata were already living in Sonora during the time of Paquimé and therefore cannot be ascribed predominantly to a post-Paquimé refugee population. Some Ópata clearly participated in the apogee of Casas Grandes traditions from northeastern Sonora. These observations contribute to reconstructions of the widespread demographic reorganization that occurred across the NW/SW in the period after AD 1300.

Casas Grandes and Its Hinterland

A central element of our argument is that the material culture of people living in the Fronteras Valley (Figure 3) reflects aspects of shared identity with that of people living in the core areas of the Casas Grandes region during the Medio period (AD 1200–1450/1500). To make this claim, we must establish what constitutes a baseline of Casas Grandes traditions among hinterland regions. This effort is complicated by the

heterogeneity expressed throughout the Casas Grandes region that reflects differential participation in various traditions most fully enacted at the primary center of Paquimé (Carpenter 2002; Douglas 1995; Douglas and MacWilliams 2015; Kelley and Villalpando 1996). Our discussion begins by summarizing core zone patterns before turning to the established hinterlands of the Southern Zone, the Sierra Madre Occidental, and the Animas/Bootheel regions; other subregions of the NW/SW such as eastern and southeastern Chihuahua also participated to varying degrees in the Casas Grandes tradition but are beyond our purview.

The Core Zone

Extensive excavations by Charles Di Peso and the Joint Casas Grandes Project (Di Peso 1974a) at Paquimé provide the baseline for comparisons to hinterland regions. Relevant material culture traditions include the following: domestic architecture elements such as raised adobe “sleeping” platforms, raised hearths, T-shaped doors, rectilinear rooms with numerous walls in esoteric shapes, and overbuilt (thick) adobe walls; communal architecture features in the form of I- and T-shaped ballcourts and variously shaped platform mounds; “storeroom” concentrations of millions of pieces of shell, hundreds of copper objects, and numerous minerals; distinctive aviculture methods for macaws and turkeys; and an elaborate polychrome tradition. The relative frequency of Ramos polychrome in decorated ceramic assemblages is a particularly valuable indicator of ascription to Paquimé religious traditions. The designs on Ramos polychrome frequently incorporate iconic images of macaws and other symbolically laden elements, and the type was likely made by specialist producers (Woosley and Olinger 1993).

Di Peso (1983) argued that Paquimé was the capital of a mercantile system founded by Mesoamerican itinerant merchants. His claim developed into a world-systems theory perspective in which Paquimé operated as a semi-periphery of Mesoamerica, extracting valuable raw materials in exchange for locally produced rare goods. In subsequent decades, Whalen and Minnis (2001a, 2009) questioned all major points of Di Peso's reconstruction, arguing instead that the

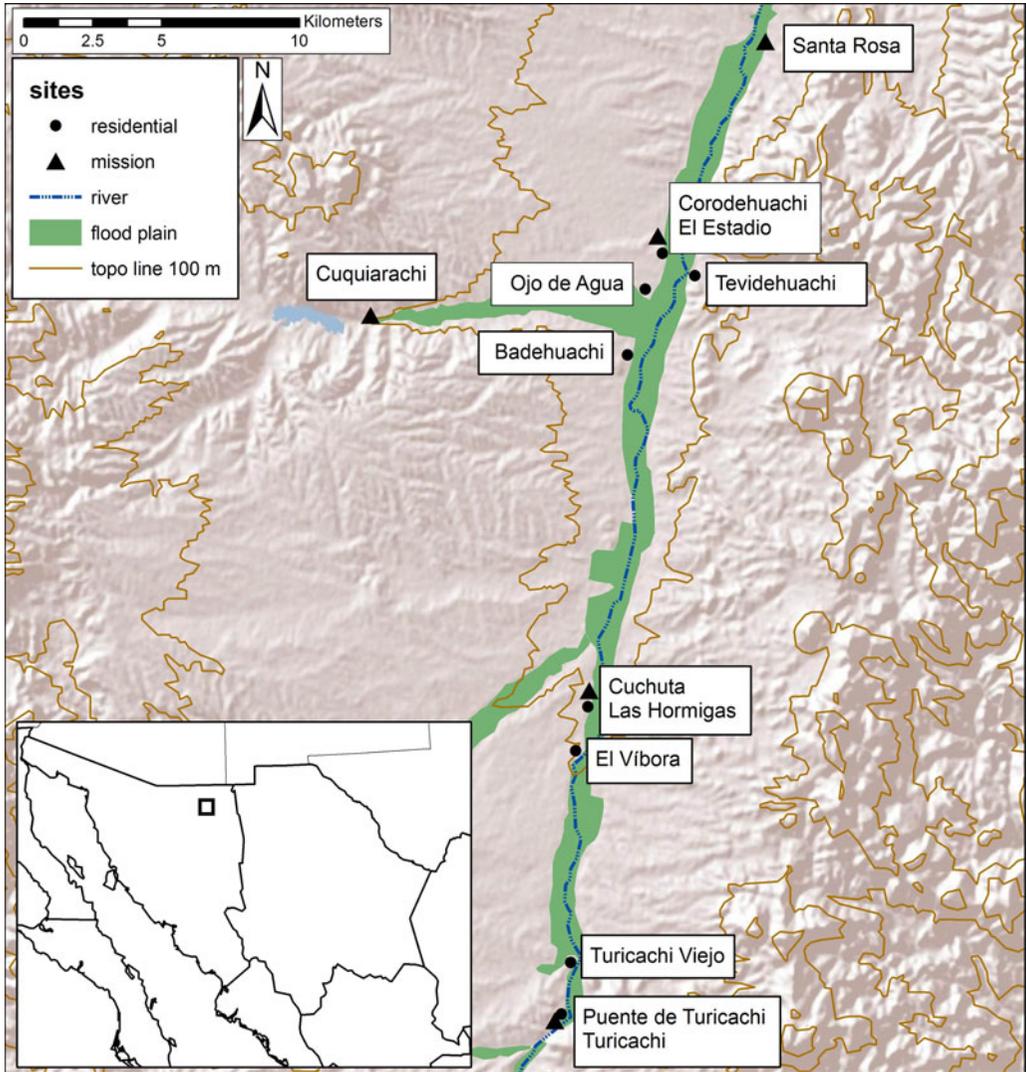


Figure 3. Map of Fronteras Valley.

trajectory of Paquimé reflected peer-polity dynamics. Once Paquimé emerged as a dominant center, it extracted subsistence goods from its hinterland in exchange for rare goods and ideological legitimization. Only the immediate surroundings of Paquimé were under direct political control, and only a modestly larger halo was enmeshed in regular economic exchanges. Revisionist critiques of the Whalen and Minnis model focus on the importance and scale of ideological influence exerted by Paquimé and the role of religion in its founding and maintenance. Although there are significant

differences among active researchers (Lekson 2015; Rakita 2009, 2015; VanPool 2009; VanPool and VanPool 2007, 2015), most infer a greater degree of social complexity, reliance on religion as a mechanism of social control, and greater regional influence than suggested by Whalen and Minnis. For example, Mathiowetz (2018, 2019, 2020) argues not only for Mesoamerican inspiration of the religious traditions of Paquimé but also sustained contact with Mesoamerican agents, including expatriate Mesoamerican rulers. These critiques, however, do not question Whalen and Minnis's empirical

data that demonstrate Paquimé is unmatched by near neighbors or more far-flung hinterland populations in regard to the consumption of rare goods, such as copper, macaws, and marine shell, or labor as indicated in architectural elements.

The Southern Zone

Research by Jane Kelley and colleagues in the Babícora Basin and the upper Santa María and Santa Clara Valleys demonstrates participation in Casas Grandes traditions from the earliest inception of the sequence. Their research focused on the Viejo period (AD 700–1200) but also recorded Medio period sites. These sites lack the architectural grandeur of Paquimé but do reflect basic core-zone construction methods with multiroom adobe pueblos. One early research effort reported T-shaped doorways and platform hearths (Carey 1931) diagnostic of Casas Grandes domestic architecture, but these elements, as well as the distinct overbuilt features of Paquimé, are absent from most sites (Kelley and Phillips 2017:73). Rare goods associated with Paquimé's political economy are also sparse. Researchers report only six or so cage stones, which are associated with macaw aviculture (Kelley and Phillips 2017:62,70; Minnis et al. 1993:272), and two copper bells (Kelley and Phillips 2017:79). Ceramic assemblages include appreciable amounts of Casas Grandes polychrome, but Ramos polychrome is nearly absent (Kelley and Larkin 2017). The Southern Zone also lacks evidence for public architecture, with the exception of one I-shaped ballcourt in the Santa Clara Valley (Kelley and Phillips 2017:75).

Sierra Madre Occidental

Several researchers have investigated the small communities of the foothills and upper elevations of the Sierra Madre Occidental. Naylor (1995) recorded ballcourts in the foothills of northwest Chihuahua at the Camposanto and Las Palmas sites. The former site presents many clear parallels to Casas Grandes domestic architecture. Architectural elements such as T-shaped doorways and distinctive adobe floor platforms are common in cliff sites of the upper Bavispe watershed, but there are also

architectural parallels to non-Casas Grandes traditions (Bagwell 2004). Researchers make generalized inferences of Casas Grandes affiliation for the Papiogochic and other tributaries of the Río Bavispe that stretch into western Chihuahua (Di Peso 1974b; Gamboa Carrera and Mancera Valencia 2008). Many T-shaped doorways are present in these cliff dwellings (Gamboa Carrera and Gutiérrez Vacío 2017), but reported ceramic assemblages rarely include substantial amounts of polychromes (Di Peso et al. 1974a:Figures 243–5, 244–5; Lister 1958:70). Farther west, work at the small open-air-pueblo Bavispe site revealed T-shaped doorways, floor platforms, a modest number of Ramos polychrome sherds, and greater numbers of the Casas Grandes types Carretas and Huerigos (Martínez-Ramírez and Pérez Jaramillo 2013). These areas are apparently completely devoid of the rare goods found at Paquimé.

Animas/Bootheel

Far southwestern New Mexico and southeastern Arizona include several sites with clear Casas Grandes affiliations, most notably Joyce Well, 76 Draw, and Pendleton Ruin. Joyce Well presents the strongest parallels to Paquimé of any hinterland settlement. The site includes an I-shaped ballcourt and a substantial adobe pueblo room block (Skibo and Walker 2002). Architectural features include T-shaped doorways and platform hearths. Ramos polychrome dominates the painted assemblage and was possibly made locally (McCluney 2002). The site of 76 Draw presents many of the same material connections: Casas Grandes polychromes dominate the assemblage but with less abundance of Ramos (Rakita et al. 2011:57). The site may include a low cross-shaped mound similar to a feature at Paquimé (Rakita et al. 2011:43). The limited published data from the 1940s excavations of Pendleton Ruin (Kidder et al. 1949) make comparisons difficult, but the site shows architectural similarities to Paquimé with adobe room blocks, central plazas, and two equivocal T-shaped doorways, as well as a predominance of Ramos polychrome in the small painted assemblage. Rare goods from across this region include an appreciable amount of shell at Joyce Well but no macaws or copper objects.

Implications of Shared Casas Grandes Traditions

A core issue of this discussion hinges on the significance of shared attributes in various classes of material culture and their relevance to shared aspects of identity and ultimately social boundaries (Stark 1998). NW/SW archaeologists often approach the delineation of shared identity through the concept of communities of practice (e.g., Cordell and Habicht-Mauche 2012; Crown 2014; Duwe and Neff 2007; Hegmon et al. 2000; Mills 2004). This perspective wedds insights derived from studies of situated learning (Lave and Wenger 1991; Wenger 1998) to the concepts of technologies of style and *chaînes opératoires* (e.g., Dietler and Herbich 1998; Leroi-Gourhan 1993). One of the central goals of these applications is to explain how socially close individuals come to produce similar material culture. In the NW/SW, this approach has been particularly fruitful in inferring ceramic manufacturing apprenticeship relationships that correspond to social identities shared in migrant communities. We borrow heuristically from this perspective but note that our analysis is applied in data-poor contexts relative to the earlier cited studies and is focused on a broader temporal scale and a more inclusive list of material culture, including ceramic type frequencies, rare goods, and architectural attributes.

We most closely follow Mills (2016) in that we deviate from prior applications by focusing on high-visibility attributes, eschewing a reliance on the low-visibility attributes that reflect routinized aspects of production practices acquired through periods of prolonged situated learning. The low- versus high-visibility distinction shares parallels with other categorizations of style such as active versus passive (Carr 1995) or isochrestic versus iconological (Sackett 1985) but does not overtly specify intentionality (Mills 2016). High-visibility attributes are manifestly apparent in finished forms and thus could be adopted to denote real or aspirational membership in groups that may or may not align with other social boundaries. Reliance on high-visibility attributes entails an implicit shift of focus from shared patterns of production to shared patterns of consumption (Mills 2016), although both would be

implicated in our architectural evidence. The specific architectural attributes and features we discuss are claimed by previous scholars (Bagwell 2004; Cameron 1998; Harmon 2006) to reflect intentional acts of affiliation to denote particular social identities. Painted ceramics in the NW/SW are widely accepted as reflecting overt secular and religious statements of affiliation (e.g., Crown 1994; Gilman et al. 2014; Mathiowetz 2018). The consumption of rare goods also has an obvious potential to indicate shared social identity.

From this succinct review, we can begin to reconstruct the facets of social identity shared across the Casas Grandes region. The Southern Zone clearly participated in the Casas Grandes tradition but does not reflect strong ties with Paquimé during the Medio period. Instead, this region developed in parallel, eschewing many of the ideological changes that occurred coincident with the political and economic florescence of Paquimé (Kelley et al. 2017). This inference is based on a lack of public architecture, Ramos polychrome, and most rare goods. The less symbolically laden Babícora polychrome was common in this region, as were general architectural similarities, but again domestic elements that reflect overt connections such as T-shaped doorways and raised hearths are largely absent. Highly variable and likely aspirational participation in Casas Grandes traditions characterized the small communities of the Sierra Madre Occidental. Public architecture is constrained to lower elevations closer to Paquimé. Yet domestic architecture in the form of T-shaped doorways and floor platforms provides strong evidence for Paquimé emulation. There are few rare goods: these objects obviously cannot be easily replicated and must entail actual social connectivity to facilitate consumption. Casas Grandes polychromes such as Carretas or Huerigos dominate ceramic assemblages, with the symbolically laden Ramos appearing in appreciable numbers in only a few sites. The Animas/Bootheel region provides the clearest evidence for social identities shared with core regions: multiple forms of public architecture, a predominance of Ramos among consumed polychromes, and the use of distinctive domestic architecture embellishments. Evidence of

relevant rare goods consumption is absent, with the exception of shell, which was not necessarily procured through Paquimé. This region may have most faithfully emulated the full suite of Paquimé's ideological traditions. In the next section, we demonstrate that the Fronteras Valley also participates in facets of the identity shared across the Casas Grandes region. In our discussion section, we return to the question of what shared consumption practices imply about social identity in the Casas Grandes region.

Casas Grandes in the Fronteras Region

Connections between the Fronteras Valley and the Casas Grandes tradition were first reported by Sauer and Brand (1931:104). Their survey was followed by Beatriz Braniff's work in 1977, which included stratigraphic tests and partial excavation of one mound of conjoined adobe rooms. Rare goods included one copper bell, with a few more noted in reference to previous regional research (Braniff 1985:364). The excavations produced the only macaw known in Sonora, an *Ara militaris*. No public architecture was found. Based on these reports, our binational team returned to the Fronteras Valley in 2018 (Carpenter et al. 2019) and again in 2021. Initial efforts focused on a targeted pedestrian survey of the western side of the valley and subsequent excavation of domestic contexts. In total, we identified 22 sites ranging in age from the Late Archaic to the Late Historic. Sites dating to Fronteras II (equivalent to the Medio and Tardío periods; see Figure 2) reflected a diverse cultural landscape, presenting characteristics of both Casas Grandes and Río Sonora traditions and a gradation of increasing commitment to Casas Grandes affiliation from south to north. This discussion focuses on the two most thoroughly investigated sites, Ojo de Agua and El Estadio, but also makes references to other sites in the valley (Figure 3).

Ojo de Agua

This site has been heavily disturbed by modern activity, but a relatively well-preserved portion remains along a low sloping terrace. Our investigations focused on excavations of three visible

mounds that rise 0.5–1.5 m above the terrace. In 2018 we focused on the southern mound (Mound 1), exposing a large portion of what may be a room with an eccentric rectilinear form (Figure 4). Surface exposure of walls indicates adjoining rooms to the south and possibly to the west. A doorway was in the exterior eastern wall near its juncture with the northern wall. The walls were notably thick, about 0.5 m, which is substantial for a single-story structure and is near the range associated with an “architecture of power” at Paquimé (Whalen and Minnis 2001b:Table 1). Although it was disturbed, there appeared to be a platform hearth in front of the doorway. Wall heights were not sufficient to evaluate doorway shape. Casas Grandes and textured polychromes were common, including several polychromes clearly in contact with the plastered floor (Table 1). A section of a possible pithouse outline was present in the southwest corner.

In 2021 we focused efforts on Mound 3, which is 55 m to the east–northeast of Mound 1 (Figure 5). This effort exposed approximately two-thirds of a large room. A set of coursed adobe walls built in parallel for a total width of about 60+ cm comprised at least three exterior walls. The floor was plastered but poorly preserved. In the central portion of the room, there were outlines of wall foundations parallel to the long axis of the room, presumably representing earlier architectural configurations. The west end of the room contained a variety of internal features, including adobe platforms and small rooms with low walls. The adobe platforms employ construction elements reminiscent of Paquimé. Features similar to the small low-wall rooms are reported from some Southern Zone sites. No doorways were present, but they may be found in the unexcavated portion of the structure. The overall architectural plan of this mound is not overtly Casas Grandes in character, but the repertoire of elements used in its construction draws heavily from this tradition.

The room contained very few artifacts in the fill and none on the floor, suggesting an organized cessation of use in which materials were removed. The fill was composed of laminated alluvial adobe melt and included Casas Grandes

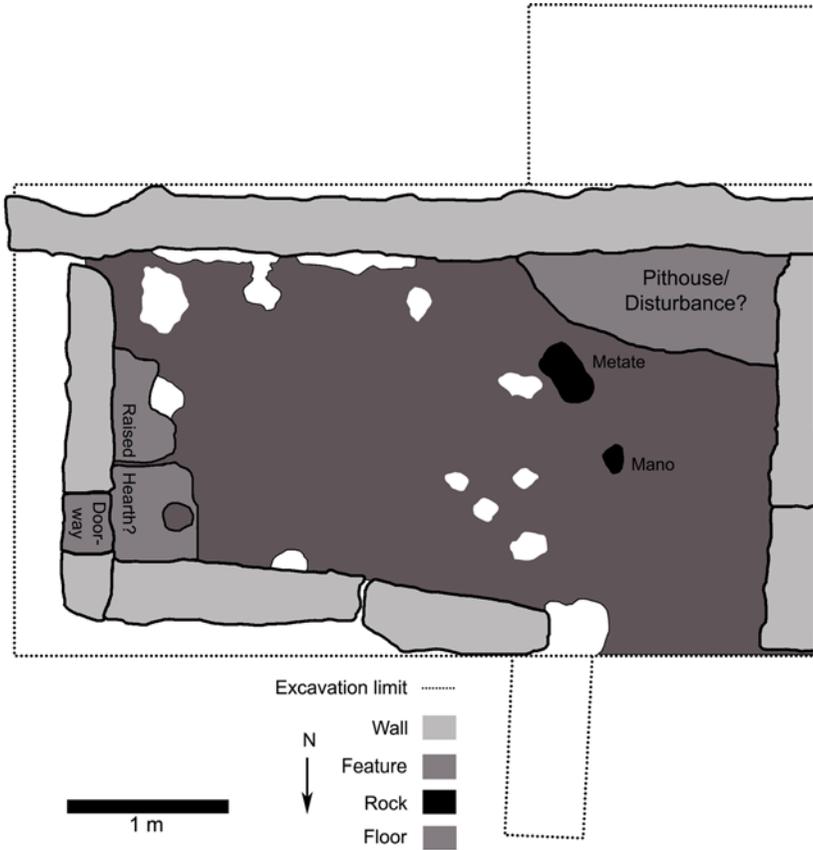


Figure 4. Excavation results from 2018 at Ojo de Agua (photo by Matthew Pailles and map by Edson Cupa and Matthew Pailles).

Table 1. Types and Selected Sub-types as a Percent of the Total Decorated Count.

	Painted all	C.G. Poly.	Ramos	Son. Poly	Textured all	Cloverdale Corr.	Brushed	Total Number of Decorated Sherds	Total Number of Sherds
Ojo de Agua	26.2%	19.6%	3.2%	0.2%	69.6%	41.6%	4.3%	562	3,201
Las Hormigas	16.9%	10.7%	0.7%	0.7%	73.0%	40.7%	10.1%	307	1,972
El Estadio	28.1%	2.9%	0.0%	19.0%	21.0%	3.3%	51.0%	210	2,024
Turicachi Viejo	19.5%	14.2%	0.6%	0.0%	61.7%	32.2%	18.9%	339	1,983

polychromes and textured wares, as well as several majolica sherds. These associations indicate that historic period occupation occurred while the walls of this structure were still partially standing, such that their subsequent erosion entrained the majolica sherds. The ^{14}C date from this context dates the early fill and not the use of the structure (Table 2).

Mound 2 was located 25 m to the north of Mound 3. In 2021, we tested this mound in hopes of discovering another Casas Grandes room block. The immediate discovery of cow bone quickly indicated an historic age to the structure, as did the eventual discovery of several majolica sherds. Given its historic age, we only excavated the initial test trench that revealed the tops of adobe walls and a 2×2 m test unit. A burned floor was revealed in the test unit that produced substantial faunal material. Notably, the walls were formed through the traditional practice of coursed adobe. The proximity to what would have been a visible set of ancestral ruins using the same construction methods suggests that the room block's placement was intended to denote continuity with earlier occupations.

Approximately 2.5 km to the south at the site of Badehuachi, we excavated a test pit into an architectural mound, revealing another historic structure that also included substantial faunal remains and an ash layer on the living surface but with adobe brick walls. A luminescence date from Badehuachi indicates eighteenth-century occupation. Adobe brick architecture was also used in the seventeenth-century presidio (fort) and missions present in the valley. The coursed adobe of Mound 2 presumably represents an overt choice to use Indigenous techniques.

Thirteen historic ceramics were collected at Ojo de Agua in 2021, five from Mound 3 and

eight from Mound 2, including several surface finds. Identifiable specimens include four Puebla Blue on White (AD 1650–1830), one Galera Ware (AD 1725–1850), and one Aranama Polychrome (AD 1750–1850). The Indigenous ceramics from Ojo de Agua include Casas Grandes polychromes and textured wares (Table 1). The most common textured ware is Cloverdale Corrugated, which is common in the Animas region (Douglas 1987). The overall frequency of Casas Grandes wares, particularly Ramos, is low. The Casas Grandes typology is notoriously variable in application (Di Peso et al. 1974a), but it is noteworthy that uncommon attributes such as true glazes and bowls painted on both sides are represented in the sample (Figure 6). These oddities possibly indicate attributes that developed late in the sequence.

El Estadio

Today there is a gap of about 850 m between the excavated mounds of Ojo de Agua and the southernmost mounds that correspond to the proto-colonial architectural features at El Estadio. A test trench in the northern margin of Ojo de Agua indicates that Fronteras II aged deposits continue to the location of proto-colonial occupation. This later occupation is denoted by low architectural mounds located on four distinct mesas created by erosion of the terrace. Our excavations focused on the largest mesa in 2018 and 2021, which includes three distinct mounds and a plaza.

The 2018 effort exposed one entire room and demonstrated conjoined rooms extended to the north and east (Figure 7). Doorways could not be identified due to the low preserved wall height. Fragments of copper sheet, apparently recycled from a colonial origin, were located underneath a river cobble set into the floor. The minimal floor assemblage included two iron

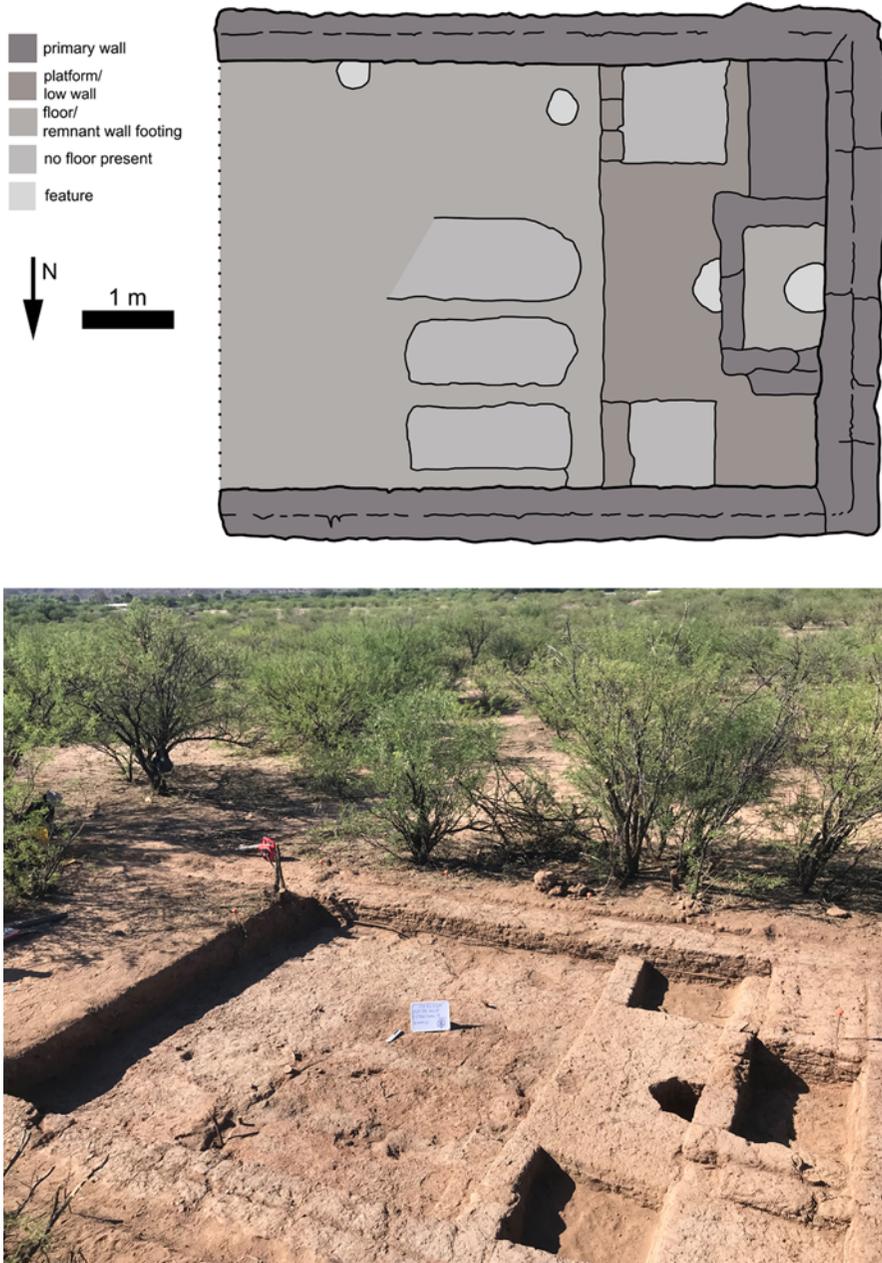


Figure 5. 2021 Excavation results from 2021 at Ojo de Agua (photo by Matthew Pailles and map by Edson Cupa and Matthew Pailles).

artifacts, a large bent nail, and an unidentifiable object. The context of the copper clearly reflects a ritual deposition. A test pit to the immediate east of the excavated room indicated deposits extending at least 70 cm below the floor level. To the north, a test unit revealed many

overlapping wall segments, suggesting frequent remodeling of the structures.

The 2021 effort explored a large mound to the west of the 2018 excavation. An initial trench revealed several walls of coursed adobe that were subsequently exposed, indicating a room

Table 2. Chronometric Dates Obtained from Fronteras Valley with Contextual Information.

Site	Site Type	Context	Lab Number	Material	$\delta^{13}\text{C}$	^{14}C age BP	Implications	% Dec. Sherds: C.G. Poly/Son. Poly/Other Painted/Text./Hist.	Plain/Dec. Sherds
Arroyo de los Hornos	Resource extraction	Horno	AA113668	Charcoal	-25.4	1951 ± 22		No sherds	
El Vibora	Habitation	Midden/sheet trash	AA113684	Charcoal	-25.9	1523 ± 22		All plain	76/0
El Vibora	Habitation	Midden/sheet trash	AA113685	Charcoal	-25.9	1298 ± 22		All plain	76/0
Turicachi Viejo	Habitation	Subfloor burial	AA113669	Bone	-11.4	1236 ± 27	Younger thin-wall adobe structure above and even younger deep midden above structure	0/0/0/100/0	5/1
El Vibora	Habitation	Midden/sheet trash	AA115524	Charcoal	-9.2	1174 ± 21		All plain	65/0
Las Hormigas	Habitation	Subfloor test	AA113680	Charcoal	-24.4	956 ± 22	Younger adobe structure above	19/6/0/75/0	120/16
Las Hormigas	Habitation	Midden	AA115525	Charcoal	-23.3	939 ± 21		4/0/15/81/0	119/26
Las Hormigas	Habitation	Adobe room sub floor test	AA113681	Charcoal	-25.3	798 ± 21	Younger adobe structure above	19/6/0/75/0	120/16
Turicachi Viejo	Habitation	Midden	AA113682	Charcoal	-24.8	678 ± 22	Over 1 m of younger deposits above, older thin-wall adobe structure below	3/0/6/91/0	251/33
Ojo de Agua	Habitation	Feature fill	AA113678	Charcoal	-26.8	664 ± 22	Dated material intrusive into older architecture (pithouse?), overbuilt by adobe structure	No sherds	
Ojo de Agua	Habitation	Adobe room fill	AA113677	charcoal	-11.4	624 ± 22		16/0/9/74/0	1349/188
Arroyo de los Hornos	Resource extraction	Horno	AA113686	Charcoal	-24.8	327 ± 21		No sherds	
Ojo de Agua	Habitation	Midden/ sheet trash	AA113679	Charcoal	-10.7	308 ± 308		All plain	230/0
Ojo de Agua	Habitation	Adobe room fill (mound 3)	AA115526	Charcoal	-25.7	266 ± 21		17/0/5/71/5	660/101
El Estadio	Habitation	Subfloor test	AA113683	Charcoal	-28	142 ± 21		0/25/0/50/25	88/4

(Continued)

Table 2. Chronometric Dates Obtained from Fronteras Valley with Contextual Information.

Site	Site Type	Context	Lab Number	Material	$\delta^{13}\text{C}$	^{14}C age BP	Implications	% Dec. Sherds:		
								C.G. Poly/Son.	Poly/Other	Painted/Text./Hist.
El Estadio	Habitation	Adobe room fill	UW3852	Ceramic Black-on-White	OSL	1.02 ± 0.15	Likely bioturbated, dates structure above	0/0/0/100/0	68/2	
Ojo de Agua	Habitation	Adobe room fill (mound 1)	UW3850	Ceramic, Babicora	OSL/uncorrected TL	0.87 ± 0.09	Likely intrusive, structure younger	16/0/9/74/0	1349/188	
Ojo de Agua	Habitation	Adobe room fill (mound 1)	UW3851	Ceramic, Carretas	OSL/corrected TL	0.56 ± 0.04	Likely intrusive, structure younger	16/0/9/74/0	1349/188	
Badehuachi	Habitation	Adobe brick room, burned floor	UW3853	burned adobe	IRSL (minimum age)	0.30 ± 0.04	Date is termination of occupation	0/0/0/0/100	72/5	

block of seven to nine rooms (Figure 8). Two rooms were excavated completely. Plastered floors were preserved in portions. Several groundstone artifacts and one very well-made biface were in situ on the floor. One internal doorway was plugged with a broken metate. Only the lower portion of the doorways was preserved, but the narrowness of the sealed doorway is commensurate with a T-shape. Several presumed cow bones were present in the fill.

The ceramic assemblage is particularly interesting. Surface collections produced six Casas Grandes and one Mimbres sherd, the latter indicating occupations as early as AD 1000. We denote the most common painted type with the label of Sonoran Polychrome (Figure 6). These sherds have a durable white slip and black geometric designs of mostly parallel lines. White slips are often present on both sides of the sherd, which excludes identification as defined Casas Grandes types. There is, however, a clear similarity to the Casas Grandes tradition, with the closest parallels to Huerigos. Occasionally, small red elements are present, some of which are outlined in black, following the Ramos rule of design (Phillips 2012). Black-line hachure widths are mostly under 2 mm ($n = 36$, mean = 1.5, std = 0.50). This is in the range (<1.4 mm) of diagnostically late Medio (post-AD 1300) Casas Grandes polychromes (Whalen and Minnis 2012). One black-on-white specimen was found on the floor of the 2021 excavation, a clearly proto-colonial context. Examples of Sonoran Polychrome are also known from the Moctezuma Valley, Mexico, predominantly from the site of Teonadepa where luminescence dates indicate use from AD 1300 to the 1500s. SEM analysis of a sample indicated that the black paints are subglazes, similar in composition to Casas Grandes subglazes (Pailles 2017b:86–88). Although Sonoran Polychrome is relatively rare and represented only by sherds, we believe that it reflects the continuation of Casas Grandes traditions into the colonial period.

From the 2018 materials, we selected one small sherd for luminescence dating that we thought was a Sonoran Polychrome based on context. The sherd was quite small, precluding definitive typological identification, and it was

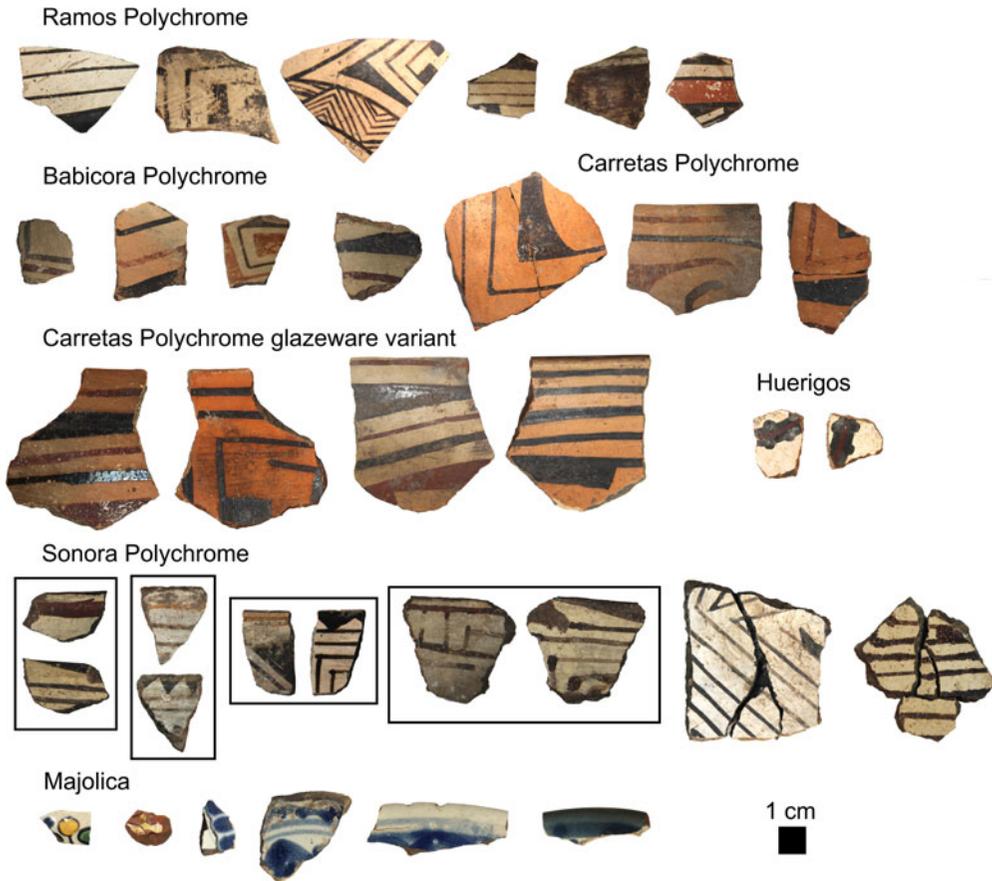


Figure 6. Diagnostic ceramics from the Fronteras Valley (produced from photos by Matthew Pailles). (Color online)

only slipped and painted on the interior. It produced a date of AD 1000 (Table 2), indicating it is, in fact, another type (likely Mimbres or Huerigos). Although not useful for defining the age range of Sonoran Polychrome, this date does indicate a lengthy occupation at the site that is otherwise imperceptible from the surface architecture.

Site Locations

Recorded sites are almost invariably close to the river's edge, a pattern common throughout eastern Sonora (Doolittle 1988). Several sites in the Fronteras Valley are located on lower landforms. This contrasts with the Río Sonora and Serrana regions where sites are located on steep-sided Plio-Pleistocene terraces that rise 10 m or more above the floodplain. A pattern of sites on low first terraces or floodplains is characteristic of

core Casas Grandes traditions. The excavated portion of El Estadio is located on a high terrace about 10 m above the floodplain, but unexcavated loci are found on landforms only 1–2 m in height. Ojo de Agua is located on a gently sloping terrace. The site of Tevidehuachi, on the east side of the valley, occupies a similar landform. Surface collections from this site included Casas Grandes polychromes. Las Hormigas, a tested site with much apparent adobe architecture and Casas Grandes polychromes, is located on a sloping terrace only a few meters above the floodplain. The site of Turicachi Viejo at the southern end of the valley is once again on a landform more than 10 m above the floodplain, which conforms to Río Sonora traditions. There is a gradual transition in site placements from north to south. This gradation of diagnostic landform use parallels changes in

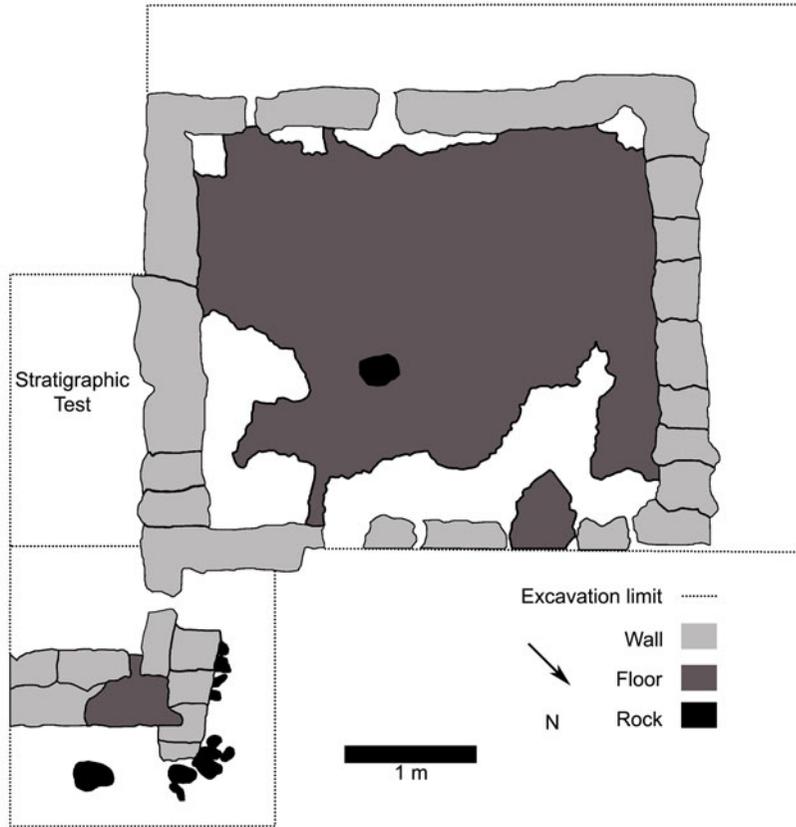


Figure 7. Excavation results from 2018 at El Estadio (photo by Matthew Pailles and map by Edson Cupa and Matthew Pailles).

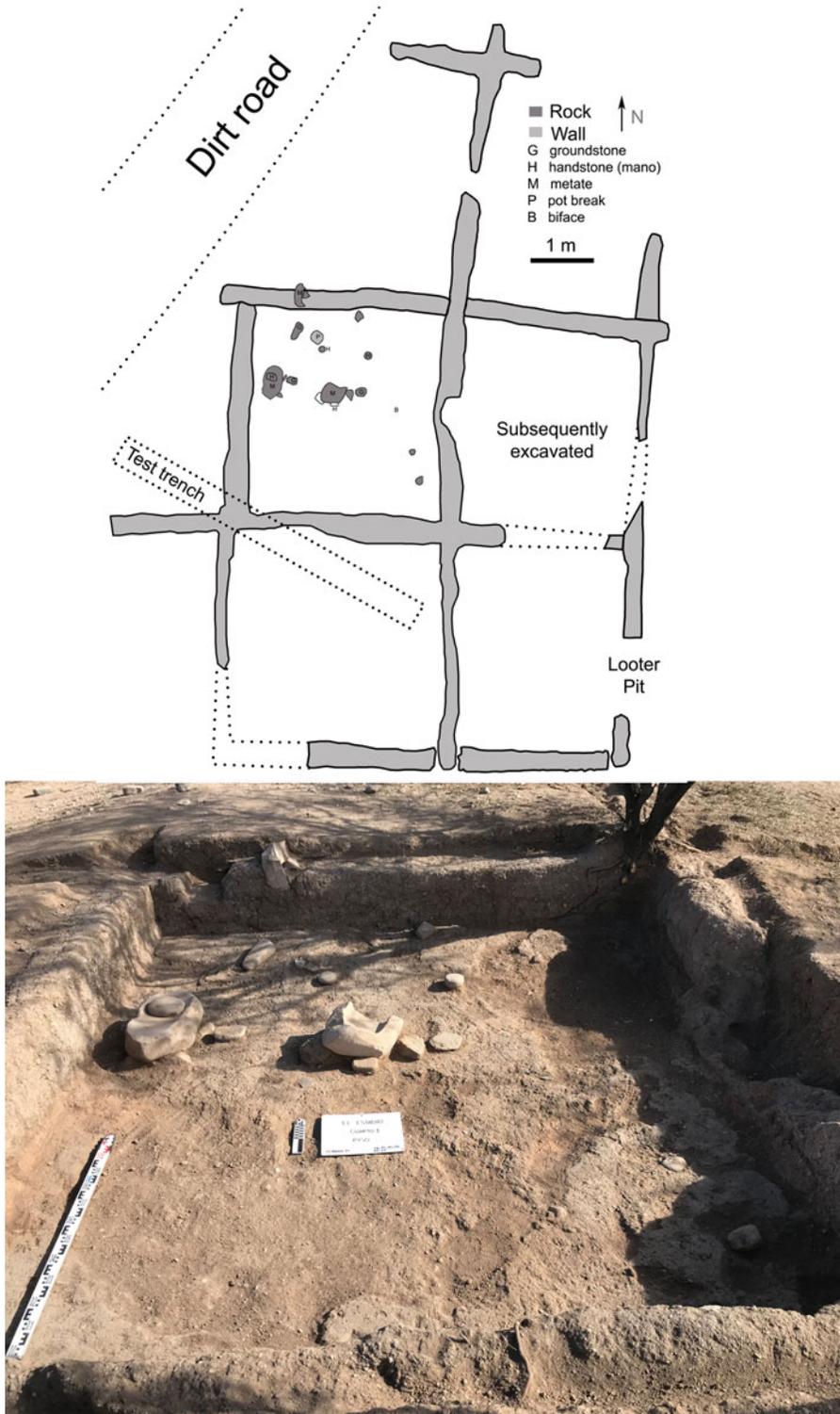


Figure 8. Excavation results from 2021 at El Estadio (photo by Matthew Pailles and map by Edson Cupa and Matthew Pailles).

architectural techniques, with a transition from purely coursed adobe (Casas Grandes) to mostly jacal and thin-walled adobe (Río Sonora) at Turicachi Viejo. The consumption of Casas Grandes ceramics is more variable, with Turicachi Viejo exhibiting slightly more consumption of Casas Grandes types than Las Hormigas (Table 1).

Historic Site Juxtapositions

Accepting the Casas Grandes connections of these sites, we turn to the matter of continuity. The clear spatial juxtaposition of near sequential/partially contemporaneous domestic space at Ojo de Agua makes the case for continuity on a microscale, but it is also apparent at the intersite level. Five mission contexts are present in the valley, four of which were investigated. The site of Cuquiarachi is too disturbed by modern construction for useful comparison. The colonial mission forerunner of modern Fronteras (Corodehuachi) was constructed as a component of a presidio. Archaeological materials are essentially continuous from Ojo de Agua to El Estadio to the presidio, with only intervening arroyo bottoms lacking materials. The mission sites of Cuchuta and Teuricachi provide the clearest contexts in which to explore relationships of continuity. In both cases, mission architecture is located on large mesas with signs of Indigenous habitation immediately adjacent but sequestered to one end of the landform. It was common practice for missionaries to require neophytes to live close to the mission. Large precolonial sites are present immediately adjacent to both mission-site landforms across small arroyos (Figure 3). For Cuchuta, the neighboring site is Las Hormigas; for Turicachi, the neighboring site is La Puente de Turicachi. Las Hormigas was tested in 2018 and 2021 and has clear Casas Grandes affiliations. La Puente de Turicachi was surface-collected in 2018, producing Casas Grandes polychromes and a Mimbres sherd. It is inconceivable that these site pairings are a coincidence. Instead, the consistent relationships suggest an intentional effort to locate mission contexts immediately adjacent to existing population centers, which include exemplar sites for which we can infer Casas Grandes affiliation.

Date Distributions

Figure 9 depicts the distribution of all post-Archaic dates, and Table 2 provides further details on numerical ages and archaeological contexts and associations. Note that some contexts were dated more than once, so some information is repeated. Given the admittedly small sample size ($n=19$) and the vagaries of the radiocarbon curve with wiggles/plateaus at AD 1300–1400 and AD 1500 to the present, we could hardly hope for a clearer record of continuous occupation that aligns with a record of gradual changes in material culture patterns and site placements. Also note that the project avoided ^{14}C dating contexts of proto-colonial age, such as El Estadio, where there is additional clear evidence of continuity. Available data provide no basis for a chronological division equivalent to the Paquimé Medio and Tardío periods denoted by radical demographic and economic realignments. In the Fronteras Valley, the traditions of Fronteras II (Medio-period equivalent) continue well into the colonial period. Figure 2 presents our tentative chronology for the valley. The division between Fronteras I and II is tentative and reflects the earliest dates associated with both Casas Grandes polychromes and Río Sonora textured wares at the site of Las Hormigas. The colonial period begins with the known founding of mission sites.

Di Peso (1974b:832–837) in his original monograph noted the likely continuation of Medio period patterns in the Sierra Madre Occidental region of Tres Ríos, which included one ^{14}C date (Haynes 1966:17) on a post at 300 ± 90 that produces a modern calibration of AD 1434–1696 (74% of distribution). Widespread rejection of Di Peso's dendrochronological sequence, unfortunately, led to a complete dismissal of all his chronometric interpretations, including those not based on tree rings. Our results confirm that components of Casas Grandes identity are still evident at the far northwestern corner of the Sierra Madre Occidental after AD 1450 and likely well after AD 1550; this is likely also true of many highland communities.

Discussion

We now return to the implications of our research outlined in the beginning of the article.

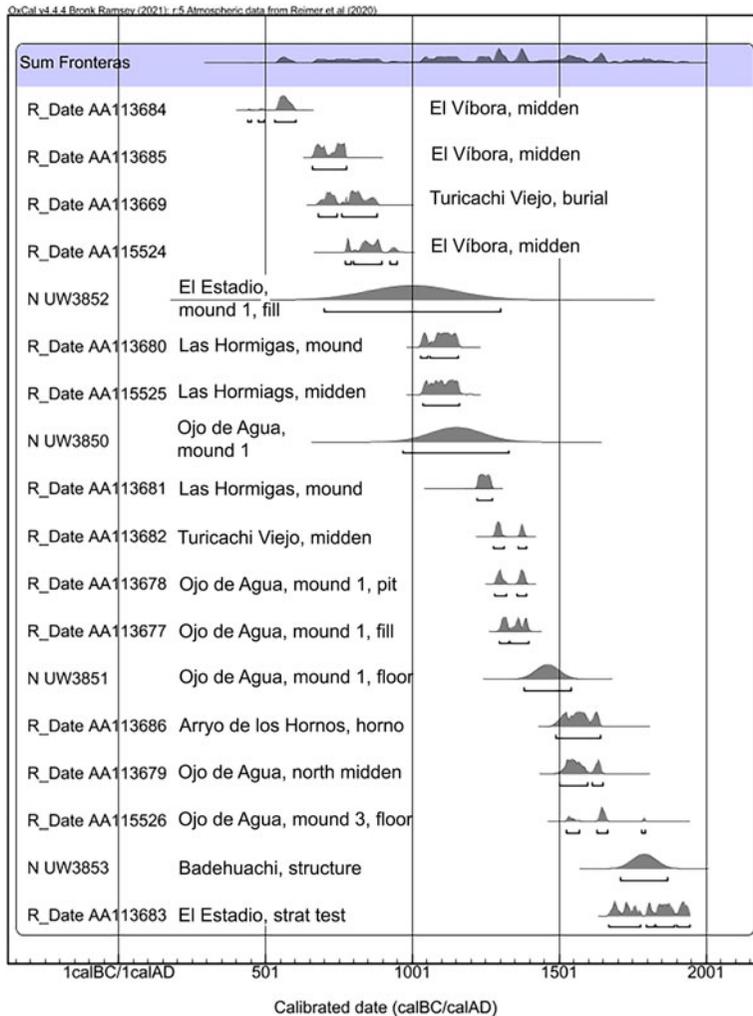


Figure 9. Date distributions obtained from Fronteras Valley; one Archaic date is omitted for clarity.

Regarding cultural affiliation, documentary evidence indicates that multiple groups occupied the Fronteras Valley at the onset of the colonial period. Jocomé are described as resident hunter-gatherer populations (Seymour 2016). Some O'odham groups may have also periodically lived in the valley. The most consistently identified group in historic documents are the Ópata (Yetman 2010), long-term and widespread denizens of the Sierra Madre Occidental. All these groups would have a claim to Casas Grandes affiliation through the Fronteras Valley, with clear historical continuity traceable from Ópata to archaeological antecedents at both settlement and community scales. We do not interpret this

continuity to indicate that Ópata and Casas Grandes are merely temporal divisions in an otherwise distinct ethnicity. This view would ignore the ethnolinguistic diversity that characterized the former Casas Grandes region at contact. The Ópata, for instance, are unlikely to be the predominant descendants of the Casas Grandes people who resided outside the Fronteras Valley and some portions of the western Sierra Madre Occidental. The range of the historic Ópata stretches across three archaeological cultures, and similar arguments for ancestor-descendant continuity are even stronger for the Río Sonora and Serrana regions. It thus seems clear that the Casas Grandes tradition is not coterminous with known historic

ethnicities; ethnicity in general is likely a poor model for precolonial group affiliation (MacEachern 1998).

Elsewhere in the NW/SW, material cultural traditions indicative of shared identities, such as the Hohokam, have been reinterpreted as a form of religious ascription that spanned multiple ethnic groups (Bayman 2002; Fish and Fish 2022; Gumerman 2007). This view cannot be applied directly to the Casas Grandes region. In most hinterland regions, including Fronteras, the religious practices enacted at Paquimé were drawn on only selectively, as indicated by the rarity of Ramos polychrome consumption, minimal public architecture, and very few rare goods. Current reconstructions suggest that Paquimé extracted resources from the immediate hinterland (Cunningham 2017; Whalen and Minnis 2009) through the imposition of an exploitive ideology overseen by potentially foreign leaders (see Lekson 2015; Mathiowetz 2018) who were ultimately found unacceptable by core-region residents (Phillips and Gamboa Carrera 2015:166).

If the basic outline of this amalgamated reconstruction is accurate, it is unsurprising that most hinterlands opted out of the full suite of Paquimé-centric traditions while maintaining components commensurate with hinterland contexts, including more egalitarian and perhaps more archaic aspects of religious belief. The traditions that were more faithfully replicated in the hinterlands include domestic architectural features and the consumption of polychromes, with fewer iconic elements and some amount of lower-value rare goods (shell) consumption. This suite of elements may reflect household-level ritual activity and more secular aspects of identity. The hinterlands potentially channeled much of their ritual energy into pilgrimages to Paquimé (Fish and Fish 1999) while eschewing local community-scale ritual activities. Several features at Paquimé are designed to host large numbers of devotees, including exceptionally large agave ovens and an abundance of public ritual architecture (VanPool and VanPool 2018:310–311, 2020:123). This view posits the spatial compartmentalization of ritual consumption practices at the landscape scale, explaining the obvious Casas Grandes affiliation of the hinterlands,

despite their lack of Paquimé's most impressive attributes.

A related question is how Casas Grandes affiliations were first established in the Fronteras Valley. Three nonexclusive options are (1) parallel development from a shared ancestral tradition, (2) adoption of Casas Grandes traditions by previously unrelated groups, and (3) the actual movement of Casas Grandes people into the valley. Taking the strongest case for affiliation at Ojo de Agua, the striking similarity of architectural construction techniques and the juxtaposition of distinctive Casas Grandes elements suggest the presence of builders fully enmeshed in communities of practice, such that domestic architecture incorporates both high- and low-visibility attributes. These same architectural attributes, as well as rare glaze paint pottery production, were carried forward into the early colonial period after Paquimé itself was long since abandoned. This faithful adoption and persistence would seem unlikely to develop through the casual copying of forms based on limited exposure. It is noteworthy that the one tested Fronteras I site (El Víbora) evidences few parallels to the Casas Grandes Valley's Viejo period, suggesting these affiliations were strengthened relatively late in time, as they were elsewhere in the Sierra Madre Occidental (Douglas and Quijada 2004).

Our preferred scenario is that actual Casas Grandes peoples entered the Fronteras Valley at the beginning of what we designate as Fronteras II. Regional migrations were common in the late precolonial NW/SW. For example, isotopic work at Paquimé suggests upward of 30% of the population was not immediately local, and nearly 10% originated from significant distances (Offenbecker 2018:78). We suspect that multiple household-level units of Casas Grandes origin made the decision to settle in the Fronteras Valley. Some of these households were integrated into existing population centers, whereas others expressed a greater degree of homophily and created communities such as Ojo de Agua that approximated site-level intrusions. This household-unit model would be in opposition to any reconstruction that suggests politically directed colonization efforts, such as that imagined by Di Peso (1974b) for other portions of

the Sierra Madre Occidental. The continual, if rare, consumption of polychrome ceramics and rare goods suggests that the physical movement of peoples continued after initial migration, possibly through pilgrimage activity as outlined earlier. This continual contact presumably facilitated the synchronization of social identities long after initial migration events.

A last point to be addressed is the Fronteras Valley's anomalous demographic and cultural resilience relative to other portions of the Casas Grandes region (Hill et al. 2004; Ingram and Shelby 2021). At present we can offer only the outline of a materialist perspective that undoubtedly lacks nuance. Site densities in the Fronteras Valley appear far below those of most Casas Grandes or Río Sonora settings (Pailes 2015). The distance between large sites suggests little potential or need for coordination between population centers in subsistence infrastructure such as irrigation networks. Overall, the data suggest that the valley was more labor poor than resource poor relative to surrounding subregions. Labor-poor frontier contexts often foment fluid social contracts and lower levels of inequality. This scenario would obviate the need for the sorts of complex managerial systems co-opted by would-be elites (Earle 1997; Hayden and Villeneuve 2010) and reinforces why the elite-centered ideologies of Paquimé found little direct purchase in the Fronteras Valley. A future discussion will take up the issue of comparative demographic trajectories at a regional scale. In addition to low-population density, we suspect that high village autonomy and the high cultural diversity of the Fronteras Valley are important factors in explaining resilience to both environmental variance and social tumult, including that induced by colonial invasions.

Conclusion

The Casas Grandes tradition is best known from the developmental sequence of the core zone in northwest Chihuahua. Previous research demonstrates that elements of the post-AD 1200

Medio period pattern were exported to, adopted by various hinterland populations, or both. We verify that this is also true of the Fronteras Valley on the northwestern fringe of the Sierra Madre Occidental. In contrast to the core regions around Paquimé, there is a clear record of continuity between these Casas Grandes-affiliated peoples and protohistoric groups, most clearly the Ópata, who are widely accepted as the predominant sedentary group in the valley in the 1600s. Despite this continuity, we avoid equating Casas Grandes with an ethnic identity. We suspect that Casas Grandes represented a fluid set of religious ideals and practices tethered to the prestige of Paquimé but lacking any obligate ideology. Additionally, ritual practices of consumption were compartmentalized at the landscape scale, such that much of the unique material richness of Paquimé should not be expected in hinterland contexts. As outlined by previous scholars, pilgrimages provide a plausible means by which a large segment of the regional population could partake directly in the religious practices of Paquimé. Household-based ritual and secular activities of Casas Grandes derivation are directly indicated in the consumption practices of hinterlands populations.

We infer that the most likely scenario for the original incorporation of the Fronteras Valley into the Casas Grandes region took place through a mix of site-level intrusions (Ojo de Agua) in concert with diffuse incorporation of Casas Grandes peoples into existing settlements. Individual family units are the most likely scale of social unit that made decisions to migrate, as opposed to any sort of intentional colonization directed by larger political units. An issue worthy of further study is the differential incorporation of Casas Grandes traits by various hinterland groups and their persistence into the proto-colonial period. After Paquimé's dissolution, Fronteras Valley residents maintained traditions reflective of Casas Grandes identity through the continued production or importation of existing polychrome styles and the development of Sonoran Polychrome. Casas Grandes architectural practices were also retained well after colonial invasion in the form of coursed adobe architecture and occasional internal domestic features.

There is room to add substantial nuance to our understanding of these patterns of affiliation and a

need to address the central question of what was so attractive about Casas Grandes, given that much of the Paquimé-centric ideology was not adopted in the hinterlands. More research is also needed to address what aspects of sociopolitical organization or ecology facilitated the differential demographic and cultural persistence of the Fronteras Valley relative to other portions of the Casas Grandes region. The answer to these questions will necessitate a larger consideration of the diverse Sierra Madre Occidental communities, which together represent a major center of demographic resilience in the otherwise tumultuous twelfth to seventeenth centuries. This article focused on the building blocks of culture history, and these observations are intended as a jumping-off point for further studies.

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Competing Interests. The authors declare none.

References Cited

- Bagwell, Elizabeth A.
2004 Architectural Patterns along the Río Taraises, Northern Sierra Madre Occidental, Sonora. *Kiva* 70:7–30.
- Bayman, James M.
2002 Hohokam Craft Economies and the Materialization of Power. *Journal of Archaeological Method and Theory* 9:69–95.
- Braniff, Beatriz C.
1985 La Frontera protohistórica Pima-Ópata en Sonora, México: Proposiciones arqueológicas preliminares: Tomo II. PhD dissertation, Anthropology, Instituto Nacional de Antropología e Historia, Mexico City.
- Cameron, Catherine M.
1998 Coursed Adobe Architecture, Style, and Social Boundaries in the American Southwest. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 183–207. Smithsonian Institution, Washington, DC.
- Carey, Henry A.
1931 An Analysis of Northwestern Chihuahua Culture. *American Anthropologist* 33:325–374.
- Carpenter, John Philip
2002 The Animas Phase and Paquimé: Regional Differentiation and Integration at Joyce Well. In *The Joyce Well Site: On the Frontier of the Casas Grandes World*, edited by James M. Skibo, Eugene B. McCluney, and William H. Walker, pp. 149–166. University of Utah Press, Salt Lake City.
- Carpenter, John Philip, Matthew C. Pailles, and Guadalupe Sánchez
2019 *Informe de las investigaciones realizadas en el proyecto Sahuaripa y la Sierra Central de Sonora 2017–2018*. Report submitted to the Consejo de Arqueología-INAH para su evaluación Sesión 1, January 31, 2019. INAH Sonora, Hermosillo, Sonora, Mexico.
- Carr, Christopher
1995 A Unified Theory of Artifact Design. In *Style, Society, and Person: Archaeological and Ethnological Perspectives*, edited by Christopher Carr and Jill E. Neitzel, pp. 171–258. Plenum, New York.
- Cordell, Linda S., and Judith A. Habicht-Mauche (editors)
2012 *Potters and Communities of Practice: Glaze Paint and Polychrome Pottery in the American Southwest, AD 1250–1700*. Anthropological Papers of the University of Arizona No. 75. University of Arizona Press, Tucson.
- Crown, Patricia L.
1994 *Ceramics and Ideology: Salado Polychrome Pottery*. University of New Mexico Press, Albuquerque.
- 2014 The Archaeology of Crafts Learning: Becoming a Potter in the Puebloan Southwest. *Annual Review of Anthropology* 43:71–88.
- Cunningham, Jeremy J.
2017 Ritual Modes of Production in the Casas Grandes Social Field. In *Modes of Production and Archaeology*, edited by Robert M. Rosenwig and Jeremy J. Cunningham, pp. 174–206. University Press of Florida, Gainesville.
- Dietler, Michael D., and Ingrid Herbich
1998 Habitus, Techniques, Style: An Integrated Approach to the Social Understanding of Material Culture and Boundaries. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 232–263. Smithsonian Institution, Washington, DC.
- Di Peso, Charles C.
1974a *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca: Medio Period*, Vol. 2. Northland Press, Flagstaff, Arizona.
1974b *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca: Tardío and Españoles Periods*, Vol. 3. Northland Press, Flagstaff, Arizona.
1983 The Northern Sector of the Mesoamerican World System. In *Forgotten Places and Things: Archaeological Perspectives on American History*, edited by Albert E. Ward, pp. 11–22. Center for Anthropological Studies, Albuquerque, New Mexico.
- Di Peso, Charles C., John B. Rinaldo, and Gloria J. Fenner
1974a *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca: Ceramics and Shell*, Vol. 6. Northland Press, Flagstaff, Arizona.
1974b *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca: Architecture*, Vol. 5. Northland Press, Flagstaff, Arizona.
- Doolittle, William E.
1988 *Pre-Hispanic Occupance in the Valley of Sonora, Mexico: Archaeological Confirmation of Early Spanish Reports*. Anthropological Papers of the University of Arizona No. 48. University of Arizona Press, Tucson.
- Douglas, John E.
1987 Late Prehistoric Archaeological Remains in the San Bernardino Valley, Southeastern Arizona. *Kiva* 53:35–51.

- 1995 Autonomy and Regional Systems in the Late Prehistoric Southern Southwest. *American Antiquity* 60:240–257.
- Douglas, John E., and Arthur C. MacWilliams
2015 Society and Polity in the Wider Casas Grandes Region. In *Ancient Paquimé and the Casas Grandes World*, edited by Paul E. Minnis and Michael E. Whalen, pp. 126–147. University of Arizona Press, Tucson.
- Douglas, John E., and César A. Quijada
2004 Between the Casas Grandes and the Río Sonora Valleys: Chronology and Settlement in the Upper Bavispe Drainage. In *Surveying the Archaeology of Northwest Mexico*, edited by Gillian E. Newell and Emiliano Gallaga, pp. 93–109. University of Utah Press, Salt Lake City.
- Duwe, Samuel, and Hector Neff
2007 Glaze Pigment Analyses of Pueblo IV Period Ceramics from East-Central Arizona Using Time of Flight-Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (TOF-LA-ICPMS). *Journal of Archaeological Science* 34:404–414.
- Earle, Timothy K.
1997 *How Chiefs Come to Power: The Political Economy in Prehistory*. Stanford University Press, Stanford, California.
- Fish, Paul R., and Suzanne K. Fish
1999 Reflections on the Casas Grandes Regional System from the Northwestern Periphery. In *The Casas Grandes World*, edited by Curtis F. Schaafsma and Carroll L. Riley, pp. 27–42. University of Utah Press, Salt Lake City.
- Fish, Suzanne K., and Paul R. Fish
2022 Multi-Ethnic Dimensions of Agriculture in Hohokam Society. In *Borderlands Histories: Ethnographic Observations and Archaeological Interpretations*, edited by John Philip Carpenter and Matthew C. Pailles, pp. 111–134. University of Utah Press, Salt Lake City.
- Gamboa Carrera, Eduardo, and Fátima Gutiérrez Vacío
2017 Las casas acantilado de La Sierra Madre Occidental en Chihuahua, México. In *La Cultura Casas Grandes*, edited by Rafael Cruz-Antillón and Timothy D. Maxwell, pp. 199–209. Secretaría de Cultura de Chihuahua, Chihuahua, Mexico.
- Gamboa Carrera, Eduardo, and Federico J. Mancera Valencia
2008 The Cultural Landscape of Cliff Houses in the Sierra Madre Occidental, Chihuahua. In *Archaeology without Borders: Contact, Commerce, and Change in the U.S. Southwest and Northwestern Mexico*, edited by Laurie D. Webster, Maxine E. McBrinn, and Eduardo Gamboa Carrera, pp. 355–364. University Press of Colorado, Boulder.
- Gilman, Patricia A., Marc Thompson, and Kristina Wyckoff
2014 Ritual Change and the Distant: Mesoamerican Iconography, Scarlet Macaws, and Great Kivas in the Mimbres Region of Southwestern New Mexico. *American Antiquity* 79:90–107.
- Griffen, William B.
1979 *Indian Assimilation in the Franciscan Area of Nueva Vizcaya*. Anthropological Papers of the University of Arizona No. 33. University of Arizona Press, Tucson.
- Gumerman, George J.
2007 The Hohokam: The Who and the Why. In *The Hohokam Millennium*, edited by Suzanne K. Fish and Paul R. Fish, pp. 141–146. School for Advanced Research, Santa Fe, New Mexico.
- Harmon, Marcel J.
2006 Religion and the Mesoamerican Ball Game in the Casas Grandes Region of Northern Mexico. In *Religion in the Prehispanic Southwest*, edited by Christine S. VanPool, Todd L. VanPool, and David A. Phillips Jr., pp. 185–217. Alta Mira Press, Lanham, Maryland.
- Hayden, Brian, and Suzanne Villeneuve
2010 Who Benefits from Complexity? A View from Futuna. In *Pathways to Power: New Perspectives on the Emergence of Social Inequality*, edited by Douglas T. Price and Gary M. Feinman, pp. 95–145. Springer, New York.
- Haynes, C. Vance, Jr.
1966 Arizona Radiocarbon Dates VI*. *Radiocarbon* 8:1–21.
- Hegmon, Michelle, Margaret C. Nelson, and Mark J. Ennes
2000 Corrugated Pottery, Technological Style, and Population Movement in the Mimbres Region of the American Southwest. *Journal of Anthropological Research* 56:217–240.
- Hill, Brett J., Jeffery J. Clark, William H. Doelle, and Patrick D. Lyons
2004 Prehistoric Demography in the Southwest: Migration, Coalescence, and Hohokam Population Decline. *American Antiquity* 69:689–716.
- Ingram, Scott E., and Patrick M. Shelby
2021 Human Securities, Sustainability, and Migration in the Ancient U.S. Southwest and Mexican Northwest. *Ecology and Society* 26(2):9. DOI:10.5751/ES-12312-260209.
- Kelley, J. Charles
1990 The Rio Conchos Drainage: History, Archaeology, Significance. *Journal of Big Bend Studies* 2:29–41.
- Kelley, Jane H., and Karin Burd Larkin
2017 Pottery Studies. In *Not so Far from Paquimé: Essays on the Archaeology of Chihuahua, Mexico*, edited by Jane H. Kelley and David A. Phillips Jr., pp. 99–119. University of Utah Press, Salt Lake City.
- Kelley, Jane H., and David A. Phillips Jr.
2017 Medio Period Sites in the Southern Zone. In *Not so Far from Paquimé: Essays on the Archaeology of Chihuahua, Mexico*, edited by Jane H. Kelley and David A. Phillips Jr., pp. 54–80. University of Utah Press, Salt Lake City.
- Kelley, Jane H., Joe D. Stewart, Richard D. Garvin, and David A. Phillips Jr.
2017 Thoughts on the Southern Zone. In *Not so Far from Paquimé: Essays on the Archaeology of Chihuahua, Mexico*, edited by Jane H. Kelley and David A. Phillips Jr., pp. 166–175. University of Utah Press, Salt Lake City.
- Kelley, Jane H., and María Elisa Villalpando
1996 An Overview of the Mexican Northwest. In *Interpreting Southwest Diversity: Underlying Principles and Overarching Patterns*, edited by Paul R. Fish and J. J. Reid, pp. 69–80. Anthropological Research Papers No. 48. Arizona State University, Tempe.
- Kidder, A. V., H. S. Cosgrove, and C. B. Cosgrove
1949 *The Pendleton Ruin, Hidalgo County, New Mexico*. Contributions to American Anthropology and History Vol. 10, No. 50. Carnegie Institution of Washington, Washington, DC.
- Lave, Jean, and Etienne Wenger
1991 *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press, Cambridge.
- Lekson, Stephen H.
2015 *The Chaco Meridian: One Thousand Years of*

- Political and Religious Power in the Ancient Southwest*. 2nd ed. Rowman & Littlefield, Lanham, Maryland.
- Leroi-Gourhan, Andre
1993 *Gesture and Speech*. Translated by A. Berger. MIT Press, Cambridge, Massachusetts.
- Lister, Robert H.
1958 *Archaeological Excavations in the Northern Sierra Madre Occidental, Chihuahua and Sonora, Mexico*. Series in Anthropology No. 7. University of Colorado Press, Boulder.
- MacEachern, Scott
1998 Scale, Style, and Cultural Variation: Technological Traditions in the Northern Mandara Mountains. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 107–131. Smithsonian Institution, Washington, DC.
- Martínez-Ramírez, Júpiter, and Claudia Pérez Jaramillo
2013 Proyecto Arqueológico Sierra Alta de Sonora: Tercera temporada 2013 Sitio: Bavispe Chih:C:9:4, Análisis de materiales y propuesta de la temporada de campo 2014. Submitted to Centro INAH Sonora, Hermosillo, Mexico.
- Mathiowetz, Michael Dean
2018 The Sun Youth of the Casas Grandes Culture, Chihuahua, Mexico (AD 1200–1450). *Kiva* 84:367–390.
2019 A History of Cacao in West Mexico: Implications for Mesoamerica and US Southwest Connections. *Journal of Archaeological Research* 27:287–333.
2020 El hijo dios que está en el sol: Autoridad política y personificación del dios sol en el antiguo Noroccidente de México. In *Aztatlán: Interacción y cambio social en el occidente de México ca. 850–1350 d.C.*, edited by Laura Solar-Valverde and Ben A. Nelson, pp. 287–312. El Colegio de Michoacán, Zamora, Michoacán, Mexico.
- McCluney, Eugene B.
2002 The 1963 Excavation. In *The Joyce Well Site*, edited by James M. Skibo, Eugene B. McCluney, and William H. Walker, pp. 11–97. University of Utah Press, Salt Lake City.
- Mills, Barbara J. (editor)
2004 *Identity, Feasting, and the Archaeology of the Greater Southwest: Proceedings of the 2002 Southwest Symposium*. University Press of Colorado, Boulder.
- Mills, Barbara J.
2016 Communities of Consumption: Cuisines as Constellated Networks of Situated Practice. In *Knowledge in Motion: Constellations of Learning across Time and Place*, edited by Andrew P. Roddick and Ann Brower Stahl, pp. 247–270. University of Arizona Press, Tucson.
- Minnis, Paul E., Michael E. Whalen, Jane H. Kelley, and Joe D. Stewart
1993 Macaw Breeding in the North American Southwest. *American Antiquity* 58:270–276.
- Naylor, Thomas H.
1995 Casas Grandes Outlier Ball Courts in Northwest Chihuahua. In *The Gran Chichimeca: Essays on the Archaeology and History of Northern Mesoamerica*, edited by Jonathan E. Reyman, pp. 224–239. Ashgate, Brookfield, Wisconsin.
- Offenbecker, Adrienne M.
2018 Geographic Origins, Status, and Identity at Paquimé, Northwest Chihuahua, Mexico. PhD dissertation, Graduate Program in Archaeology, University of Calgary, Calgary. Proquest (ATT 10984850).
- Pailes, Mathew C.
2015 The Political Landscapes of Eastern Sonora, Mexico: A Reconsideration of Scale and Organization. *Latin American Antiquity* 26:530–549.
- 2017a Northwest Mexico: The Prehistory of Sonora, Chihuahua, and Neighboring Areas. *Journal of Archaeological Research* 25:373–420.
2017b *Archaeology of the Sierra Madre Occidental: Research in the Moctezuma Valley of Eastern Sonora, Mexico*. Archaeological Series No. 212. Arizona State Museum, University of Arizona, Tucson.
- Pailes, Matthew C., and Michael T. Searcy
2022 *Hinterlands to Cities: The Archaeology of Northwest Mexico and Its Vecinos*. Society for American Archaeology, Washington, DC.
- Pailes, Richard A.
1973 An Archaeological Reconnaissance of Southern Sonora and Reconsideration of the Rio Sonora Culture. PhD Dissertation, Department of Anthropology, Southern Illinois University, Carbondale. Proquest (ATT 7323708).
- Phillips, David A., Jr.
1989 Prehistory of Chihuahua and Sonora, Mexico. *Journal of World Prehistory* 3:373–401.
2012 The Northwest Mexican Polychrome Traditions. In *Potters and Communities of Practice: Glaze Paint and Polychrome Pottery in the American Southwest, A.D. 1250–1700*, edited by Linda S. Cordell and Judith A. Habicht-Mauche, pp. 34–44. Anthropological Papers of the University of Arizona No. 75. University of Arizona Press, Tucson.
- Phillips, David A., Jr., and Eduardo Gamboa Carrera
2015 The End of Paquimé and the Casas Grandes Culture. In *Ancient Paquimé and the Casas Grandes World*, edited by Paul E. Minnis and Michael E. Whalen, pp. 148–171. University of Arizona Press, Tucson.
- Rakita, Gordon F. M.
2009 *Ancestors and Elites: Emergent Complexity and Ritual Practices in the Casas Grandes Polity*. AltaMira Press, Walnut Creek, California.
2015 Organization of Production at Paquimé. In *Ancient Paquimé and the Casas Grandes World*, edited by Paul E. Minnis and Michael E. Whalen, pp. 58–82. University of Arizona Press, Tucson.
- Rakita, Gordon F. M., Christine S. VanPool, Todd L. VanPool, and Sarah Sterling
2011 An Introduction of the 76 Draw Site, Luna County, New Mexico. In *Patterns in Transition: Papers from the 16th Biennial Jornada Mogollon Conference*, edited by Melinda R. Landreth, pp. 29–64. El Paso Museum of Archaeology, El Paso, Texas.
- Riley, Carroll L.
2005 *Becoming Aztlan: Mesoamerican Influence in the Greater Southwest, AD 1200–1500*. University of Utah Press, Salt Lake City.
- Sackett, James R.
1985 Style and Ethnicity in the Kalahari: A Reply to Wiessner. *American Antiquity* 50:154–159.
- Sauer, Carl O., and Donald Brand
1931 Prehistoric Settlements of Sonora, with Special References to Cerro de Trincheras. In *University of California Publications in Geography*, edited by Carl O. Sauer and J. B. Leighly, pp. 67–148. University of California Press, Berkeley.
- Seymour, Deni J.
2016 Defining the Jcome and their “Gifts of Little Value.” *Kiva* 82:137–173.
- Skibo, James M., and William H. Walker
2002 Ball Courts and Ritual Performance. In *The Joyce*

- Well Site*, edited by James M. Skibo, Eugene B. McCluney, and William H. Walker, pp. 107–128. University of Utah Press, Salt Lake City.
- Stark, Miriam T.
1998 Technical Choice and Social Boundaries in Material Culture Patterning: An Introduction. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 1–11. Smithsonian Institution, Washington, DC.
- VanPool, Christine S.
2009 The Signs of the Sacred: Identifying Shamans Using Archaeological Evidence. *Journal of Anthropological Archaeology* 28:177–190.
- VanPool, Christine S., and Todd L. VanPool
2007 *Signs of the Casas Grandes Shamans*. University of Utah Press, Salt Lake City.
2015 Religion and Cosmology in the Casas Grandes World. In *Ancient Paquimé and the Casas Grandes World*, edited by Paul E. Minnis and Michael E. Whalen, pp. 83–102. University of Arizona Press, Tucson.
- VanPool, Todd L., and Christine S. VanPool
2018 Visiting the Horned Serpent's Home: A Relational Analysis of Paquimé as a Pilgrimage Site in the North American Southwest. *Journal of Social Archaeology* 18:306–324.
2020 Paquimé's Appeal: The Creation of an Elite Pilgrimage Site in the North American Southwest. In *Cognitive Archaeology: Mind, Ethnography, and the Past in South Africa and Beyond*, edited by David S. Whitley, Johannes H. N. Loubser, and Gavin Whitelaw, pp. 115–134. Routledge, London.
- Wenger, Etienne
1998 *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press, Cambridge.
- Whalen, Michael E., and Paul E. Minnis
2001a *Casas Grandes and Its Hinterland: Prehistoric Regional Organization in Northwest Mexico*. University of Arizona Press, Tucson.
2001b Architecture and Authority in the Casas Grandes Region, Chihuahua, Mexico. *American Antiquity* 66:651–699.
2009 *The Neighbors of Casas Grandes: Excavating Medio Period Communities of Northwest Chihuahua, Mexico*. University of Arizona Press, Tucson.
2012 Ceramics and Polity in the Casas Grandes Area, Chihuahua, Mexico. *American Antiquity* 77:403–423.
- Woosley, Anne I., and Bart Olinger
1993 The Casas Grandes Ceramic Tradition: Production and Interregional Exchange of Ramos Polychrome. In *Culture and Contact: Charles C. Di Peso's Gran Chichimeca*, edited by Anne I. Woosley and John C. Ravesloot, pp. 105–132. Amerind Foundation New World Studies Series No. 2. University of New Mexico Press, Albuquerque.
- Yetman, David
2010 *The Ópatas: In Search of a Sonoran people*. University of Arizona Press, Tucson.

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